

```
SetDirectory["C:/drorbn/AcademicPensieve/Projects/Arrow_Diagrams_and_gl(N)"];
<< "Arrow_Diagrams_and_gl(N).m"
```

se[1,i,j] stands for Aij;  
 se[2,i,j] stands for Bij;  
 se[3,i,j] stands for Dij.

Commutation relations come from <http://katlas.math.toronto.edu/drorbn/bbs/show?shot=Leung-090227-132523.jpg>

```
sbase = 10;
sij[salpha_Integer] := IntegerDigits[salpha, sbase, 3];
salpha[{t_, i_, j_}] := sbase^2*t + sbase*i + j;
salpha[t_, i_, j_] := sbase^2*t + sbase*i + j;
b[se[salpha1_], se[salpha2_]] := b[se[salpha1], se[salpha2]] = Module[
  {d, t1, t2, i, j, k, l, s = 1},
  d[i_, j_] := If[i == j, 1, 0];
  {t1, i, j} = sij[salpha1];
  {t2, k, l} = sij[salpha2];
  If[t2 < t1, s = -1; {{t1, i, j}, {t2, k, l}} = {{t2, k, l}, {t1, i, j}}];
  {
    {
      d[j, k] se[1, i, l] - d[i, l] se[1, k, j],
      d[j, k] se[2, i, l] - d[j, l] se[2, i, k],
      d[i, k] se[3, l, j] + d[l, i] se[3, j, k]
    },
    {
      Null,
      0,
      d[j, l] se[1, i, k] + d[i, k] se[1, j, l] - d[j, k] se[1, i, l] - d[i, l] se[1, j, k]
    },
    {
      Null,
      Null,
      0
    }
  }
  ][[t1, t2]] /. {
se[2 | 3, i_, i_] -> 0,
se[2, i_, j_] /; i > j -> -se[2, j, i],
se[3, i_, j_] /; i > j -> -se[3, j, i]
} /. se[tij_] -> s * se[salpha[tij]]
];
(a_Plus) **w_RSW := (#**w) & /@ a;
se[alpha_] ** (a_Plus) := (se[alpha] ** #) & /@ a;
```

```

(c_*se[alpha_])**w_RSW := Expand[c*(se[alpha]**w)];
se[alpha_]** (c_*w_RSW) := Expand[c*(se[alpha]**w)];
se[alpha_]**RSW[] := RSW[alpha];
se[alpha_]**RSW[beta_, rest___] /; alpha <= beta := RSW[alpha, beta, rest];
se[alpha_]**RSW[beta_, rest___] /; alpha > beta := Plus[
  se[beta]**(se[alpha]**RSW[rest]),
  b[se[alpha], se[beta]]**RSW[rest]
];

Clear[USO];
USO[diag_Diag] := Module[
  {allterms, s, LTAT, BDAT, EQAT, CAT, m1, m2, dirs, coeff, k, ltpairs, w, allots},
  allterms = List@@Expand[(Times@@diag)/.ar[p_,q_] =>
    LTAT[p,q] + BDAT[p,q] + 1/2 (EQAT[p,q] - CAT[p] + CAT[q] - CAT[])
  ];
  s = Sum[
    dirs = allterms[[m1]]; (* "dirs" is "directions" *)
    coeff = dirs /. {_CAT | _EQAT | _LTAT | _BDAT} -> 1;
    k = 0;
    w = Table[1, {2 Length[diag]}];
    ltpairs = {};
    dirs /. {
      LTAT[p_, q_] => (
        w[[p]] = se[1, i = ++k, j = ++k];
        w[[q]] = se[1, j, i];
        AppendTo[ltpairs, {i, j}];
      ),
      BDAT[p_, q_] => (
        w[[p]] = se[2, i = ++k, j = ++k];
        w[[q]] = se[3, i, j];
        AppendTo[ltpairs, {i, j}];
      ),
      EQAT[p_, q_] => (w[[p]] = w[[q]] = se[1, i = ++k, i];),
      CAT[p_] => (
        w[[p]] = se[1, i = ++k, i];
        coeff *= h[i];
      ),
      CAT[] => (coeff *= h[++k]^2);
    };
  w = DeleteCases[w, 1];
  allots = OrderTypes[k, ltpairs];
  Sum[

```

```

ot = allots[[m2]];
Times[
  n^Max[ot],
  coeff /. h[i_] => h[ot[[i]]],
  SW@@w /. se[t_, i_, j_] => salpha[t, ot[[i]], ot[[j]]]
],
{m2, Length[allots]}
], {m1, Length[allterms]}
];
If[Length[diag] ≤ 3,
  USO[diag] = CanonicalForm[Expand[s]],
  CanonicalForm[Expand[s]]
]
];
USO[expr_] := Expand[expr /. diag_Diag => USO[diag]];

```

---

## Testing

```

bb[spe1_, spe2_, spe3_] := Expand[b[spe1, spe2] /. spe0_spe => b[spe0, spe3]];
Jac[spe1_, spe2_, spe3_] :=
  bb[spe1, spe2, spe3] + bb[spe2, spe3, spe1] + bb[spe3, spe1, spe2]

b[spe[111], spe[112]]

spe[112]

bb[spe[111], spe[112], spe[112]]

0

Jac[spe[111], spe[114], spe[214]]

0

Jac[spe[213], spe[321], spe[113]]

0

Union[Flatten[Outer[
  (Jac[
    spe[spalpha[#1[[1]], #2[[1]], #2[[2]]],
    spe[spalpha[#1[[2]], #2[[3]], #2[[4]]],
    spe[spalpha[#1[[3]], #2[[5]], #2[[6]]]
  ] *
  J[
    spe[spalpha[#1[[1]], #2[[1]], #2[[2]]],
    spe[spalpha[#1[[2]], #2[[3]], #2[[4]]],
    spe[spalpha[#1[[3]], #2[[5]], #2[[6]]]
  ]) &,
  OrderTypes[3], OrderTypes[6], 1
]]]
{0}

```

```
{s1, s2, s3} = {se[111], se[313], se[223]}
```

```
{se[111], se[313], se[223]}
```

```
Jac[s1, s2, s3]
```

```
0
```

```
b[s1, s2]
```

```
-se[313]
```

```
Diagrams[2 ar]
```

```
{Diag[ar[1, 2], ar[3, 4]], Diag[ar[1, 2], ar[4, 3]], Diag[ar[2, 1], ar[3, 4]],  
Diag[ar[2, 1], ar[4, 3]], Diag[ar[1, 3], ar[2, 4]], Diag[ar[1, 3], ar[4, 2]],  
Diag[ar[2, 4], ar[3, 1]], Diag[ar[3, 1], ar[4, 2]], Diag[ar[1, 4], ar[2, 3]],  
Diag[ar[1, 4], ar[3, 2]], Diag[ar[2, 3], ar[4, 1]], Diag[ar[3, 2], ar[4, 1]]}
```

```
USp[Diag[ar[1, 2]]]
```

```
{7, 5}
```

$$-\frac{1}{2} n h[1]^2 \text{RSpW}[] + \frac{1}{2} n \text{RSpW}[111, 111] + n^2 \text{RSpW}[112, 121] + 2 n \text{RSpW}[211, 311] + n^2 \text{RSpW}[212, 312]$$

```
lc = R[Diag[R6T[1, 2, 3]]]
```

```
Diag[ar[1, 2], ar[3, 4]] + Diag[ar[1, 3], ar[2, 4]] - 2 Diag[ar[1, 4], ar[2, 3]]
```

```
USp[lc]
```

```
{225, 97}
```

```
{225, 93}
```

```
{225, 94}
```

```
0
```

```
USp[Take[R/@Diagrams[1 ar + R6T], 2]]
```

```
Computing OrderTypes [6, {{1, 2}, {3, 4}, {5, 6}}]
```

```
Computing OrderTypes [6, {{3, 4}, {5, 6}}]
```

```
Computing OrderTypes [6, {{5, 6}}]
```

```
Computing OrderTypes [5, {{1, 2}, {3, 4}}]
```

```
Computing OrderTypes [5, {{3, 4}}]
```

```
Computing OrderTypes [4, {{1, 2}}]
```

```
Computing OrderTypes [5, {{1, 2}, {4, 5}}]
```

```
Computing OrderTypes [5, {{4, 5}}]
```

```
Computing OrderTypes [5, {{2, 3}, {4, 5}}]
```

```
{15 319, 2875}
```

```
{15 319, 2851}
```

```
{15 319, 2872}
```

```
{15 319, 4509}
```

```
{15 319, 4512}
```

```
{0, 0}
```

```
USp[R[Diagrams [2 ar + R6T] [[23]]]]
```

```

Computing OrderTypes [8, {{1, 2}, {3, 4}, {5, 6}, {7, 8}}]
Computing OrderTypes [8, {{3, 4}, {5, 6}, {7, 8}}]
Computing OrderTypes [8, {{5, 6}, {7, 8}}]
Computing OrderTypes [8, {{7, 8}}]
Computing OrderTypes [7, {{1, 2}, {3, 4}, {5, 6}}]
Computing OrderTypes [7, {{3, 4}, {5, 6}}]
Computing OrderTypes [7, {{5, 6}}]
Computing OrderTypes [6, {{1, 2}, {3, 4}}]
Computing OrderTypes [6, {{3, 4}}]
Computing OrderTypes [5, {{1, 2}}]
Computing OrderTypes [5, {{1, 2}, {3, 4}}]
Computing OrderTypes [5, {{3, 4}}]
Computing OrderTypes [4, {{1, 2}}]
Computing OrderTypes [3, {{1, 2}}]
Computing OrderTypes [7, {{1, 2}, {3, 4}, {6, 7}}]
Computing OrderTypes [7, {{3, 4}, {6, 7}}]
Computing OrderTypes [7, {{6, 7}}]
Computing OrderTypes [6, {{1, 2}, {5, 6}}]
Computing OrderTypes [6, {{5, 6}}]
Computing OrderTypes [5, {{4, 5}}]
Computing OrderTypes [5, {{1, 2}, {4, 5}}]
Computing OrderTypes [4, {{3, 4}}]
Computing OrderTypes [3, {{2, 3}}]
Computing OrderTypes [7, {{1, 2}, {4, 5}, {6, 7}}]
Computing OrderTypes [7, {{4, 5}, {6, 7}}]
Computing OrderTypes [6, {{3, 4}, {5, 6}}]
Computing OrderTypes [5, {{2, 3}, {4, 5}}]

```

\$Aborted

**l = Length[rels = R /@ Diagrams [1 ar + R6T]]**

120

```
USO[List @@ rels[[1]]]
```

A very large output was generated. Here is a sample of it:

$$\left\{ -\frac{1}{8} n h[1]^2 \text{RSW}[] + \frac{3}{8} n h[1]^2 \text{RSW}[111, 111] + \frac{3}{8} n^2 h[2]^2 \text{RSW}[111, 111] + \ll 2842 \gg + \right.$$

$$6 n^6 \text{RSW}[215, 224, 236, 315, 324, 336] + 6 n^5 \text{RSW}[215, 225, 234, 315, 325, 334] +$$

$$6 n^6 \text{RSW}[215, 226, 234, 315, 326, 334] + 6 n^6 \text{RSW}[216, 223, 245, 316, 323, 345] +$$

$$6 n^6 \text{RSW}[216, 224, 235, 316, 324, 335] + 6 n^6 \text{RSW}[216, 225, 234, 316, 325, 334],$$

$$\left. -\frac{1}{8} n h[1]^2 \text{RSW}[] + \ll 2829 \gg + 6 n^6 \text{RSW}[216, 225, 234, 316, 325, 334], \ll 1 \gg \right\}$$
[Show Less](#)
[Show More](#)
[Show Full Output](#)
[Set Size Limit...](#)

```
Total[USO[List @@ rels[[1]]]]
```

```
0
```

```
Table[
```

```
Print[{{ind, rels[[ind]], usp = USp[rels[[ind]]}];
```

```
usp,
```

```
{ind, 1}
```

```
]
```

```
Computing OrderTypes[6, {{1, 2}, {3, 4}, {5, 6}}]
```

```
{15 319, 2875}
```

```
{15 319, 2851}
```

```
{15 319, 2872}
```

```
{1, Diag[ar[1, 2], ar[3, 4], ar[5, 6]] +  
Diag[ar[1, 2], ar[3, 5], ar[4, 6]] - 2 Diag[ar[1, 2], ar[3, 6], ar[4, 5]], 0}
```

```
{15 319, 4509}
```

```
{15 319, 4512}
```

```
{2, Diag[ar[1, 2], ar[3, 4], ar[6, 5]] - Diag[ar[1, 2], ar[3, 5], ar[4, 6]] +  
Diag[ar[1, 2], ar[3, 6], ar[4, 5]] - Diag[ar[1, 2], ar[3, 6], ar[5, 4]], 0}
```

```
{15 319, 4509}
```

```
{3, -Diag[ar[1, 2], ar[3, 5], ar[4, 6]] + Diag[ar[1, 2], ar[3, 6], ar[4, 5]] -  
Diag[ar[1, 2], ar[3, 6], ar[5, 4]] + Diag[ar[1, 2], ar[4, 3], ar[5, 6]], 0}
```

```
{15 319, 4570}
```

```
{15 319, 4864}
```

```
{15 319, 4873}
```

```
{4, -Diag[ar[1, 2], ar[4, 3], ar[5, 6]] + Diag[ar[1, 2], ar[4, 5], ar[6, 3]] +  
Diag[ar[1, 2], ar[5, 3], ar[6, 4]] - Diag[ar[1, 2], ar[5, 4], ar[6, 3]], 0}
```

```
{5, -Diag[ar[1, 2], ar[3, 4], ar[6, 5]] + Diag[ar[1, 2], ar[4, 5], ar[6, 3]] +  
Diag[ar[1, 2], ar[5, 3], ar[6, 4]] - Diag[ar[1, 2], ar[5, 4], ar[6, 3]], 0}
```

```
{15 319, 4818}
```

```
{6, -Diag[ar[1, 2], ar[4, 3], ar[6, 5]] -  
Diag[ar[1, 2], ar[5, 3], ar[6, 4]] + 2 Diag[ar[1, 2], ar[5, 4], ar[6, 3]], 0}
```

```

{15 319, 4509}

{15 319, 4484}

{15 319, 4479}

{7, Diag[ar[2, 1], ar[3, 4], ar[5, 6]] +
  Diag[ar[2, 1], ar[3, 5], ar[4, 6]] - 2 Diag[ar[2, 1], ar[3, 6], ar[4, 5]], 0}

{15 319, 4818}

{15 319, 4824}

{8, Diag[ar[2, 1], ar[3, 4], ar[6, 5]] - Diag[ar[2, 1], ar[3, 5], ar[4, 6]] +
  Diag[ar[2, 1], ar[3, 6], ar[4, 5]] - Diag[ar[2, 1], ar[3, 6], ar[5, 4]], 0}

{15 319, 4818}

{9, -Diag[ar[2, 1], ar[3, 5], ar[4, 6]] + Diag[ar[2, 1], ar[3, 6], ar[4, 5]] -
  Diag[ar[2, 1], ar[3, 6], ar[5, 4]] + Diag[ar[2, 1], ar[4, 3], ar[5, 6]], 0}

{15 319, 4903}

{15 319, 4904}

{15 319, 4915}

{10, -Diag[ar[2, 1], ar[4, 3], ar[5, 6]] + Diag[ar[2, 1], ar[4, 5], ar[6, 3]] +
  Diag[ar[2, 1], ar[5, 3], ar[6, 4]] - Diag[ar[2, 1], ar[5, 4], ar[6, 3]], 0}

{11, -Diag[ar[2, 1], ar[3, 4], ar[6, 5]] + Diag[ar[2, 1], ar[4, 5], ar[6, 3]] +
  Diag[ar[2, 1], ar[5, 3], ar[6, 4]] - Diag[ar[2, 1], ar[5, 4], ar[6, 3]], 0}

{15 319, 4858}

{12, -Diag[ar[2, 1], ar[4, 3], ar[6, 5]] -
  Diag[ar[2, 1], ar[5, 3], ar[6, 4]] + 2 Diag[ar[2, 1], ar[5, 4], ar[6, 3]], 0}

{15 319, 2851}

{15 319, 2780}

{15 319, 2866}

{15 319, 2909}

{13, Diag[ar[1, 3], ar[2, 4], ar[5, 6]] - Diag[ar[1, 3], ar[2, 6], ar[4, 5]] +
  Diag[ar[1, 4], ar[2, 5], ar[3, 6]] - Diag[ar[1, 4], ar[2, 6], ar[3, 5]], 0}

{15 319, 4484}

{15 319, 4497}

{14, Diag[ar[1, 3], ar[2, 4], ar[6, 5]] - Diag[ar[1, 3], ar[2, 6], ar[5, 4]] -
  Diag[ar[1, 4], ar[2, 5], ar[3, 6]] + Diag[ar[1, 4], ar[2, 6], ar[3, 5]], 0}

{15 319, 2895}

{15 319, 4645}

{15 319, 4608}

{15 319, 4651}

{15 319, 4593}

```



$$\{15, -\text{Diag}[\text{ar}[1, 3], \text{ar}[2, 5], \text{ar}[4, 6]] + \text{Diag}[\text{ar}[1, 3], \text{ar}[2, 6], \text{ar}[4, 5]] + \text{Diag}[\text{ar}[1, 3], \text{ar}[4, 2], \text{ar}[5, 6]] - \text{Diag}[\text{ar}[1, 3], \text{ar}[4, 6], \text{ar}[5, 2]] - \text{Diag}[\text{ar}[1, 4], \text{ar}[2, 6], \text{ar}[5, 3]] + \text{Diag}[\text{ar}[1, 4], \text{ar}[3, 6], \text{ar}[5, 2]], 0\}$$

{15 319, 4737}

{15 319, 5071}

{15 319, 5098}

$$\{16, -\text{Diag}[\text{ar}[1, 3], \text{ar}[4, 2], \text{ar}[5, 6]] + \text{Diag}[\text{ar}[1, 3], \text{ar}[4, 5], \text{ar}[6, 2]] + \text{Diag}[\text{ar}[1, 4], \text{ar}[5, 2], \text{ar}[6, 3]] - \text{Diag}[\text{ar}[1, 4], \text{ar}[5, 3], \text{ar}[6, 2]], 0\}$$

{15 319, 4688}

{15 319, 5061}

{15 319, 5040}

{15 319, 4683}

{15 319, 4745}

$$\{17, -\text{Diag}[\text{ar}[1, 3], \text{ar}[2, 4], \text{ar}[6, 5]] + \text{Diag}[\text{ar}[1, 3], \text{ar}[2, 5], \text{ar}[6, 4]] + \text{Diag}[\text{ar}[1, 3], \text{ar}[5, 2], \text{ar}[6, 4]] - \text{Diag}[\text{ar}[1, 3], \text{ar}[5, 4], \text{ar}[6, 2]] - \text{Diag}[\text{ar}[1, 4], \text{ar}[2, 5], \text{ar}[6, 3]] + \text{Diag}[\text{ar}[1, 4], \text{ar}[3, 5], \text{ar}[6, 2]], 0\}$$

{15 319, 5003}

$$\{18, -\text{Diag}[\text{ar}[1, 3], \text{ar}[4, 2], \text{ar}[6, 5]] + \text{Diag}[\text{ar}[1, 3], \text{ar}[5, 4], \text{ar}[6, 2]] - \text{Diag}[\text{ar}[1, 4], \text{ar}[5, 2], \text{ar}[6, 3]] + \text{Diag}[\text{ar}[1, 4], \text{ar}[5, 3], \text{ar}[6, 2]], 0\}$$

{15 319, 4645}

{15 319, 4681}

{15 319, 4611}

{15 319, 4687}

$$\{19, \text{Diag}[\text{ar}[2, 4], \text{ar}[3, 1], \text{ar}[5, 6]] + \text{Diag}[\text{ar}[2, 5], \text{ar}[3, 6], \text{ar}[4, 1]] - \text{Diag}[\text{ar}[2, 6], \text{ar}[3, 1], \text{ar}[4, 5]] - \text{Diag}[\text{ar}[2, 6], \text{ar}[3, 5], \text{ar}[4, 1]], 0\}$$

{15 319, 5003}

{15 319, 5019}

$$\{20, \text{Diag}[\text{ar}[2, 4], \text{ar}[3, 1], \text{ar}[6, 5]] - \text{Diag}[\text{ar}[2, 5], \text{ar}[3, 6], \text{ar}[4, 1]] - \text{Diag}[\text{ar}[2, 6], \text{ar}[3, 1], \text{ar}[5, 4]] + \text{Diag}[\text{ar}[2, 6], \text{ar}[3, 5], \text{ar}[4, 1]], 0\}$$

{15 319, 4687}

{15 319, 5049}

{15 319, 4864}

{15 319, 5062}

{15 319, 5069}

$$\{21, -\text{Diag}[\text{ar}[2, 5], \text{ar}[3, 1], \text{ar}[4, 6]] + \text{Diag}[\text{ar}[2, 6], \text{ar}[3, 1], \text{ar}[4, 5]] - \text{Diag}[\text{ar}[2, 6], \text{ar}[4, 1], \text{ar}[5, 3]] + \text{Diag}[\text{ar}[3, 1], \text{ar}[4, 2], \text{ar}[5, 6]] - \text{Diag}[\text{ar}[3, 1], \text{ar}[4, 6], \text{ar}[5, 2]] + \text{Diag}[\text{ar}[3, 6], \text{ar}[4, 1], \text{ar}[5, 2]], 0\}$$

{15 319, 4934}

{15 319, 4927}

```

{15 319, 4996}

{22, -Diag[ar[3, 1], ar[4, 2], ar[5, 6]] + Diag[ar[3, 1], ar[4, 5], ar[6, 2]] +
  Diag[ar[4, 1], ar[5, 2], ar[6, 3]] - Diag[ar[4, 1], ar[5, 3], ar[6, 2]], 0}

{15 319, 4931}

{15 319, 4971}

{15 319, 4966}

{15 319, 4861}

{15 319, 5092}

{23, -Diag[ar[2, 4], ar[3, 1], ar[6, 5]] + Diag[ar[2, 5], ar[3, 1], ar[6, 4]] -
  Diag[ar[2, 5], ar[4, 1], ar[6, 3]] + Diag[ar[3, 1], ar[5, 2], ar[6, 4]] -
  Diag[ar[3, 1], ar[5, 4], ar[6, 2]] + Diag[ar[3, 5], ar[4, 1], ar[6, 2]], 0}

{15 319, 4904}

{24, -Diag[ar[3, 1], ar[4, 2], ar[6, 5]] + Diag[ar[3, 1], ar[5, 4], ar[6, 2]] -
  Diag[ar[4, 1], ar[5, 2], ar[6, 3]] + Diag[ar[4, 1], ar[5, 3], ar[6, 2]], 0}

{15 319, 2785}

{15 319, 2857}

{25, Diag[ar[1, 4], ar[2, 5], ar[3, 6]] - Diag[ar[1, 4], ar[2, 6], ar[3, 5]] +
  Diag[ar[1, 5], ar[2, 3], ar[4, 6]] - Diag[ar[1, 5], ar[2, 6], ar[3, 4]], 0}

{15 319, 4615}

{15 319, 2910}

{15 319, 4690}

{26, Diag[ar[1, 4], ar[2, 5], ar[6, 3]] - Diag[ar[1, 4], ar[2, 6], ar[5, 3]] +
  Diag[ar[1, 5], ar[2, 3], ar[6, 4]] - Diag[ar[1, 5], ar[2, 4], ar[3, 6]] -
  Diag[ar[1, 5], ar[2, 4], ar[6, 3]] + Diag[ar[1, 5], ar[2, 6], ar[3, 4]], 0}

{15 319, 4486}

{15 319, 4497}

{27, -Diag[ar[1, 4], ar[2, 5], ar[3, 6]] + Diag[ar[1, 4], ar[2, 6], ar[3, 5]] -
  Diag[ar[1, 5], ar[2, 6], ar[4, 3]] + Diag[ar[1, 5], ar[3, 2], ar[4, 6]], 0}

{15 319, 4650}

{15 319, 5052}

{15 319, 5056}

{28, Diag[ar[1, 4], ar[3, 5], ar[6, 2]] - Diag[ar[1, 4], ar[3, 6], ar[5, 2]] -
  Diag[ar[1, 5], ar[3, 2], ar[4, 6]] + Diag[ar[1, 5], ar[3, 6], ar[4, 2]] +
  Diag[ar[1, 5], ar[4, 2], ar[6, 3]] - Diag[ar[1, 5], ar[4, 3], ar[6, 2]], 0}

{15 319, 4736}

{29, Diag[ar[1, 4], ar[5, 2], ar[6, 3]] - Diag[ar[1, 4], ar[5, 3], ar[6, 2]] -
  Diag[ar[1, 5], ar[2, 3], ar[6, 4]] + Diag[ar[1, 5], ar[3, 4], ar[6, 2]], 0}

{15 319, 5021}

{30, -Diag[ar[1, 4], ar[5, 2], ar[6, 3]] + Diag[ar[1, 4], ar[5, 3], ar[6, 2]] -
  Diag[ar[1, 5], ar[3, 2], ar[6, 4]] + Diag[ar[1, 5], ar[4, 3], ar[6, 2]], 0}

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{15 319, 4733}

{15 319, 4732}

{31, Diag[ar[2, 3], ar[4, 6], ar[5, 1]] + Diag[ar[2, 5], ar[3, 6], ar[4, 1]] -
  Diag[ar[2, 6], ar[3, 4], ar[5, 1]] - Diag[ar[2, 6], ar[3, 5], ar[4, 1]], 0}

{15 319, 4932}

{15 319, 4744}

{15 319, 5093}

{32, Diag[ar[2, 3], ar[5, 1], ar[6, 4]] - Diag[ar[2, 4], ar[3, 6], ar[5, 1]] -
  Diag[ar[2, 4], ar[5, 1], ar[6, 3]] + Diag[ar[2, 5], ar[4, 1], ar[6, 3]] +
  Diag[ar[2, 6], ar[3, 4], ar[5, 1]] - Diag[ar[2, 6], ar[4, 1], ar[5, 3]], 0}

{15 319, 5056}

{15 319, 5039}

{33, -Diag[ar[2, 5], ar[3, 6], ar[4, 1]] + Diag[ar[2, 6], ar[3, 5], ar[4, 1]] -
  Diag[ar[2, 6], ar[4, 3], ar[5, 1]] + Diag[ar[3, 2], ar[4, 6], ar[5, 1]], 0}

{15 319, 5103}

{15 319, 4996}

{15 319, 4921}

{34, -Diag[ar[3, 2], ar[4, 6], ar[5, 1]] + Diag[ar[3, 5], ar[4, 1], ar[6, 2]] -
  Diag[ar[3, 6], ar[4, 1], ar[5, 2]] + Diag[ar[3, 6], ar[4, 2], ar[5, 1]] +
  Diag[ar[4, 2], ar[5, 1], ar[6, 3]] - Diag[ar[4, 3], ar[5, 1], ar[6, 2]], 0}

{15 319, 4859}

{35, -Diag[ar[2, 3], ar[5, 1], ar[6, 4]] + Diag[ar[3, 4], ar[5, 1], ar[6, 2]] +
  Diag[ar[4, 1], ar[5, 2], ar[6, 3]] - Diag[ar[4, 1], ar[5, 3], ar[6, 2]], 0}

{15 319, 4866}

{36, -Diag[ar[3, 2], ar[5, 1], ar[6, 4]] - Diag[ar[4, 1], ar[5, 2], ar[6, 3]] +
  Diag[ar[4, 1], ar[5, 3], ar[6, 2]] + Diag[ar[4, 3], ar[5, 1], ar[6, 2]], 0}

{15 319, 2849}

{15 319, 2840}

{15 319, 2755}

{37, Diag[ar[1, 6], ar[2, 3], ar[4, 5]] +
  Diag[ar[1, 6], ar[2, 4], ar[3, 5]] - 2 Diag[ar[1, 6], ar[2, 5], ar[3, 4]], 0}

{15 319, 4483}

{15 319, 4483}

{38, Diag[ar[1, 6], ar[2, 3], ar[5, 4]] - Diag[ar[1, 6], ar[2, 4], ar[3, 5]] +
  Diag[ar[1, 6], ar[2, 5], ar[3, 4]] - Diag[ar[1, 6], ar[2, 5], ar[4, 3]], 0}

{15 319, 4483}

{39, -Diag[ar[1, 6], ar[2, 4], ar[3, 5]] + Diag[ar[1, 6], ar[2, 5], ar[3, 4]] -
  Diag[ar[1, 6], ar[2, 5], ar[4, 3]] + Diag[ar[1, 6], ar[3, 2], ar[4, 5]], 0}

{15 319, 4572}

{15 319, 4879}

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{15 319, 4881}

{40, -Diag[ar[1, 6], ar[3, 2], ar[4, 5]] + Diag[ar[1, 6], ar[3, 4], ar[5, 2]] +
  Diag[ar[1, 6], ar[4, 2], ar[5, 3]] - Diag[ar[1, 6], ar[4, 3], ar[5, 2]], 0}

{41, -Diag[ar[1, 6], ar[2, 3], ar[5, 4]] + Diag[ar[1, 6], ar[3, 4], ar[5, 2]] +
  Diag[ar[1, 6], ar[4, 2], ar[5, 3]] - Diag[ar[1, 6], ar[4, 3], ar[5, 2]], 0}

{15 319, 4823}

{42, -Diag[ar[1, 6], ar[3, 2], ar[5, 4]] -
  Diag[ar[1, 6], ar[4, 2], ar[5, 3]] + 2 Diag[ar[1, 6], ar[4, 3], ar[5, 2]], 0}

{15 319, 4579}

{15 319, 4577}

{15 319, 4592}

{43, Diag[ar[2, 3], ar[4, 5], ar[6, 1]] +
  Diag[ar[2, 4], ar[3, 5], ar[6, 1]] - 2 Diag[ar[2, 5], ar[3, 4], ar[6, 1]], 0}

{15 319, 4845}

{15 319, 4859}

{44, Diag[ar[2, 3], ar[5, 4], ar[6, 1]] - Diag[ar[2, 4], ar[3, 5], ar[6, 1]] +
  Diag[ar[2, 5], ar[3, 4], ar[6, 1]] - Diag[ar[2, 5], ar[4, 3], ar[6, 1]], 0}

{15 319, 4845}

{45, -Diag[ar[2, 4], ar[3, 5], ar[6, 1]] + Diag[ar[2, 5], ar[3, 4], ar[6, 1]] -
  Diag[ar[2, 5], ar[4, 3], ar[6, 1]] + Diag[ar[3, 2], ar[4, 5], ar[6, 1]], 0}

{15 319, 4914}

{15 319, 4921}

{15 319, 4838}

{46, -Diag[ar[3, 2], ar[4, 5], ar[6, 1]] + Diag[ar[3, 4], ar[5, 2], ar[6, 1]] +
  Diag[ar[4, 2], ar[5, 3], ar[6, 1]] - Diag[ar[4, 3], ar[5, 2], ar[6, 1]], 0}

{47, -Diag[ar[2, 3], ar[5, 4], ar[6, 1]] + Diag[ar[3, 4], ar[5, 2], ar[6, 1]] +
  Diag[ar[4, 2], ar[5, 3], ar[6, 1]] - Diag[ar[4, 3], ar[5, 2], ar[6, 1]], 0}

{15 319, 4911}

{48, -Diag[ar[3, 2], ar[5, 4], ar[6, 1]] -
  Diag[ar[4, 2], ar[5, 3], ar[6, 1]] + 2 Diag[ar[4, 3], ar[5, 2], ar[6, 1]], 0}

{15 319, 2872}

{49, Diag[ar[1, 2], ar[3, 4], ar[5, 6]] +
  Diag[ar[1, 3], ar[2, 4], ar[5, 6]] - 2 Diag[ar[1, 4], ar[2, 3], ar[5, 6]], 0}

{15 319, 4479}

{50, Diag[ar[1, 2], ar[3, 4], ar[6, 5]] +
  Diag[ar[1, 3], ar[2, 4], ar[6, 5]] - 2 Diag[ar[1, 4], ar[2, 3], ar[6, 5]], 0}

{15 319, 4512}

{51, Diag[ar[1, 2], ar[4, 3], ar[5, 6]] - Diag[ar[1, 3], ar[2, 4], ar[5, 6]] +
  Diag[ar[1, 4], ar[2, 3], ar[5, 6]] - Diag[ar[1, 4], ar[3, 2], ar[5, 6]], 0}

{15 319, 4824}

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{52, Diag[ar[1, 2], ar[4, 3], ar[6, 5]] - Diag[ar[1, 3], ar[2, 4], ar[6, 5]] +
  Diag[ar[1, 4], ar[2, 3], ar[6, 5]] - Diag[ar[1, 4], ar[3, 2], ar[6, 5]], 0}
{53, -Diag[ar[1, 3], ar[2, 4], ar[5, 6]] + Diag[ar[1, 4], ar[2, 3], ar[5, 6]] -
  Diag[ar[1, 4], ar[3, 2], ar[5, 6]] + Diag[ar[2, 1], ar[3, 4], ar[5, 6]], 0}
{54, -Diag[ar[1, 3], ar[2, 4], ar[6, 5]] + Diag[ar[1, 4], ar[2, 3], ar[6, 5]] -
  Diag[ar[1, 4], ar[3, 2], ar[6, 5]] + Diag[ar[2, 1], ar[3, 4], ar[6, 5]], 0}
{15 319, 4570}
{15 319, 4873}
{55, -Diag[ar[2, 1], ar[3, 4], ar[5, 6]] + Diag[ar[2, 3], ar[4, 1], ar[5, 6]] +
  Diag[ar[3, 1], ar[4, 2], ar[5, 6]] - Diag[ar[3, 2], ar[4, 1], ar[5, 6]], 0}
{15 319, 4903}
{15 319, 4915}
{56, -Diag[ar[2, 1], ar[3, 4], ar[6, 5]] + Diag[ar[2, 3], ar[4, 1], ar[6, 5]] +
  Diag[ar[3, 1], ar[4, 2], ar[6, 5]] - Diag[ar[3, 2], ar[4, 1], ar[6, 5]], 0}
{57, -Diag[ar[1, 2], ar[4, 3], ar[5, 6]] + Diag[ar[2, 3], ar[4, 1], ar[5, 6]] +
  Diag[ar[3, 1], ar[4, 2], ar[5, 6]] - Diag[ar[3, 2], ar[4, 1], ar[5, 6]], 0}
{58, -Diag[ar[1, 2], ar[4, 3], ar[6, 5]] + Diag[ar[2, 3], ar[4, 1], ar[6, 5]] +
  Diag[ar[3, 1], ar[4, 2], ar[6, 5]] - Diag[ar[3, 2], ar[4, 1], ar[6, 5]], 0}
{59, -Diag[ar[2, 1], ar[4, 3], ar[5, 6]] -
  Diag[ar[3, 1], ar[4, 2], ar[5, 6]] + 2 Diag[ar[3, 2], ar[4, 1], ar[5, 6]], 0}
{60, -Diag[ar[2, 1], ar[4, 3], ar[6, 5]] -
  Diag[ar[3, 1], ar[4, 2], ar[6, 5]] + 2 Diag[ar[3, 2], ar[4, 1], ar[6, 5]], 0}
{61, Diag[ar[1, 2], ar[3, 5], ar[4, 6]] + Diag[ar[1, 4], ar[2, 5], ar[3, 6]] -
  Diag[ar[1, 5], ar[2, 3], ar[4, 6]] - Diag[ar[1, 5], ar[2, 4], ar[3, 6]], 0}
{15 319, 4645}
{62, Diag[ar[1, 2], ar[3, 5], ar[6, 4]] + Diag[ar[1, 4], ar[2, 5], ar[6, 3]] -
  Diag[ar[1, 5], ar[2, 3], ar[6, 4]] - Diag[ar[1, 5], ar[2, 4], ar[6, 3]], 0}
{15 319, 4645}
{63, Diag[ar[1, 2], ar[4, 6], ar[5, 3]] - Diag[ar[1, 3], ar[2, 5], ar[4, 6]] -
  Diag[ar[1, 3], ar[4, 6], ar[5, 2]] + Diag[ar[1, 4], ar[3, 6], ar[5, 2]] +
  Diag[ar[1, 5], ar[2, 3], ar[4, 6]] - Diag[ar[1, 5], ar[3, 6], ar[4, 2]], 0}
{64, Diag[ar[1, 2], ar[5, 3], ar[6, 4]] - Diag[ar[1, 3], ar[2, 5], ar[6, 4]] -
  Diag[ar[1, 3], ar[5, 2], ar[6, 4]] + Diag[ar[1, 4], ar[5, 2], ar[6, 3]] +
  Diag[ar[1, 5], ar[2, 3], ar[6, 4]] - Diag[ar[1, 5], ar[4, 2], ar[6, 3]], 0}
{65, -Diag[ar[1, 4], ar[2, 5], ar[3, 6]] + Diag[ar[1, 5], ar[2, 4], ar[3, 6]] -
  Diag[ar[1, 5], ar[3, 2], ar[4, 6]] + Diag[ar[2, 1], ar[3, 5], ar[4, 6]], 0}
{15 319, 5003}
{66, -Diag[ar[1, 4], ar[2, 5], ar[6, 3]] + Diag[ar[1, 5], ar[2, 4], ar[6, 3]] -
  Diag[ar[1, 5], ar[3, 2], ar[6, 4]] + Diag[ar[2, 1], ar[3, 5], ar[6, 4]], 0}
{67, -Diag[ar[2, 1], ar[3, 5], ar[4, 6]] + Diag[ar[2, 4], ar[3, 6], ar[5, 1]] +
  Diag[ar[2, 5], ar[3, 1], ar[4, 6]] - Diag[ar[2, 5], ar[3, 6], ar[4, 1]] +
  Diag[ar[3, 1], ar[4, 6], ar[5, 2]] - Diag[ar[3, 2], ar[4, 6], ar[5, 1]], 0}

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{68, -Diag[ar[2, 1], ar[3, 5], ar[6, 4]] + Diag[ar[2, 4], ar[5, 1], ar[6, 3]] +
  Diag[ar[2, 5], ar[3, 1], ar[6, 4]] - Diag[ar[2, 5], ar[4, 1], ar[6, 3]] +
  Diag[ar[3, 1], ar[5, 2], ar[6, 4]] - Diag[ar[3, 2], ar[5, 1], ar[6, 4]], 0}
{69, -Diag[ar[1, 2], ar[4, 6], ar[5, 3]] + Diag[ar[2, 3], ar[4, 6], ar[5, 1]] +
  Diag[ar[3, 6], ar[4, 1], ar[5, 2]] - Diag[ar[3, 6], ar[4, 2], ar[5, 1]], 0}
{70, -Diag[ar[1, 2], ar[5, 3], ar[6, 4]] + Diag[ar[2, 3], ar[5, 1], ar[6, 4]] +
  Diag[ar[4, 1], ar[5, 2], ar[6, 3]] - Diag[ar[4, 2], ar[5, 1], ar[6, 3]], 0}
{15 319, 5003}

{71, -Diag[ar[2, 1], ar[4, 6], ar[5, 3]] + Diag[ar[3, 2], ar[4, 6], ar[5, 1]] -
  Diag[ar[3, 6], ar[4, 1], ar[5, 2]] + Diag[ar[3, 6], ar[4, 2], ar[5, 1]], 0}
{72, -Diag[ar[2, 1], ar[5, 3], ar[6, 4]] + Diag[ar[3, 2], ar[5, 1], ar[6, 4]] -
  Diag[ar[4, 1], ar[5, 2], ar[6, 3]] + Diag[ar[4, 2], ar[5, 1], ar[6, 3]], 0}
{73, Diag[ar[1, 3], ar[2, 6], ar[4, 5]] + Diag[ar[1, 4], ar[2, 5], ar[3, 6]] -
  Diag[ar[1, 5], ar[2, 4], ar[3, 6]] - Diag[ar[1, 5], ar[2, 6], ar[3, 4]], 0}
{74, Diag[ar[1, 3], ar[4, 5], ar[6, 2]] + Diag[ar[1, 4], ar[2, 5], ar[6, 3]] -
  Diag[ar[1, 5], ar[2, 4], ar[6, 3]] - Diag[ar[1, 5], ar[3, 4], ar[6, 2]], 0}
{75, Diag[ar[1, 3], ar[2, 6], ar[5, 4]] - Diag[ar[1, 4], ar[2, 5], ar[3, 6]] +
  Diag[ar[1, 5], ar[2, 4], ar[3, 6]] - Diag[ar[1, 5], ar[2, 6], ar[4, 3]], 0}
{76, Diag[ar[1, 3], ar[5, 4], ar[6, 2]] - Diag[ar[1, 4], ar[2, 5], ar[6, 3]] +
  Diag[ar[1, 5], ar[2, 4], ar[6, 3]] - Diag[ar[1, 5], ar[4, 3], ar[6, 2]], 0}
{77, -Diag[ar[1, 4], ar[2, 6], ar[3, 5]] + Diag[ar[1, 5], ar[2, 6], ar[3, 4]] -
  Diag[ar[1, 5], ar[3, 6], ar[4, 2]] + Diag[ar[2, 5], ar[3, 6], ar[4, 1]] +
  Diag[ar[2, 6], ar[3, 1], ar[4, 5]] - Diag[ar[2, 6], ar[3, 5], ar[4, 1]], 0}
{78, -Diag[ar[1, 4], ar[3, 5], ar[6, 2]] + Diag[ar[1, 5], ar[3, 4], ar[6, 2]] -
  Diag[ar[1, 5], ar[4, 2], ar[6, 3]] + Diag[ar[2, 5], ar[4, 1], ar[6, 3]] +
  Diag[ar[3, 1], ar[4, 5], ar[6, 2]] - Diag[ar[3, 5], ar[4, 1], ar[6, 2]], 0}
{79, -Diag[ar[2, 6], ar[3, 1], ar[4, 5]] + Diag[ar[2, 6], ar[3, 4], ar[5, 1]] +
  Diag[ar[3, 6], ar[4, 1], ar[5, 2]] - Diag[ar[3, 6], ar[4, 2], ar[5, 1]], 0}
{80, -Diag[ar[3, 1], ar[4, 5], ar[6, 2]] + Diag[ar[3, 4], ar[5, 1], ar[6, 2]] +
  Diag[ar[4, 1], ar[5, 2], ar[6, 3]] - Diag[ar[4, 2], ar[5, 1], ar[6, 3]], 0}
{81, -Diag[ar[1, 3], ar[2, 6], ar[5, 4]] + Diag[ar[1, 4], ar[2, 6], ar[5, 3]] -
  Diag[ar[1, 4], ar[3, 6], ar[5, 2]] + Diag[ar[2, 4], ar[3, 6], ar[5, 1]] +
  Diag[ar[2, 6], ar[4, 1], ar[5, 3]] - Diag[ar[2, 6], ar[4, 3], ar[5, 1]], 0}
{82, -Diag[ar[1, 3], ar[5, 4], ar[6, 2]] - Diag[ar[1, 4], ar[5, 2], ar[6, 3]] +
  Diag[ar[1, 4], ar[5, 3], ar[6, 2]] + Diag[ar[2, 4], ar[5, 1], ar[6, 3]] +
  Diag[ar[4, 1], ar[5, 3], ar[6, 2]] - Diag[ar[4, 3], ar[5, 1], ar[6, 2]], 0}
{83, -Diag[ar[2, 6], ar[3, 1], ar[5, 4]] + Diag[ar[2, 6], ar[4, 3], ar[5, 1]] -
  Diag[ar[3, 6], ar[4, 1], ar[5, 2]] + Diag[ar[3, 6], ar[4, 2], ar[5, 1]], 0}
{84, -Diag[ar[3, 1], ar[5, 4], ar[6, 2]] - Diag[ar[4, 1], ar[5, 2], ar[6, 3]] +
  Diag[ar[4, 2], ar[5, 1], ar[6, 3]] + Diag[ar[4, 3], ar[5, 1], ar[6, 2]], 0}
{85, Diag[ar[1, 2], ar[3, 6], ar[4, 5]] + Diag[ar[1, 5], ar[2, 6], ar[3, 4]] -
  Diag[ar[1, 6], ar[2, 3], ar[4, 5]] - Diag[ar[1, 6], ar[2, 5], ar[3, 4]], 0}
{86, Diag[ar[1, 2], ar[3, 6], ar[5, 4]] + Diag[ar[1, 5], ar[2, 6], ar[4, 3]] -
  Diag[ar[1, 6], ar[2, 3], ar[5, 4]] - Diag[ar[1, 6], ar[2, 5], ar[4, 3]], 0}
{87, Diag[ar[1, 2], ar[4, 5], ar[6, 3]] - Diag[ar[1, 3], ar[2, 6], ar[4, 5]] -
  Diag[ar[1, 3], ar[4, 5], ar[6, 2]] + Diag[ar[1, 5], ar[3, 4], ar[6, 2]] +
  Diag[ar[1, 6], ar[2, 3], ar[4, 5]] - Diag[ar[1, 6], ar[3, 4], ar[5, 2]], 0}

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{88, Diag[ar[1, 2], ar[5, 4], ar[6, 3]] - Diag[ar[1, 3], ar[2, 6], ar[5, 4]] -
  Diag[ar[1, 3], ar[5, 4], ar[6, 2]] + Diag[ar[1, 5], ar[4, 3], ar[6, 2]] +
  Diag[ar[1, 6], ar[2, 3], ar[5, 4]] - Diag[ar[1, 6], ar[4, 3], ar[5, 2]], 0}

{89, -Diag[ar[1, 5], ar[2, 6], ar[3, 4]] + Diag[ar[1, 6], ar[2, 5], ar[3, 4]] -
  Diag[ar[1, 6], ar[3, 2], ar[4, 5]] + Diag[ar[2, 1], ar[3, 6], ar[4, 5]], 0}

{90, -Diag[ar[1, 5], ar[2, 6], ar[4, 3]] + Diag[ar[1, 6], ar[2, 5], ar[4, 3]] -
  Diag[ar[1, 6], ar[3, 2], ar[5, 4]] + Diag[ar[2, 1], ar[3, 6], ar[5, 4]], 0}

{91, -Diag[ar[2, 1], ar[3, 6], ar[4, 5]] + Diag[ar[2, 5], ar[3, 4], ar[6, 1]] +
  Diag[ar[2, 6], ar[3, 1], ar[4, 5]] - Diag[ar[2, 6], ar[3, 4], ar[5, 1]] +
  Diag[ar[3, 1], ar[4, 5], ar[6, 2]] - Diag[ar[3, 2], ar[4, 5], ar[6, 1]], 0}

{92, -Diag[ar[2, 1], ar[3, 6], ar[5, 4]] + Diag[ar[2, 5], ar[4, 3], ar[6, 1]] +
  Diag[ar[2, 6], ar[3, 1], ar[5, 4]] - Diag[ar[2, 6], ar[4, 3], ar[5, 1]] +
  Diag[ar[3, 1], ar[5, 4], ar[6, 2]] - Diag[ar[3, 2], ar[5, 4], ar[6, 1]], 0}

{93, -Diag[ar[1, 2], ar[4, 5], ar[6, 3]] + Diag[ar[2, 3], ar[4, 5], ar[6, 1]] +
  Diag[ar[3, 4], ar[5, 1], ar[6, 2]] - Diag[ar[3, 4], ar[5, 2], ar[6, 1]], 0}

{94, -Diag[ar[1, 2], ar[5, 4], ar[6, 3]] + Diag[ar[2, 3], ar[5, 4], ar[6, 1]] +
  Diag[ar[4, 3], ar[5, 1], ar[6, 2]] - Diag[ar[4, 3], ar[5, 2], ar[6, 1]], 0}

{95, -Diag[ar[2, 1], ar[4, 5], ar[6, 3]] + Diag[ar[3, 2], ar[4, 5], ar[6, 1]] -
  Diag[ar[3, 4], ar[5, 1], ar[6, 2]] + Diag[ar[3, 4], ar[5, 2], ar[6, 1]], 0}

{96, -Diag[ar[2, 1], ar[5, 4], ar[6, 3]] + Diag[ar[3, 2], ar[5, 4], ar[6, 1]] -
  Diag[ar[4, 3], ar[5, 1], ar[6, 2]] + Diag[ar[4, 3], ar[5, 2], ar[6, 1]], 0}

{97, Diag[ar[1, 3], ar[2, 5], ar[4, 6]] -
  Diag[ar[1, 4], ar[2, 5], ar[3, 6]] + Diag[ar[1, 4], ar[2, 6], ar[3, 5]] +
  Diag[ar[1, 5], ar[2, 4], ar[3, 6]] - 2 Diag[ar[1, 6], ar[2, 4], ar[3, 5]], 0}

{15319, 4628}

{15319, 4628}

{98, Diag[ar[1, 3], ar[4, 6], ar[5, 2]] + Diag[ar[1, 4], ar[2, 6], ar[5, 3]] -
  Diag[ar[1, 4], ar[3, 6], ar[5, 2]] + Diag[ar[1, 5], ar[3, 6], ar[4, 2]] -
  Diag[ar[1, 6], ar[2, 4], ar[5, 3]] - Diag[ar[1, 6], ar[3, 5], ar[4, 2]], 0}

{99, Diag[ar[1, 3], ar[2, 5], ar[6, 4]] - Diag[ar[1, 4], ar[2, 5], ar[6, 3]] -
  Diag[ar[1, 4], ar[2, 6], ar[3, 5]] + Diag[ar[1, 5], ar[2, 4], ar[6, 3]] +
  Diag[ar[1, 6], ar[2, 4], ar[3, 5]] - Diag[ar[1, 6], ar[2, 4], ar[5, 3]], 0}

{100, Diag[ar[1, 3], ar[5, 2], ar[6, 4]] - Diag[ar[1, 4], ar[2, 6], ar[5, 3]] -
  Diag[ar[1, 4], ar[5, 2], ar[6, 3]] + Diag[ar[1, 5], ar[4, 2], ar[6, 3]] +
  Diag[ar[1, 6], ar[2, 4], ar[5, 3]] - Diag[ar[1, 6], ar[4, 2], ar[5, 3]], 0}

{101, -Diag[ar[1, 5], ar[2, 4], ar[3, 6]] + Diag[ar[1, 6], ar[2, 4], ar[3, 5]] -
  Diag[ar[1, 6], ar[3, 5], ar[4, 2]] + Diag[ar[2, 5], ar[3, 1], ar[4, 6]] -
  Diag[ar[2, 5], ar[3, 6], ar[4, 1]] + Diag[ar[2, 6], ar[3, 5], ar[4, 1]], 0}

{102, -Diag[ar[1, 5], ar[3, 6], ar[4, 2]] + Diag[ar[1, 6], ar[3, 5], ar[4, 2]] -
  Diag[ar[1, 6], ar[4, 2], ar[5, 3]] + Diag[ar[2, 6], ar[4, 1], ar[5, 3]] +
  Diag[ar[3, 1], ar[4, 6], ar[5, 2]] - Diag[ar[3, 6], ar[4, 1], ar[5, 2]], 0}

{15319, 5066}

{103, Diag[ar[2, 4], ar[3, 5], ar[6, 1]] - Diag[ar[2, 4], ar[3, 6], ar[5, 1]] -
  Diag[ar[2, 5], ar[3, 1], ar[4, 6]] + Diag[ar[2, 5], ar[3, 6], ar[4, 1]] +
  Diag[ar[3, 5], ar[4, 1], ar[6, 2]] - Diag[ar[3, 5], ar[4, 2], ar[6, 1]], 0}

```





```

SetDirectory["/scratch/leung"]

/scratch/leung

SaveUSp[diag_Diag] := Module[
  {fname},
  fname = StringJoin[
    "USpFor",
    ToString[FromDigits[Cases[diag, _Integer, Infinity], spbase]],
    ".m"
  ];
  Print["Saving ", fname, " ..."];
  Put[{diag, USp[diag]}, fname];
]

basis = BasisAArrow[4]

{Diag[ar[5, 1], ar[6, 4], ar[7, 3], ar[8, 2]],
Diag[ar[3, 2], ar[6, 1], ar[7, 5], ar[8, 4]], Diag[ar[4, 2], ar[6, 1], ar[7, 5], ar[8, 3]],
Diag[ar[4, 7], ar[5, 2], ar[6, 1], ar[8, 3]], Diag[ar[5, 2], ar[6, 1], ar[7, 4], ar[8, 3]],
Diag[ar[4, 3], ar[6, 1], ar[7, 5], ar[8, 2]], Diag[ar[4, 7], ar[5, 3], ar[6, 1], ar[8, 2]],
Diag[ar[5, 3], ar[6, 1], ar[7, 4], ar[8, 2]], Diag[ar[4, 5], ar[6, 1], ar[7, 3], ar[8, 2]],
Diag[ar[5, 4], ar[6, 1], ar[7, 3], ar[8, 2]], Diag[ar[1, 7], ar[4, 2], ar[6, 3], ar[8, 5]],
Diag[ar[1, 7], ar[3, 6], ar[4, 8], ar[5, 2]], Diag[ar[1, 7], ar[3, 6], ar[5, 2], ar[8, 4]],
Diag[ar[1, 7], ar[5, 2], ar[6, 3], ar[8, 4]], Diag[ar[1, 7], ar[3, 8], ar[5, 2], ar[6, 4]],
Diag[ar[1, 7], ar[5, 2], ar[6, 4], ar[8, 3]], Diag[ar[1, 7], ar[2, 6], ar[5, 3], ar[8, 4]],
Diag[ar[1, 7], ar[4, 3], ar[6, 2], ar[8, 5]], Diag[ar[1, 7], ar[3, 5], ar[4, 8], ar[6, 2]],
Diag[ar[1, 7], ar[3, 5], ar[6, 2], ar[8, 4]], Diag[ar[1, 7], ar[4, 8], ar[5, 3], ar[6, 2]],
Diag[ar[1, 7], ar[5, 3], ar[6, 2], ar[8, 4]], Diag[ar[1, 7], ar[3, 8], ar[4, 5], ar[6, 2]],
Diag[ar[1, 7], ar[3, 8], ar[5, 4], ar[6, 2]], Diag[ar[1, 7], ar[4, 5], ar[6, 2], ar[8, 3]],
Diag[ar[1, 7], ar[5, 4], ar[6, 2], ar[8, 3]], Diag[ar[1, 7], ar[2, 8], ar[5, 3], ar[6, 4]],
Diag[ar[1, 7], ar[2, 8], ar[5, 4], ar[6, 3]], Diag[ar[1, 7], ar[3, 5], ar[6, 4], ar[8, 2]],
Diag[ar[1, 7], ar[4, 6], ar[5, 3], ar[8, 2]], Diag[ar[1, 7], ar[5, 3], ar[6, 4], ar[8, 2]],
Diag[ar[1, 7], ar[5, 4], ar[6, 3], ar[8, 2]], Diag[ar[3, 2], ar[4, 8], ar[6, 5], ar[7, 1]],
Diag[ar[3, 2], ar[6, 5], ar[7, 1], ar[8, 4]], Diag[ar[4, 2], ar[5, 3], ar[6, 8], ar[7, 1]],
Diag[ar[4, 2], ar[5, 3], ar[7, 1], ar[8, 6]], Diag[ar[4, 2], ar[5, 8], ar[6, 3], ar[7, 1]],
Diag[ar[4, 2], ar[6, 3], ar[7, 1], ar[8, 5]], Diag[ar[2, 5], ar[4, 8], ar[6, 3], ar[7, 1]],
Diag[ar[2, 5], ar[6, 3], ar[7, 1], ar[8, 4]], Diag[ar[3, 4], ar[5, 2], ar[6, 8], ar[7, 1]],
Diag[ar[3, 4], ar[5, 2], ar[7, 1], ar[8, 6]], Diag[ar[4, 3], ar[5, 2], ar[6, 8], ar[7, 1]],
Diag[ar[4, 3], ar[5, 2], ar[7, 1], ar[8, 6]], Diag[ar[3, 6], ar[4, 8], ar[5, 2], ar[7, 1]],
Diag[ar[3, 6], ar[5, 2], ar[7, 1], ar[8, 4]], Diag[ar[4, 8], ar[5, 2], ar[6, 3], ar[7, 1]],
Diag[ar[5, 2], ar[6, 3], ar[7, 1], ar[8, 4]], Diag[ar[3, 8], ar[4, 6], ar[5, 2], ar[7, 1]],
Diag[ar[3, 8], ar[5, 2], ar[6, 4], ar[7, 1]], Diag[ar[4, 6], ar[5, 2], ar[7, 1], ar[8, 3]],
Diag[ar[5, 2], ar[6, 4], ar[7, 1], ar[8, 3]], Diag[ar[2, 6], ar[4, 3], ar[5, 8], ar[7, 1]],
Diag[ar[2, 6], ar[4, 3], ar[7, 1], ar[8, 5]], Diag[ar[2, 6], ar[3, 5], ar[4, 8], ar[7, 1]],

```

```

Diag[ar[2, 6], ar[3, 5], ar[7, 1], ar[8, 4]], Diag[ar[2, 6], ar[4, 8], ar[5, 3], ar[7, 1]],
Diag[ar[2, 6], ar[5, 3], ar[7, 1], ar[8, 4]], Diag[ar[2, 6], ar[3, 8], ar[5, 4], ar[7, 1]],
Diag[ar[2, 6], ar[4, 5], ar[7, 1], ar[8, 3]], Diag[ar[2, 6], ar[5, 4], ar[7, 1], ar[8, 3]],
Diag[ar[4, 3], ar[5, 8], ar[6, 2], ar[7, 1]], Diag[ar[4, 3], ar[6, 2], ar[7, 1], ar[8, 5]],
Diag[ar[3, 5], ar[4, 8], ar[6, 2], ar[7, 1]], Diag[ar[3, 5], ar[6, 2], ar[7, 1], ar[8, 4]],
Diag[ar[4, 8], ar[5, 3], ar[6, 2], ar[7, 1]], Diag[ar[5, 3], ar[6, 2], ar[7, 1], ar[8, 4]],
Diag[ar[3, 8], ar[4, 5], ar[6, 2], ar[7, 1]], Diag[ar[3, 8], ar[5, 4], ar[6, 2], ar[7, 1]],
Diag[ar[4, 5], ar[6, 2], ar[7, 1], ar[8, 3]], Diag[ar[5, 4], ar[6, 2], ar[7, 1], ar[8, 3]],
Diag[ar[2, 8], ar[3, 5], ar[6, 4], ar[7, 1]], Diag[ar[2, 8], ar[4, 6], ar[5, 3], ar[7, 1]],
Diag[ar[2, 8], ar[5, 3], ar[6, 4], ar[7, 1]], Diag[ar[2, 8], ar[3, 6], ar[4, 5], ar[7, 1]],
Diag[ar[2, 8], ar[3, 6], ar[5, 4], ar[7, 1]], Diag[ar[2, 8], ar[4, 5], ar[6, 3], ar[7, 1]],
Diag[ar[2, 8], ar[5, 4], ar[6, 3], ar[7, 1]], Diag[ar[3, 5], ar[6, 4], ar[7, 1], ar[8, 2]],
Diag[ar[4, 6], ar[5, 3], ar[7, 1], ar[8, 2]], Diag[ar[5, 3], ar[6, 4], ar[7, 1], ar[8, 2]],
Diag[ar[3, 6], ar[4, 5], ar[7, 1], ar[8, 2]], Diag[ar[3, 6], ar[5, 4], ar[7, 1], ar[8, 2]],
Diag[ar[4, 5], ar[6, 3], ar[7, 1], ar[8, 2]], Diag[ar[5, 4], ar[6, 3], ar[7, 1], ar[8, 2]],
Diag[ar[1, 8], ar[5, 2], ar[6, 4], ar[7, 3]], Diag[ar[1, 8], ar[2, 6], ar[4, 7], ar[5, 3]],
Diag[ar[1, 8], ar[2, 6], ar[5, 3], ar[7, 4]], Diag[ar[1, 8], ar[4, 3], ar[5, 7], ar[6, 2]],
Diag[ar[1, 8], ar[4, 3], ar[6, 2], ar[7, 5]], Diag[ar[1, 8], ar[3, 5], ar[4, 7], ar[6, 2]],
Diag[ar[1, 8], ar[3, 5], ar[6, 2], ar[7, 4]], Diag[ar[1, 8], ar[4, 7], ar[5, 3], ar[6, 2]],
Diag[ar[1, 8], ar[5, 3], ar[6, 2], ar[7, 4]], Diag[ar[1, 8], ar[3, 7], ar[4, 5], ar[6, 2]],
Diag[ar[1, 8], ar[3, 7], ar[5, 4], ar[6, 2]], Diag[ar[1, 8], ar[4, 5], ar[6, 2], ar[7, 3]],
Diag[ar[1, 8], ar[5, 4], ar[6, 2], ar[7, 3]], Diag[ar[1, 8], ar[2, 7], ar[3, 5], ar[6, 4]],
Diag[ar[1, 8], ar[2, 7], ar[4, 6], ar[5, 3]], Diag[ar[1, 8], ar[2, 7], ar[5, 3], ar[6, 4]],
Diag[ar[1, 8], ar[2, 7], ar[3, 6], ar[4, 5]], Diag[ar[1, 8], ar[2, 7], ar[3, 6], ar[5, 4]],
Diag[ar[1, 8], ar[2, 7], ar[4, 5], ar[6, 3]], Diag[ar[1, 8], ar[2, 7], ar[5, 4], ar[6, 3]],
Diag[ar[1, 8], ar[3, 5], ar[6, 4], ar[7, 2]], Diag[ar[1, 8], ar[4, 6], ar[5, 3], ar[7, 2]],
Diag[ar[1, 8], ar[5, 3], ar[6, 4], ar[7, 2]], Diag[ar[1, 8], ar[3, 6], ar[4, 5], ar[7, 2]],
Diag[ar[1, 8], ar[3, 6], ar[5, 4], ar[7, 2]], Diag[ar[1, 8], ar[4, 5], ar[6, 3], ar[7, 2]],
Diag[ar[1, 8], ar[5, 4], ar[6, 3], ar[7, 2]], Diag[ar[5, 2], ar[6, 4], ar[7, 3], ar[8, 1]],
Diag[ar[2, 6], ar[4, 7], ar[5, 3], ar[8, 1]], Diag[ar[2, 6], ar[5, 3], ar[7, 4], ar[8, 1]],
Diag[ar[4, 3], ar[5, 7], ar[6, 2], ar[8, 1]], Diag[ar[4, 3], ar[6, 2], ar[7, 5], ar[8, 1]],
Diag[ar[3, 5], ar[4, 7], ar[6, 2], ar[8, 1]], Diag[ar[3, 5], ar[6, 2], ar[7, 4], ar[8, 1]],
Diag[ar[4, 7], ar[5, 3], ar[6, 2], ar[8, 1]], Diag[ar[5, 3], ar[6, 2], ar[7, 4], ar[8, 1]],
Diag[ar[3, 7], ar[4, 5], ar[6, 2], ar[8, 1]], Diag[ar[3, 7], ar[5, 4], ar[6, 2], ar[8, 1]],
Diag[ar[4, 5], ar[6, 2], ar[7, 3], ar[8, 1]], Diag[ar[5, 4], ar[6, 2], ar[7, 3], ar[8, 1]],
Diag[ar[2, 7], ar[3, 5], ar[6, 4], ar[8, 1]], Diag[ar[2, 7], ar[4, 6], ar[5, 3], ar[8, 1]],
Diag[ar[2, 7], ar[5, 3], ar[6, 4], ar[8, 1]], Diag[ar[2, 7], ar[3, 6], ar[4, 5], ar[8, 1]],
Diag[ar[2, 7], ar[3, 6], ar[5, 4], ar[8, 1]], Diag[ar[2, 7], ar[4, 5], ar[6, 3], ar[8, 1]],
Diag[ar[2, 7], ar[5, 4], ar[6, 3], ar[8, 1]], Diag[ar[3, 5], ar[6, 4], ar[7, 2], ar[8, 1]],
Diag[ar[4, 6], ar[5, 3], ar[7, 2], ar[8, 1]], Diag[ar[5, 3], ar[6, 4], ar[7, 2], ar[8, 1]],
Diag[ar[3, 6], ar[4, 5], ar[7, 2], ar[8, 1]], Diag[ar[3, 6], ar[5, 4], ar[7, 2], ar[8, 1]],
Diag[ar[4, 5], ar[6, 3], ar[7, 2], ar[8, 1]], Diag[ar[5, 4], ar[6, 3], ar[7, 2], ar[8, 1]]]

```

**Timing[USO[Diag[ar[2, 5], ar[6, 3], ar[4, 1]]]]**

**Timing[USp[Diag[ar[2, 5], ar[6, 3], ar[4, 1]]]]**

{11 670, 3665}

A very large output was generated. Here is a sample of it:

$$\left\{ 14.5288, -\frac{1}{8} n h[1]^2 \text{RSW}[] + 4 n^2 \text{RSW}[111] + \ll 5445 \gg + 6 n^5 \text{RSW}[215, 225, 234, 315, 325, 334] + \right.$$

$$6 n^6 \text{RSW}[215, 226, 234, 315, 326, 334] + 6 n^6 \text{RSW}[216, 223, 245, 316, 323, 345] +$$

$$\left. 6 n^6 \text{RSW}[216, 224, 235, 316, 324, 335] + 6 n^6 \text{RSW}[216, 225, 234, 316, 325, 334] \right\}$$

Show Less

Show More

Show Full Output

Set Size Limit..

{15 319, 4971}

A very large output was generated. Here is a sample of it:

$$\left\{ 22.8565, -\frac{1}{8} n h[1]^2 \text{RSpW}[] + 16 n \text{RSpW}[111] + \right.$$

$$20 n^2 \text{RSpW}[111] + \ll 7436 \gg + 6 n^5 \text{RSpW}[215, 225, 234, 315, 325, 334] +$$

$$6 n^6 \text{RSpW}[215, 226, 234, 315, 326, 334] + 6 n^6 \text{RSpW}[216, 223, 245, 316, 323, 345] +$$

$$\left. 6 n^6 \text{RSpW}[216, 224, 235, 316, 324, 335] + 6 n^6 \text{RSpW}[216, 225, 234, 316, 325, 334] \right\}$$

Show Less

Show More

Show Full Output

Set Size Limit..

**diag = Diag[ar[2, 5], ar[6, 3], ar[7, 1], ar[8, 4]]**

Diag[ar[2, 5], ar[6, 3], ar[7, 1], ar[8, 4]]

**Timing[USO[diag]]**

**MaxMemoryUsed []**

**Timing[USp[diag]]**

**MaxMemoryUsed []**

```
Computing OrderTypes [8, {{1, 2}, {3, 4}, {5, 6}, {7, 8}}]
Computing OrderTypes [8, {{3, 4}, {5, 6}, {7, 8}}]
Computing OrderTypes [8, {{5, 6}, {7, 8}}]
Computing OrderTypes [8, {{7, 8}}]
Computing OrderTypes [7, {{1, 2}, {3, 4}, {5, 6}}]
Computing OrderTypes [7, {{3, 4}, {5, 6}}]
Computing OrderTypes [7, {{5, 6}}]
Computing OrderTypes [5, {{1, 2}, {3, 4}}]
Computing OrderTypes [5, {{3, 4}}]
Computing OrderTypes [3, {{1, 2}}]
Computing OrderTypes [6, {{1, 2}, {3, 4}}]
Computing OrderTypes [6, {{3, 4}}]
Computing OrderTypes [4, {{1, 2}}]
Computing OrderTypes [5, {{1, 2}}]
Computing OrderTypes [7, {{1, 2}, {3, 4}, {6, 7}}]
Computing OrderTypes [7, {{3, 4}, {6, 7}}]
Computing OrderTypes [7, {{6, 7}}]
Computing OrderTypes [5, {{1, 2}, {4, 5}}]
Computing OrderTypes [5, {{4, 5}}]
Computing OrderTypes [3, {{2, 3}}]
Computing OrderTypes [6, {{1, 2}, {5, 6}}]
Computing OrderTypes [6, {{5, 6}}]
Computing OrderTypes [4, {{3, 4}}]
Computing OrderTypes [7, {{1, 2}, {4, 5}, {6, 7}}]
Computing OrderTypes [7, {{4, 5}, {6, 7}}]
Computing OrderTypes [5, {{2, 3}, {4, 5}}]
Computing OrderTypes [6, {{3, 4}, {5, 6}}]
Computing OrderTypes [7, {{2, 3}, {4, 5}, {6, 7}}]
{1 390 450, 169 360}
```

A very large output was generated. Here is a sample of it:

```
{9640.45, <<253 907>> + 24 n8 RSW[218, 226, <<4>>, 335, 347] +
  24 n8 RSW[218, 226, 237, 245, 318, 326, 337, 345] +
  24 n8 RSW[218, 227, 234, 256, 318, 327, 334, 356] +
  24 n8 RSW[218, 227, 235, 246, 318, 327, 335, 346] +
  24 n8 RSW[218, 227, 236, 245, 318, 327, 336, 345]}
```

Show Less

Show More

Show Full Output

Set Size Limit...

1 554 381 184

{1 861 761, 229 061}

A very large output was generated. Here is a sample of it:

```
{16 236.9,
  <<344 507>> + 24 <<1>> RSpW[218, <<7>>] + 24 n8 RSpW[218, 226, 237, 245, 318, 326, 337, 345] +
  24 n8 RSpW[218, 227, 234, 256, 318, 327, 334, 356] +
  24 n8 RSpW[218, 227, 235, 246, 318, 327, 335, 346] +
  24 n8 RSpW[218, 227, 236, 245, 318, 327, 336, 345]}
```

Show Less

Show More

Show Full Output

Set Size Limit...

2 538 741 824

16 236 / 60.

270.6

**SetDirectory["/scratch/leung"]**

/scratch/leung

**Directory[]**

/scratch/leung

```
For[index = 2, index ≤ Length[basis], index++,
  Print[index, " ", basis[[index]]];
  Timing[SaveUSp[basis[[index]]]]
];
```

```

1 Diag[ar[5, 1], ar[6, 4], ar[7, 3], ar[8, 2]]
Saving USpFor51647382.m ...
Computing OrderTypes[8, {{1, 2}, {3, 4}, {5, 6}, {7, 8}}]
Computing OrderTypes[8, {{3, 4}, {5, 6}, {7, 8}}]
Computing OrderTypes[8, {{5, 6}, {7, 8}}]
Computing OrderTypes[8, {{7, 8}}]
Computing OrderTypes[7, {{1, 2}, {3, 4}, {5, 6}}]
Computing OrderTypes[7, {{3, 4}, {5, 6}}]
Computing OrderTypes[7, {{5, 6}}]
Computing OrderTypes[6, {{1, 2}, {3, 4}}]
Computing OrderTypes[6, {{3, 4}}]
Computing OrderTypes[5, {{1, 2}}]
Computing OrderTypes[7, {{1, 2}, {3, 4}, {6, 7}}]
Computing OrderTypes[7, {{3, 4}, {6, 7}}]
Computing OrderTypes[7, {{6, 7}}]
Computing OrderTypes[6, {{1, 2}, {5, 6}}]
Computing OrderTypes[7, {{1, 2}, {4, 5}, {6, 7}}]
Computing OrderTypes[7, {{4, 5}, {6, 7}}]
Computing OrderTypes[7, {{2, 3}, {4, 5}, {6, 7}}]
{1861761, 225791}
2 Diag[ar[3, 2], ar[6, 1], ar[7, 5], ar[8, 4]]
Saving USpFor32617584.m ...
      $Aborted

      Table[
        Print[{{ind, rels[[ind]], usp = USp[rels[[ind]]]}}];
        usp,
        {ind, 1}
      ]
Computing OrderTypes[6, {{1, 2}, {3, 4}, {5, 6}}]
Computing OrderTypes[6, {{3, 4}, {5, 6}}]
Computing OrderTypes[6, {{5, 6}}]
Computing OrderTypes[5, {{1, 2}, {3, 4}}]
Computing OrderTypes[5, {{3, 4}}]
Computing OrderTypes[4, {{1, 2}}]
Computing OrderTypes[3, {{1, 2}}]
Computing OrderTypes[5, {{1, 2}, {4, 5}}]

```

```

Computing OrderTypes [5, {{4, 5}}]
Computing OrderTypes [4, {{3, 4}}]
Computing OrderTypes [3, {{2, 3}}]
Computing OrderTypes [5, {{2, 3}, {4, 5}}]
{15 319, 2875}
{15 319, 2851}
{15 319, 2872}
{1, Diag[ar[1, 2], ar[3, 4], ar[5, 6]] +
  Diag[ar[1, 2], ar[3, 5], ar[4, 6]] - 2 Diag[ar[1, 2], ar[3, 6], ar[4, 5]], 0}
{15 319, 4509}
{15 319, 4512}
{2, Diag[ar[1, 2], ar[3, 4], ar[6, 5]] - Diag[ar[1, 2], ar[3, 5], ar[4, 6]] +
  Diag[ar[1, 2], ar[3, 6], ar[4, 5]] - Diag[ar[1, 2], ar[3, 6], ar[5, 4]], 0}
{15 319, 4509}
{3, -Diag[ar[1, 2], ar[3, 5], ar[4, 6]] + Diag[ar[1, 2], ar[3, 6], ar[4, 5]] -
  Diag[ar[1, 2], ar[3, 6], ar[5, 4]] + Diag[ar[1, 2], ar[4, 3], ar[5, 6]], 0}
{15 319, 4570}
{15 319, 4864}
{15 319, 4873}
{4, -Diag[ar[1, 2], ar[4, 3], ar[5, 6]] + Diag[ar[1, 2], ar[4, 5], ar[6, 3]] +
  Diag[ar[1, 2], ar[5, 3], ar[6, 4]] - Diag[ar[1, 2], ar[5, 4], ar[6, 3]], 0}
{5, -Diag[ar[1, 2], ar[3, 4], ar[6, 5]] + Diag[ar[1, 2], ar[4, 5], ar[6, 3]] +
  Diag[ar[1, 2], ar[5, 3], ar[6, 4]] - Diag[ar[1, 2], ar[5, 4], ar[6, 3]], 0}
{15 319, 4818}
{6, -Diag[ar[1, 2], ar[4, 3], ar[6, 5]] -
  Diag[ar[1, 2], ar[5, 3], ar[6, 4]] + 2 Diag[ar[1, 2], ar[5, 4], ar[6, 3]], 0}
{15 319, 4509}
{15 319, 4484}
{15 319, 4479}
{7, Diag[ar[2, 1], ar[3, 4], ar[5, 6]] +
  Diag[ar[2, 1], ar[3, 5], ar[4, 6]] - 2 Diag[ar[2, 1], ar[3, 6], ar[4, 5]], 0}
{15 319, 4818}
{15 319, 4824}
{8, Diag[ar[2, 1], ar[3, 4], ar[6, 5]] - Diag[ar[2, 1], ar[3, 5], ar[4, 6]] +
  Diag[ar[2, 1], ar[3, 6], ar[4, 5]] - Diag[ar[2, 1], ar[3, 6], ar[5, 4]], 0}
{15 319, 4818}
{9, -Diag[ar[2, 1], ar[3, 5], ar[4, 6]] + Diag[ar[2, 1], ar[3, 6], ar[4, 5]] -
  Diag[ar[2, 1], ar[3, 6], ar[5, 4]] + Diag[ar[2, 1], ar[4, 3], ar[5, 6]], 0}
{15 319, 4903}

```

```

{15 319, 4904}

{15 319, 4915}

{10, -Diag[ar[2, 1], ar[4, 3], ar[5, 6]] + Diag[ar[2, 1], ar[4, 5], ar[6, 3]] +
  Diag[ar[2, 1], ar[5, 3], ar[6, 4]] - Diag[ar[2, 1], ar[5, 4], ar[6, 3]], 0}

{11, -Diag[ar[2, 1], ar[3, 4], ar[6, 5]] + Diag[ar[2, 1], ar[4, 5], ar[6, 3]] +
  Diag[ar[2, 1], ar[5, 3], ar[6, 4]] - Diag[ar[2, 1], ar[5, 4], ar[6, 3]], 0}

{15 319, 4858}

{12, -Diag[ar[2, 1], ar[4, 3], ar[6, 5]] -
  Diag[ar[2, 1], ar[5, 3], ar[6, 4]] + 2 Diag[ar[2, 1], ar[5, 4], ar[6, 3]], 0}

{15 319, 2851}

{15 319, 2780}

{15 319, 2866}

{15 319, 2909}

{13, Diag[ar[1, 3], ar[2, 4], ar[5, 6]] - Diag[ar[1, 3], ar[2, 6], ar[4, 5]] +
  Diag[ar[1, 4], ar[2, 5], ar[3, 6]] - Diag[ar[1, 4], ar[2, 6], ar[3, 5]], 0}

{15 319, 4484}

{15 319, 4497}

{14, Diag[ar[1, 3], ar[2, 4], ar[6, 5]] - Diag[ar[1, 3], ar[2, 6], ar[5, 4]] -
  Diag[ar[1, 4], ar[2, 5], ar[3, 6]] + Diag[ar[1, 4], ar[2, 6], ar[3, 5]], 0}

{15 319, 2895}

{15 319, 4645}

{15 319, 4608}

{15 319, 4651}

{15 319, 4593}

{15, -Diag[ar[1, 3], ar[2, 5], ar[4, 6]] + Diag[ar[1, 3], ar[2, 6], ar[4, 5]] +
  Diag[ar[1, 3], ar[4, 2], ar[5, 6]] - Diag[ar[1, 3], ar[4, 6], ar[5, 2]] -
  Diag[ar[1, 4], ar[2, 6], ar[5, 3]] + Diag[ar[1, 4], ar[3, 6], ar[5, 2]], 0}

{15 319, 4737}

{15 319, 5071}

{15 319, 5098}

{16, -Diag[ar[1, 3], ar[4, 2], ar[5, 6]] + Diag[ar[1, 3], ar[4, 5], ar[6, 2]] +
  Diag[ar[1, 4], ar[5, 2], ar[6, 3]] - Diag[ar[1, 4], ar[5, 3], ar[6, 2]], 0}

{15 319, 4688}

{15 319, 5061}

{15 319, 5040}

{15 319, 4683}

{15 319, 4745}

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{17, -Diag[ar[1, 3], ar[2, 4], ar[6, 5]] + Diag[ar[1, 3], ar[2, 5], ar[6, 4]] +
  Diag[ar[1, 3], ar[5, 2], ar[6, 4]] - Diag[ar[1, 3], ar[5, 4], ar[6, 2]] -
  Diag[ar[1, 4], ar[2, 5], ar[6, 3]] + Diag[ar[1, 4], ar[3, 5], ar[6, 2]], 0}
{15 319, 5003}

{18, -Diag[ar[1, 3], ar[4, 2], ar[6, 5]] + Diag[ar[1, 3], ar[5, 4], ar[6, 2]] -
  Diag[ar[1, 4], ar[5, 2], ar[6, 3]] + Diag[ar[1, 4], ar[5, 3], ar[6, 2]], 0}
{15 319, 4645}
{15 319, 4681}
{15 319, 4611}
{15 319, 4687}

{19, Diag[ar[2, 4], ar[3, 1], ar[5, 6]] + Diag[ar[2, 5], ar[3, 6], ar[4, 1]] -
  Diag[ar[2, 6], ar[3, 1], ar[4, 5]] - Diag[ar[2, 6], ar[3, 5], ar[4, 1]], 0}
{15 319, 5003}
{15 319, 5019}

{20, Diag[ar[2, 4], ar[3, 1], ar[6, 5]] - Diag[ar[2, 5], ar[3, 6], ar[4, 1]] -
  Diag[ar[2, 6], ar[3, 1], ar[5, 4]] + Diag[ar[2, 6], ar[3, 5], ar[4, 1]], 0}
{15 319, 4687}
{15 319, 5049}
{15 319, 4864}
{15 319, 5062}
{15 319, 5069}

{21, -Diag[ar[2, 5], ar[3, 1], ar[4, 6]] + Diag[ar[2, 6], ar[3, 1], ar[4, 5]] -
  Diag[ar[2, 6], ar[4, 1], ar[5, 3]] + Diag[ar[3, 1], ar[4, 2], ar[5, 6]] -
  Diag[ar[3, 1], ar[4, 6], ar[5, 2]] + Diag[ar[3, 6], ar[4, 1], ar[5, 2]], 0}
{15 319, 4934}
{15 319, 4927}
{15 319, 4996}

{22, -Diag[ar[3, 1], ar[4, 2], ar[5, 6]] + Diag[ar[3, 1], ar[4, 5], ar[6, 2]] +
  Diag[ar[4, 1], ar[5, 2], ar[6, 3]] - Diag[ar[4, 1], ar[5, 3], ar[6, 2]], 0}
{15 319, 4931}
{15 319, 4971}
{15 319, 4966}
{15 319, 4861}
{15 319, 5092}

{23, -Diag[ar[2, 4], ar[3, 1], ar[6, 5]] + Diag[ar[2, 5], ar[3, 1], ar[6, 4]] -
  Diag[ar[2, 5], ar[4, 1], ar[6, 3]] + Diag[ar[3, 1], ar[5, 2], ar[6, 4]] -
  Diag[ar[3, 1], ar[5, 4], ar[6, 2]] + Diag[ar[3, 5], ar[4, 1], ar[6, 2]], 0}
{15 319, 4904}

{24, -Diag[ar[3, 1], ar[4, 2], ar[6, 5]] + Diag[ar[3, 1], ar[5, 4], ar[6, 2]] -
  Diag[ar[4, 1], ar[5, 2], ar[6, 3]] + Diag[ar[4, 1], ar[5, 3], ar[6, 2]], 0}

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{15 319, 2785}

{15 319, 2857}

{25, Diag[ar[1, 4], ar[2, 5], ar[3, 6]] - Diag[ar[1, 4], ar[2, 6], ar[3, 5]] +
  Diag[ar[1, 5], ar[2, 3], ar[4, 6]] - Diag[ar[1, 5], ar[2, 6], ar[3, 4]], 0}

{15 319, 4615}

{15 319, 2910}

{15 319, 4690}

{26, Diag[ar[1, 4], ar[2, 5], ar[6, 3]] - Diag[ar[1, 4], ar[2, 6], ar[5, 3]] +
  Diag[ar[1, 5], ar[2, 3], ar[6, 4]] - Diag[ar[1, 5], ar[2, 4], ar[3, 6]] -
  Diag[ar[1, 5], ar[2, 4], ar[6, 3]] + Diag[ar[1, 5], ar[2, 6], ar[3, 4]], 0}

{15 319, 4486}

{15 319, 4497}

{27, -Diag[ar[1, 4], ar[2, 5], ar[3, 6]] + Diag[ar[1, 4], ar[2, 6], ar[3, 5]] -
  Diag[ar[1, 5], ar[2, 6], ar[4, 3]] + Diag[ar[1, 5], ar[3, 2], ar[4, 6]], 0}

{15 319, 4650}

{15 319, 5052}

{15 319, 5056}

{28, Diag[ar[1, 4], ar[3, 5], ar[6, 2]] - Diag[ar[1, 4], ar[3, 6], ar[5, 2]] -
  Diag[ar[1, 5], ar[3, 2], ar[4, 6]] + Diag[ar[1, 5], ar[3, 6], ar[4, 2]] +
  Diag[ar[1, 5], ar[4, 2], ar[6, 3]] - Diag[ar[1, 5], ar[4, 3], ar[6, 2]], 0}

{15 319, 4736}

{29, Diag[ar[1, 4], ar[5, 2], ar[6, 3]] - Diag[ar[1, 4], ar[5, 3], ar[6, 2]] -
  Diag[ar[1, 5], ar[2, 3], ar[6, 4]] + Diag[ar[1, 5], ar[3, 4], ar[6, 2]], 0}

{15 319, 5021}

{30, -Diag[ar[1, 4], ar[5, 2], ar[6, 3]] + Diag[ar[1, 4], ar[5, 3], ar[6, 2]] -
  Diag[ar[1, 5], ar[3, 2], ar[6, 4]] + Diag[ar[1, 5], ar[4, 3], ar[6, 2]], 0}

{15 319, 4733}

{15 319, 4732}

{31, Diag[ar[2, 3], ar[4, 6], ar[5, 1]] + Diag[ar[2, 5], ar[3, 6], ar[4, 1]] -
  Diag[ar[2, 6], ar[3, 4], ar[5, 1]] - Diag[ar[2, 6], ar[3, 5], ar[4, 1]], 0}

{15 319, 4932}

{15 319, 4744}

{15 319, 5093}

{32, Diag[ar[2, 3], ar[5, 1], ar[6, 4]] - Diag[ar[2, 4], ar[3, 6], ar[5, 1]] -
  Diag[ar[2, 4], ar[5, 1], ar[6, 3]] + Diag[ar[2, 5], ar[4, 1], ar[6, 3]] +
  Diag[ar[2, 6], ar[3, 4], ar[5, 1]] - Diag[ar[2, 6], ar[4, 1], ar[5, 3]], 0}

{15 319, 5056}

{15 319, 5039}

{33, -Diag[ar[2, 5], ar[3, 6], ar[4, 1]] + Diag[ar[2, 6], ar[3, 5], ar[4, 1]] -
  Diag[ar[2, 6], ar[4, 3], ar[5, 1]] + Diag[ar[3, 2], ar[4, 6], ar[5, 1]], 0}

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{15 319, 5103}

{15 319, 4996}

{15 319, 4921}

{34, -Diag[ar[3, 2], ar[4, 6], ar[5, 1]] + Diag[ar[3, 5], ar[4, 1], ar[6, 2]] -
  Diag[ar[3, 6], ar[4, 1], ar[5, 2]] + Diag[ar[3, 6], ar[4, 2], ar[5, 1]] +
  Diag[ar[4, 2], ar[5, 1], ar[6, 3]] - Diag[ar[4, 3], ar[5, 1], ar[6, 2]], 0}

{15 319, 4859}

{35, -Diag[ar[2, 3], ar[5, 1], ar[6, 4]] + Diag[ar[3, 4], ar[5, 1], ar[6, 2]] +
  Diag[ar[4, 1], ar[5, 2], ar[6, 3]] - Diag[ar[4, 1], ar[5, 3], ar[6, 2]], 0}

{15 319, 4866}

{36, -Diag[ar[3, 2], ar[5, 1], ar[6, 4]] - Diag[ar[4, 1], ar[5, 2], ar[6, 3]] +
  Diag[ar[4, 1], ar[5, 3], ar[6, 2]] + Diag[ar[4, 3], ar[5, 1], ar[6, 2]], 0}

{15 319, 2849}

{15 319, 2840}

{15 319, 2755}

{37, Diag[ar[1, 6], ar[2, 3], ar[4, 5]] +
  Diag[ar[1, 6], ar[2, 4], ar[3, 5]] - 2 Diag[ar[1, 6], ar[2, 5], ar[3, 4]], 0}

{15 319, 4483}

{15 319, 4483}

{38, Diag[ar[1, 6], ar[2, 3], ar[5, 4]] - Diag[ar[1, 6], ar[2, 4], ar[3, 5]] +
  Diag[ar[1, 6], ar[2, 5], ar[3, 4]] - Diag[ar[1, 6], ar[2, 5], ar[4, 3]], 0}

{15 319, 4483}

{39, -Diag[ar[1, 6], ar[2, 4], ar[3, 5]] + Diag[ar[1, 6], ar[2, 5], ar[3, 4]] -
  Diag[ar[1, 6], ar[2, 5], ar[4, 3]] + Diag[ar[1, 6], ar[3, 2], ar[4, 5]], 0}

{15 319, 4572}

{15 319, 4879}

{15 319, 4881}

{40, -Diag[ar[1, 6], ar[3, 2], ar[4, 5]] + Diag[ar[1, 6], ar[3, 4], ar[5, 2]] +
  Diag[ar[1, 6], ar[4, 2], ar[5, 3]] - Diag[ar[1, 6], ar[4, 3], ar[5, 2]], 0}

{41, -Diag[ar[1, 6], ar[2, 3], ar[5, 4]] + Diag[ar[1, 6], ar[3, 4], ar[5, 2]] +
  Diag[ar[1, 6], ar[4, 2], ar[5, 3]] - Diag[ar[1, 6], ar[4, 3], ar[5, 2]], 0}

{15 319, 4823}

{42, -Diag[ar[1, 6], ar[3, 2], ar[5, 4]] -
  Diag[ar[1, 6], ar[4, 2], ar[5, 3]] + 2 Diag[ar[1, 6], ar[4, 3], ar[5, 2]], 0}

{15 319, 4579}

{15 319, 4577}

{15 319, 4592}

{43, Diag[ar[2, 3], ar[4, 5], ar[6, 1]] +
  Diag[ar[2, 4], ar[3, 5], ar[6, 1]] - 2 Diag[ar[2, 5], ar[3, 4], ar[6, 1]], 0}

{15 319, 4845}

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{15 319, 4859}

{44, Diag[ar[2, 3], ar[5, 4], ar[6, 1]] - Diag[ar[2, 4], ar[3, 5], ar[6, 1]] +
  Diag[ar[2, 5], ar[3, 4], ar[6, 1]] - Diag[ar[2, 5], ar[4, 3], ar[6, 1]], 0}

{15 319, 4845}

{45, -Diag[ar[2, 4], ar[3, 5], ar[6, 1]] + Diag[ar[2, 5], ar[3, 4], ar[6, 1]] -
  Diag[ar[2, 5], ar[4, 3], ar[6, 1]] + Diag[ar[3, 2], ar[4, 5], ar[6, 1]], 0}

{15 319, 4914}

{15 319, 4921}

{15 319, 4838}

{46, -Diag[ar[3, 2], ar[4, 5], ar[6, 1]] + Diag[ar[3, 4], ar[5, 2], ar[6, 1]] +
  Diag[ar[4, 2], ar[5, 3], ar[6, 1]] - Diag[ar[4, 3], ar[5, 2], ar[6, 1]], 0}

{47, -Diag[ar[2, 3], ar[5, 4], ar[6, 1]] + Diag[ar[3, 4], ar[5, 2], ar[6, 1]] +
  Diag[ar[4, 2], ar[5, 3], ar[6, 1]] - Diag[ar[4, 3], ar[5, 2], ar[6, 1]], 0}

{15 319, 4911}

{48, -Diag[ar[3, 2], ar[5, 4], ar[6, 1]] -
  Diag[ar[4, 2], ar[5, 3], ar[6, 1]] + 2 Diag[ar[4, 3], ar[5, 2], ar[6, 1]], 0}

{15 319, 2872}

{49, Diag[ar[1, 2], ar[3, 4], ar[5, 6]] +
  Diag[ar[1, 3], ar[2, 4], ar[5, 6]] - 2 Diag[ar[1, 4], ar[2, 3], ar[5, 6]], 0}

{15 319, 4479}

{50, Diag[ar[1, 2], ar[3, 4], ar[6, 5]] +
  Diag[ar[1, 3], ar[2, 4], ar[6, 5]] - 2 Diag[ar[1, 4], ar[2, 3], ar[6, 5]], 0}

{15 319, 4512}

{51, Diag[ar[1, 2], ar[4, 3], ar[5, 6]] - Diag[ar[1, 3], ar[2, 4], ar[5, 6]] +
  Diag[ar[1, 4], ar[2, 3], ar[5, 6]] - Diag[ar[1, 4], ar[3, 2], ar[5, 6]], 0}

{15 319, 4824}

{52, Diag[ar[1, 2], ar[4, 3], ar[6, 5]] - Diag[ar[1, 3], ar[2, 4], ar[6, 5]] +
  Diag[ar[1, 4], ar[2, 3], ar[6, 5]] - Diag[ar[1, 4], ar[3, 2], ar[6, 5]], 0}

{53, -Diag[ar[1, 3], ar[2, 4], ar[5, 6]] + Diag[ar[1, 4], ar[2, 3], ar[5, 6]] -
  Diag[ar[1, 4], ar[3, 2], ar[5, 6]] + Diag[ar[2, 1], ar[3, 4], ar[5, 6]], 0}

{54, -Diag[ar[1, 3], ar[2, 4], ar[6, 5]] + Diag[ar[1, 4], ar[2, 3], ar[6, 5]] -
  Diag[ar[1, 4], ar[3, 2], ar[6, 5]] + Diag[ar[2, 1], ar[3, 4], ar[6, 5]], 0}

{15 319, 4570}

{15 319, 4873}

{55, -Diag[ar[2, 1], ar[3, 4], ar[5, 6]] + Diag[ar[2, 3], ar[4, 1], ar[5, 6]] +
  Diag[ar[3, 1], ar[4, 2], ar[5, 6]] - Diag[ar[3, 2], ar[4, 1], ar[5, 6]], 0}

{15 319, 4903}

{15 319, 4915}

{56, -Diag[ar[2, 1], ar[3, 4], ar[6, 5]] + Diag[ar[2, 3], ar[4, 1], ar[6, 5]] +
  Diag[ar[3, 1], ar[4, 2], ar[6, 5]] - Diag[ar[3, 2], ar[4, 1], ar[6, 5]], 0}

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{57, -Diag[ar[1, 2], ar[4, 3], ar[5, 6]] + Diag[ar[2, 3], ar[4, 1], ar[5, 6]] +
  Diag[ar[3, 1], ar[4, 2], ar[5, 6]] - Diag[ar[3, 2], ar[4, 1], ar[5, 6]], 0}
{58, -Diag[ar[1, 2], ar[4, 3], ar[6, 5]] + Diag[ar[2, 3], ar[4, 1], ar[6, 5]] +
  Diag[ar[3, 1], ar[4, 2], ar[6, 5]] - Diag[ar[3, 2], ar[4, 1], ar[6, 5]], 0}
{59, -Diag[ar[2, 1], ar[4, 3], ar[5, 6]] -
  Diag[ar[3, 1], ar[4, 2], ar[5, 6]] + 2Diag[ar[3, 2], ar[4, 1], ar[5, 6]], 0}
{60, -Diag[ar[2, 1], ar[4, 3], ar[6, 5]] -
  Diag[ar[3, 1], ar[4, 2], ar[6, 5]] + 2Diag[ar[3, 2], ar[4, 1], ar[6, 5]], 0}
{61, Diag[ar[1, 2], ar[3, 5], ar[4, 6]] + Diag[ar[1, 4], ar[2, 5], ar[3, 6]] -
  Diag[ar[1, 5], ar[2, 3], ar[4, 6]] - Diag[ar[1, 5], ar[2, 4], ar[3, 6]], 0}
{15319, 4645}
{62, Diag[ar[1, 2], ar[3, 5], ar[6, 4]] + Diag[ar[1, 4], ar[2, 5], ar[6, 3]] -
  Diag[ar[1, 5], ar[2, 3], ar[6, 4]] - Diag[ar[1, 5], ar[2, 4], ar[6, 3]], 0}
{15319, 4645}
{63, Diag[ar[1, 2], ar[4, 6], ar[5, 3]] - Diag[ar[1, 3], ar[2, 5], ar[4, 6]] -
  Diag[ar[1, 3], ar[4, 6], ar[5, 2]] + Diag[ar[1, 4], ar[3, 6], ar[5, 2]] +
  Diag[ar[1, 5], ar[2, 3], ar[4, 6]] - Diag[ar[1, 5], ar[3, 6], ar[4, 2]], 0}
{64, Diag[ar[1, 2], ar[5, 3], ar[6, 4]] - Diag[ar[1, 3], ar[2, 5], ar[6, 4]] -
  Diag[ar[1, 3], ar[5, 2], ar[6, 4]] + Diag[ar[1, 4], ar[5, 2], ar[6, 3]] +
  Diag[ar[1, 5], ar[2, 3], ar[6, 4]] - Diag[ar[1, 5], ar[4, 2], ar[6, 3]], 0}
{65, -Diag[ar[1, 4], ar[2, 5], ar[3, 6]] + Diag[ar[1, 5], ar[2, 4], ar[3, 6]] -
  Diag[ar[1, 5], ar[3, 2], ar[4, 6]] + Diag[ar[2, 1], ar[3, 5], ar[4, 6]], 0}
{15319, 5003}
{66, -Diag[ar[1, 4], ar[2, 5], ar[6, 3]] + Diag[ar[1, 5], ar[2, 4], ar[6, 3]] -
  Diag[ar[1, 5], ar[3, 2], ar[6, 4]] + Diag[ar[2, 1], ar[3, 5], ar[6, 4]], 0}
{67, -Diag[ar[2, 1], ar[3, 5], ar[4, 6]] + Diag[ar[2, 4], ar[3, 6], ar[5, 1]] +
  Diag[ar[2, 5], ar[3, 1], ar[4, 6]] - Diag[ar[2, 5], ar[3, 6], ar[4, 1]] +
  Diag[ar[3, 1], ar[4, 6], ar[5, 2]] - Diag[ar[3, 2], ar[4, 6], ar[5, 1]], 0}
{68, -Diag[ar[2, 1], ar[3, 5], ar[6, 4]] + Diag[ar[2, 4], ar[5, 1], ar[6, 3]] +
  Diag[ar[2, 5], ar[3, 1], ar[6, 4]] - Diag[ar[2, 5], ar[4, 1], ar[6, 3]] +
  Diag[ar[3, 1], ar[5, 2], ar[6, 4]] - Diag[ar[3, 2], ar[5, 1], ar[6, 4]], 0}
{69, -Diag[ar[1, 2], ar[4, 6], ar[5, 3]] + Diag[ar[2, 3], ar[4, 6], ar[5, 1]] +
  Diag[ar[3, 6], ar[4, 1], ar[5, 2]] - Diag[ar[3, 6], ar[4, 2], ar[5, 1]], 0}
{70, -Diag[ar[1, 2], ar[5, 3], ar[6, 4]] + Diag[ar[2, 3], ar[5, 1], ar[6, 4]] +
  Diag[ar[4, 1], ar[5, 2], ar[6, 3]] - Diag[ar[4, 2], ar[5, 1], ar[6, 3]], 0}
{15319, 5003}
{71, -Diag[ar[2, 1], ar[4, 6], ar[5, 3]] + Diag[ar[3, 2], ar[4, 6], ar[5, 1]] -
  Diag[ar[3, 6], ar[4, 1], ar[5, 2]] + Diag[ar[3, 6], ar[4, 2], ar[5, 1]], 0}
{72, -Diag[ar[2, 1], ar[5, 3], ar[6, 4]] + Diag[ar[3, 2], ar[5, 1], ar[6, 4]] -
  Diag[ar[4, 1], ar[5, 2], ar[6, 3]] + Diag[ar[4, 2], ar[5, 1], ar[6, 3]], 0}
{73, Diag[ar[1, 3], ar[2, 6], ar[4, 5]] + Diag[ar[1, 4], ar[2, 5], ar[3, 6]] -
  Diag[ar[1, 5], ar[2, 4], ar[3, 6]] - Diag[ar[1, 5], ar[2, 6], ar[3, 4]], 0}
{74, Diag[ar[1, 3], ar[4, 5], ar[6, 2]] + Diag[ar[1, 4], ar[2, 5], ar[6, 3]] -
  Diag[ar[1, 5], ar[2, 4], ar[6, 3]] - Diag[ar[1, 5], ar[3, 4], ar[6, 2]], 0}

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{75, Diag[ar[1, 3], ar[2, 6], ar[5, 4]] - Diag[ar[1, 4], ar[2, 5], ar[3, 6]] +
  Diag[ar[1, 5], ar[2, 4], ar[3, 6]] - Diag[ar[1, 5], ar[2, 6], ar[4, 3]], 0}
{76, Diag[ar[1, 3], ar[5, 4], ar[6, 2]] - Diag[ar[1, 4], ar[2, 5], ar[6, 3]] +
  Diag[ar[1, 5], ar[2, 4], ar[6, 3]] - Diag[ar[1, 5], ar[4, 3], ar[6, 2]], 0}
{77, -Diag[ar[1, 4], ar[2, 6], ar[3, 5]] + Diag[ar[1, 5], ar[2, 6], ar[3, 4]] -
  Diag[ar[1, 5], ar[3, 6], ar[4, 2]] + Diag[ar[2, 5], ar[3, 6], ar[4, 1]] +
  Diag[ar[2, 6], ar[3, 1], ar[4, 5]] - Diag[ar[2, 6], ar[3, 5], ar[4, 1]], 0}
{78, -Diag[ar[1, 4], ar[3, 5], ar[6, 2]] + Diag[ar[1, 5], ar[3, 4], ar[6, 2]] -
  Diag[ar[1, 5], ar[4, 2], ar[6, 3]] + Diag[ar[2, 5], ar[4, 1], ar[6, 3]] +
  Diag[ar[3, 1], ar[4, 5], ar[6, 2]] - Diag[ar[3, 5], ar[4, 1], ar[6, 2]], 0}
{79, -Diag[ar[2, 6], ar[3, 1], ar[4, 5]] + Diag[ar[2, 6], ar[3, 4], ar[5, 1]] +
  Diag[ar[3, 6], ar[4, 1], ar[5, 2]] - Diag[ar[3, 6], ar[4, 2], ar[5, 1]], 0}
{80, -Diag[ar[3, 1], ar[4, 5], ar[6, 2]] + Diag[ar[3, 4], ar[5, 1], ar[6, 2]] +
  Diag[ar[4, 1], ar[5, 2], ar[6, 3]] - Diag[ar[4, 2], ar[5, 1], ar[6, 3]], 0}
{81, -Diag[ar[1, 3], ar[2, 6], ar[5, 4]] + Diag[ar[1, 4], ar[2, 6], ar[5, 3]] -
  Diag[ar[1, 4], ar[3, 6], ar[5, 2]] + Diag[ar[2, 4], ar[3, 6], ar[5, 1]] +
  Diag[ar[2, 6], ar[4, 1], ar[5, 3]] - Diag[ar[2, 6], ar[4, 3], ar[5, 1]], 0}
{82, -Diag[ar[1, 3], ar[5, 4], ar[6, 2]] - Diag[ar[1, 4], ar[5, 2], ar[6, 3]] +
  Diag[ar[1, 4], ar[5, 3], ar[6, 2]] + Diag[ar[2, 4], ar[5, 1], ar[6, 3]] +
  Diag[ar[4, 1], ar[5, 3], ar[6, 2]] - Diag[ar[4, 3], ar[5, 1], ar[6, 2]], 0}
{83, -Diag[ar[2, 6], ar[3, 1], ar[5, 4]] + Diag[ar[2, 6], ar[4, 3], ar[5, 1]] -
  Diag[ar[3, 6], ar[4, 1], ar[5, 2]] + Diag[ar[3, 6], ar[4, 2], ar[5, 1]], 0}
{84, -Diag[ar[3, 1], ar[5, 4], ar[6, 2]] - Diag[ar[4, 1], ar[5, 2], ar[6, 3]] +
  Diag[ar[4, 2], ar[5, 1], ar[6, 3]] + Diag[ar[4, 3], ar[5, 1], ar[6, 2]], 0}
{85, Diag[ar[1, 2], ar[3, 6], ar[4, 5]] + Diag[ar[1, 5], ar[2, 6], ar[3, 4]] -
  Diag[ar[1, 6], ar[2, 3], ar[4, 5]] - Diag[ar[1, 6], ar[2, 5], ar[3, 4]], 0}
{86, Diag[ar[1, 2], ar[3, 6], ar[5, 4]] + Diag[ar[1, 5], ar[2, 6], ar[4, 3]] -
  Diag[ar[1, 6], ar[2, 3], ar[5, 4]] - Diag[ar[1, 6], ar[2, 5], ar[4, 3]], 0}
{87, Diag[ar[1, 2], ar[4, 5], ar[6, 3]] - Diag[ar[1, 3], ar[2, 6], ar[4, 5]] -
  Diag[ar[1, 3], ar[4, 5], ar[6, 2]] + Diag[ar[1, 5], ar[3, 4], ar[6, 2]] +
  Diag[ar[1, 6], ar[2, 3], ar[4, 5]] - Diag[ar[1, 6], ar[3, 4], ar[5, 2]], 0}
{88, Diag[ar[1, 2], ar[5, 4], ar[6, 3]] - Diag[ar[1, 3], ar[2, 6], ar[5, 4]] -
  Diag[ar[1, 3], ar[5, 4], ar[6, 2]] + Diag[ar[1, 5], ar[4, 3], ar[6, 2]] +
  Diag[ar[1, 6], ar[2, 3], ar[5, 4]] - Diag[ar[1, 6], ar[4, 3], ar[5, 2]], 0}
{89, -Diag[ar[1, 5], ar[2, 6], ar[3, 4]] + Diag[ar[1, 6], ar[2, 5], ar[3, 4]] -
  Diag[ar[1, 6], ar[3, 2], ar[4, 5]] + Diag[ar[2, 1], ar[3, 6], ar[4, 5]], 0}
{90, -Diag[ar[1, 5], ar[2, 6], ar[4, 3]] + Diag[ar[1, 6], ar[2, 5], ar[4, 3]] -
  Diag[ar[1, 6], ar[3, 2], ar[5, 4]] + Diag[ar[2, 1], ar[3, 6], ar[5, 4]], 0}
{91, -Diag[ar[2, 1], ar[3, 6], ar[4, 5]] + Diag[ar[2, 5], ar[3, 4], ar[6, 1]] +
  Diag[ar[2, 6], ar[3, 1], ar[4, 5]] - Diag[ar[2, 6], ar[3, 4], ar[5, 1]] +
  Diag[ar[3, 1], ar[4, 5], ar[6, 2]] - Diag[ar[3, 2], ar[4, 5], ar[6, 1]], 0}
{92, -Diag[ar[2, 1], ar[3, 6], ar[5, 4]] + Diag[ar[2, 5], ar[4, 3], ar[6, 1]] +
  Diag[ar[2, 6], ar[3, 1], ar[5, 4]] - Diag[ar[2, 6], ar[4, 3], ar[5, 1]] +
  Diag[ar[3, 1], ar[5, 4], ar[6, 2]] - Diag[ar[3, 2], ar[5, 4], ar[6, 1]], 0}
{93, -Diag[ar[1, 2], ar[4, 5], ar[6, 3]] + Diag[ar[2, 3], ar[4, 5], ar[6, 1]] +
  Diag[ar[3, 4], ar[5, 1], ar[6, 2]] - Diag[ar[3, 4], ar[5, 2], ar[6, 1]], 0}

```

```

{94, -Diag[ar[1, 2], ar[5, 4], ar[6, 3]] + Diag[ar[2, 3], ar[5, 4], ar[6, 1]] +
  Diag[ar[4, 3], ar[5, 1], ar[6, 2]] - Diag[ar[4, 3], ar[5, 2], ar[6, 1]], 0}
{95, -Diag[ar[2, 1], ar[4, 5], ar[6, 3]] + Diag[ar[3, 2], ar[4, 5], ar[6, 1]] -
  Diag[ar[3, 4], ar[5, 1], ar[6, 2]] + Diag[ar[3, 4], ar[5, 2], ar[6, 1]], 0}
{96, -Diag[ar[2, 1], ar[5, 4], ar[6, 3]] + Diag[ar[3, 2], ar[5, 4], ar[6, 1]] -
  Diag[ar[4, 3], ar[5, 1], ar[6, 2]] + Diag[ar[4, 3], ar[5, 2], ar[6, 1]], 0}
{97, Diag[ar[1, 3], ar[2, 5], ar[4, 6]] -
  Diag[ar[1, 4], ar[2, 5], ar[3, 6]] + Diag[ar[1, 4], ar[2, 6], ar[3, 5]] +
  Diag[ar[1, 5], ar[2, 4], ar[3, 6]] - 2 Diag[ar[1, 6], ar[2, 4], ar[3, 5]], 0}
{15 319, 4628}
{15 319, 4628}
{98, Diag[ar[1, 3], ar[4, 6], ar[5, 2]] + Diag[ar[1, 4], ar[2, 6], ar[5, 3]] -
  Diag[ar[1, 4], ar[3, 6], ar[5, 2]] + Diag[ar[1, 5], ar[3, 6], ar[4, 2]] -
  Diag[ar[1, 6], ar[2, 4], ar[5, 3]] - Diag[ar[1, 6], ar[3, 5], ar[4, 2]], 0}
{99, Diag[ar[1, 3], ar[2, 5], ar[6, 4]] - Diag[ar[1, 4], ar[2, 5], ar[6, 3]] -
  Diag[ar[1, 4], ar[2, 6], ar[3, 5]] + Diag[ar[1, 5], ar[2, 4], ar[6, 3]] +
  Diag[ar[1, 6], ar[2, 4], ar[3, 5]] - Diag[ar[1, 6], ar[2, 4], ar[5, 3]], 0}
{100, Diag[ar[1, 3], ar[5, 2], ar[6, 4]] - Diag[ar[1, 4], ar[2, 6], ar[5, 3]] -
  Diag[ar[1, 4], ar[5, 2], ar[6, 3]] + Diag[ar[1, 5], ar[4, 2], ar[6, 3]] +
  Diag[ar[1, 6], ar[2, 4], ar[5, 3]] - Diag[ar[1, 6], ar[4, 2], ar[5, 3]], 0}
{101, -Diag[ar[1, 5], ar[2, 4], ar[3, 6]] + Diag[ar[1, 6], ar[2, 4], ar[3, 5]] -
  Diag[ar[1, 6], ar[3, 5], ar[4, 2]] + Diag[ar[2, 5], ar[3, 1], ar[4, 6]] -
  Diag[ar[2, 5], ar[3, 6], ar[4, 1]] + Diag[ar[2, 6], ar[3, 5], ar[4, 1]], 0}
{102, -Diag[ar[1, 5], ar[3, 6], ar[4, 2]] + Diag[ar[1, 6], ar[3, 5], ar[4, 2]] -
  Diag[ar[1, 6], ar[4, 2], ar[5, 3]] + Diag[ar[2, 6], ar[4, 1], ar[5, 3]] +
  Diag[ar[3, 1], ar[4, 6], ar[5, 2]] - Diag[ar[3, 6], ar[4, 1], ar[5, 2]], 0}
{15 319, 5066}
{103, Diag[ar[2, 4], ar[3, 5], ar[6, 1]] - Diag[ar[2, 4], ar[3, 6], ar[5, 1]] -
  Diag[ar[2, 5], ar[3, 1], ar[4, 6]] + Diag[ar[2, 5], ar[3, 6], ar[4, 1]] +
  Diag[ar[3, 5], ar[4, 1], ar[6, 2]] - Diag[ar[3, 5], ar[4, 2], ar[6, 1]], 0}
{104, -Diag[ar[3, 1], ar[4, 6], ar[5, 2]] + Diag[ar[3, 5], ar[4, 2], ar[6, 1]] +
  Diag[ar[3, 6], ar[4, 1], ar[5, 2]] - Diag[ar[3, 6], ar[4, 2], ar[5, 1]] +
  Diag[ar[4, 1], ar[5, 3], ar[6, 2]] - Diag[ar[4, 2], ar[5, 3], ar[6, 1]], 0}
{15 319, 5066}
{105, -Diag[ar[1, 3], ar[2, 5], ar[6, 4]] + Diag[ar[1, 4], ar[2, 5], ar[6, 3]] -
  Diag[ar[1, 4], ar[3, 5], ar[6, 2]] + Diag[ar[2, 4], ar[3, 5], ar[6, 1]] +
  Diag[ar[2, 4], ar[5, 1], ar[6, 3]] - Diag[ar[2, 4], ar[5, 3], ar[6, 1]], 0}
{106, -Diag[ar[1, 3], ar[5, 2], ar[6, 4]] + Diag[ar[1, 4], ar[5, 2], ar[6, 3]] -
  Diag[ar[1, 4], ar[5, 3], ar[6, 2]] + Diag[ar[2, 4], ar[5, 3], ar[6, 1]] +
  Diag[ar[4, 2], ar[5, 1], ar[6, 3]] - Diag[ar[4, 2], ar[5, 3], ar[6, 1]], 0}
{107, -Diag[ar[2, 4], ar[5, 1], ar[6, 3]] + Diag[ar[2, 4], ar[5, 3], ar[6, 1]] -
  Diag[ar[2, 5], ar[3, 1], ar[6, 4]] + Diag[ar[2, 5], ar[4, 1], ar[6, 3]] -
  Diag[ar[3, 5], ar[4, 1], ar[6, 2]] + Diag[ar[3, 5], ar[4, 2], ar[6, 1]], 0}
{108, -Diag[ar[3, 1], ar[5, 2], ar[6, 4]] +
  Diag[ar[4, 1], ar[5, 2], ar[6, 3]] - Diag[ar[4, 1], ar[5, 3], ar[6, 2]] -
  Diag[ar[4, 2], ar[5, 1], ar[6, 3]] + 2 Diag[ar[4, 2], ar[5, 3], ar[6, 1]], 0}

```

```

{109, Diag[ar[1, 4], ar[2, 3], ar[5, 6]] + Diag[ar[1, 5], ar[2, 6], ar[3, 4]] -
  Diag[ar[1, 6], ar[2, 3], ar[4, 5]] - Diag[ar[1, 6], ar[2, 5], ar[3, 4]], 0}
{110, Diag[ar[1, 4], ar[3, 2], ar[5, 6]] + Diag[ar[1, 5], ar[2, 6], ar[4, 3]] -
  Diag[ar[1, 6], ar[2, 5], ar[4, 3]] - Diag[ar[1, 6], ar[3, 2], ar[4, 5]], 0}
{111, Diag[ar[1, 4], ar[2, 3], ar[6, 5]] - Diag[ar[1, 5], ar[2, 6], ar[3, 4]] -
  Diag[ar[1, 6], ar[2, 3], ar[5, 4]] + Diag[ar[1, 6], ar[2, 5], ar[3, 4]], 0}
{112, Diag[ar[1, 4], ar[3, 2], ar[6, 5]] - Diag[ar[1, 5], ar[2, 6], ar[4, 3]] +
  Diag[ar[1, 6], ar[2, 5], ar[4, 3]] - Diag[ar[1, 6], ar[3, 2], ar[5, 4]], 0}
{113, -Diag[ar[1, 5], ar[2, 3], ar[4, 6]] + Diag[ar[1, 6], ar[2, 3], ar[4, 5]] -
  Diag[ar[1, 6], ar[3, 4], ar[5, 2]] + Diag[ar[2, 3], ar[4, 1], ar[5, 6]] -
  Diag[ar[2, 3], ar[4, 6], ar[5, 1]] + Diag[ar[2, 6], ar[3, 4], ar[5, 1]], 0}
{114, -Diag[ar[1, 5], ar[3, 2], ar[4, 6]] + Diag[ar[1, 6], ar[3, 2], ar[4, 5]] -
  Diag[ar[1, 6], ar[4, 3], ar[5, 2]] + Diag[ar[2, 6], ar[4, 3], ar[5, 1]] +
  Diag[ar[3, 2], ar[4, 1], ar[5, 6]] - Diag[ar[3, 2], ar[4, 6], ar[5, 1]], 0}
{115, -Diag[ar[2, 3], ar[4, 1], ar[5, 6]] + Diag[ar[2, 3], ar[4, 5], ar[6, 1]] +
  Diag[ar[3, 4], ar[5, 1], ar[6, 2]] - Diag[ar[3, 4], ar[5, 2], ar[6, 1]], 0}
{116, -Diag[ar[3, 2], ar[4, 1], ar[5, 6]] + Diag[ar[3, 2], ar[4, 5], ar[6, 1]] +
  Diag[ar[4, 3], ar[5, 1], ar[6, 2]] - Diag[ar[4, 3], ar[5, 2], ar[6, 1]], 0}
{117, -Diag[ar[1, 4], ar[2, 3], ar[6, 5]] + Diag[ar[1, 5], ar[2, 3], ar[6, 4]] -
  Diag[ar[1, 5], ar[3, 4], ar[6, 2]] + Diag[ar[2, 3], ar[5, 1], ar[6, 4]] -
  Diag[ar[2, 3], ar[5, 4], ar[6, 1]] + Diag[ar[2, 5], ar[3, 4], ar[6, 1]], 0}
{118, -Diag[ar[1, 4], ar[3, 2], ar[6, 5]] + Diag[ar[1, 5], ar[3, 2], ar[6, 4]] -
  Diag[ar[1, 5], ar[4, 3], ar[6, 2]] + Diag[ar[2, 5], ar[4, 3], ar[6, 1]] +
  Diag[ar[3, 2], ar[5, 1], ar[6, 4]] - Diag[ar[3, 2], ar[5, 4], ar[6, 1]], 0}
{119, -Diag[ar[2, 3], ar[4, 1], ar[6, 5]] + Diag[ar[2, 3], ar[5, 4], ar[6, 1]] -
  Diag[ar[3, 4], ar[5, 1], ar[6, 2]] + Diag[ar[3, 4], ar[5, 2], ar[6, 1]], 0}
{120, -Diag[ar[3, 2], ar[4, 1], ar[6, 5]] + Diag[ar[3, 2], ar[5, 4], ar[6, 1]] -
  Diag[ar[4, 3], ar[5, 1], ar[6, 2]] + Diag[ar[4, 3], ar[5, 2], ar[6, 1]], 0}

{0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
  0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
  0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
  0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0}

```

Directory[]

/scratch/leung

**basis = BasisAArrow[4];**

```

For[index = 19, index ≤ Length[basis], index++,
  Print[index, " ", basis[[index]]];
  Timing[SaveUSp[basis[[index]]]]
];

```



```

19 Diag[ar[1, 7], ar[3, 5], ar[4, 8], ar[6, 2]]
Saving USpFor17354862.m ...
Computing OrderTypes[8, {{1, 2}, {3, 4}, {5, 6}, {7, 8}}]
Computing OrderTypes[8, {{3, 4}, {5, 6}, {7, 8}}]
Computing OrderTypes[8, {{5, 6}, {7, 8}}]
Computing OrderTypes[8, {{7, 8}}]
    $Aborted

    basis[[67]]
    Diag[ar[5, 3], ar[6, 2], ar[7, 1], ar[8, 4]]

    basis[[66]]
    Diag[ar[4, 8], ar[5, 3], ar[6, 2], ar[7, 1]]

    For[index = 67, index ≤ Length[basis], index++,
      Print[index, " ", basis[[index]]];
      Timing[SaveUSp[basis[[index]]]
];
67 Diag[ar[5, 3], ar[6, 2], ar[7, 1], ar[8, 4]]
Saving USpFor53627184.m ...
Computing OrderTypes[8, {{1, 2}, {3, 4}, {5, 6}, {7, 8}}]
Computing OrderTypes[8, {{3, 4}, {5, 6}, {7, 8}}]
Computing OrderTypes[8, {{5, 6}, {7, 8}}]
Computing OrderTypes[8, {{7, 8}}]
Computing OrderTypes[7, {{1, 2}, {3, 4}, {5, 6}}]
Computing OrderTypes[7, {{3, 4}, {5, 6}}]
Computing OrderTypes[7, {{5, 6}}]
Computing OrderTypes[6, {{1, 2}, {3, 4}}]
Computing OrderTypes[6, {{3, 4}}]
Computing OrderTypes[5, {{1, 2}}]
Computing OrderTypes[5, {{1, 2}, {3, 4}}]
Computing OrderTypes[5, {{3, 4}}]
Computing OrderTypes[4, {{1, 2}}]
Computing OrderTypes[3, {{1, 2}}]
Computing OrderTypes[7, {{1, 2}, {3, 4}, {6, 7}}]
Computing OrderTypes[7, {{3, 4}, {6, 7}}]
Computing OrderTypes[7, {{6, 7}}]
Computing OrderTypes[6, {{1, 2}, {5, 6}}]

```

```

Computing OrderTypes [6, {{5, 6}}]
Computing OrderTypes [5, {{4, 5}}]
Computing OrderTypes [5, {{1, 2}, {4, 5}}]
Computing OrderTypes [4, {{3, 4}}]
Computing OrderTypes [3, {{2, 3}}]
Computing OrderTypes [7, {{1, 2}, {4, 5}, {6, 7}}]
Computing OrderTypes [7, {{4, 5}, {6, 7}}]
Computing OrderTypes [6, {{3, 4}, {5, 6}}]
Computing OrderTypes [5, {{2, 3}, {4, 5}}]
Computing OrderTypes [7, {{2, 3}, {4, 5}, {6, 7}}]
{1861761, 225791}
68 Diag[ar[3, 8], ar[4, 5], ar[6, 2], ar[7, 1]]
Saving USpFor38456271.m ...
{1861761, 227414}
69 Diag[ar[3, 8], ar[5, 4], ar[6, 2], ar[7, 1]]
Saving USpFor38546271.m ...
{1861761, 230079}
70 Diag[ar[4, 5], ar[6, 2], ar[7, 1], ar[8, 3]]
Saving USpFor45627183.m ...
{1861761, 225386}
71 Diag[ar[5, 4], ar[6, 2], ar[7, 1], ar[8, 3]]
Saving USpFor54627183.m ...
$Aborted

basis[[19]]
Diag[ar[1, 7], ar[3, 5], ar[4, 8], ar[6, 2]]

basis

SetDirectory["/scratch/leung"]
/scratch/leung

Directory[]
/scratch/leung

```

```

SaveUSp[Diag[ar[5, 1], ar[6, 4], ar[7, 3], ar[8, 2]]];
SaveUSp[Diag[ar[5, 3], ar[6, 2], ar[7, 1], ar[8, 4]]];
For[index = 71, index ≤ Length[basis], index++,
  Print[index, " ", basis[[index]]];
  Timing[SaveUSp[basis[[index]]]
];

```

Saving USpFor51647382.m ...

{1861761, 225791}

Saving USpFor53627184.m ...

{1861761, 225791}

71 Diag[ar[5, 4], ar[6, 2], ar[7, 1], ar[8, 3]]

Saving USpFor54627183.m ...

{1861761, 225610}

72 Diag[ar[2, 8], ar[3, 5], ar[6, 4], ar[7, 1]]

Saving USpFor28356471.m ...

{1861761, 219569}

73 Diag[ar[2, 8], ar[4, 6], ar[5, 3], ar[7, 1]]

Saving USpFor28465371.m ...

{1861761, 223643}

74 Diag[ar[2, 8], ar[5, 3], ar[6, 4], ar[7, 1]]

Saving USpFor28536471.m ...

{1861761, 226759}

75 Diag[ar[2, 8], ar[3, 6], ar[4, 5], ar[7, 1]]

Saving USpFor28364571.m ...

{1861761, 204638}

76 Diag[ar[2, 8], ar[3, 6], ar[5, 4], ar[7, 1]]

Saving USpFor28365471.m ...

{1861761, 224474}

77 Diag[ar[2, 8], ar[4, 5], ar[6, 3], ar[7, 1]]

Saving USpFor28456371.m ...

{1861761, 224237}

78 Diag[ar[2, 8], ar[5, 4], ar[6, 3], ar[7, 1]]

Saving USpFor28546371.m ...

{1861761, 226937}

79 Diag[ar[3, 5], ar[6, 4], ar[7, 1], ar[8, 2]]

Saving USpFor35647182.m ...

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{1861761, 227140}
80 Diag[ar[4, 6], ar[5, 3], ar[7, 1], ar[8, 2]]
Saving USpFor46537182.m ...
{1861761, 227140}
81 Diag[ar[5, 3], ar[6, 4], ar[7, 1], ar[8, 2]]
Saving USpFor53647182.m ...
{1861761, 220858}
82 Diag[ar[3, 6], ar[4, 5], ar[7, 1], ar[8, 2]]
Saving USpFor36457182.m ...
{1861761, 219407}
83 Diag[ar[3, 6], ar[5, 4], ar[7, 1], ar[8, 2]]
Saving USpFor36547182.m ...
{1861761, 221094}
84 Diag[ar[4, 5], ar[6, 3], ar[7, 1], ar[8, 2]]
Saving USpFor45637182.m ...
{1861761, 221394}
85 Diag[ar[5, 4], ar[6, 3], ar[7, 1], ar[8, 2]]
Saving USpFor54637182.m ...
{1861761, 221410}
86 Diag[ar[1, 8], ar[5, 2], ar[6, 4], ar[7, 3]]
Saving USpFor18526473.m ...
{1861761, 224810}
87 Diag[ar[1, 8], ar[2, 6], ar[4, 7], ar[5, 3]]
Saving USpFor18264753.m ...
{1861761, 205261}
88 Diag[ar[1, 8], ar[2, 6], ar[5, 3], ar[7, 4]]
Saving USpFor18265374.m ...
{1861761, 227135}
89 Diag[ar[1, 8], ar[4, 3], ar[5, 7], ar[6, 2]]
Saving USpFor18435762.m ...
{1861761, 224651}
90 Diag[ar[1, 8], ar[4, 3], ar[6, 2], ar[7, 5]]
Saving USpFor18436275.m ...
{1861761, 222243}
91 Diag[ar[1, 8], ar[3, 5], ar[4, 7], ar[6, 2]]
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Saving USpFor18354762.m ...
{1861761, 206787}
92 Diag[ar[1, 8], ar[3, 5], ar[6, 2], ar[7, 4]]
Saving USpFor18356274.m ...
{1861761, 227888}
93 Diag[ar[1, 8], ar[4, 7], ar[5, 3], ar[6, 2]]
Saving USpFor18475362.m ...
{1861761, 226354}
94 Diag[ar[1, 8], ar[5, 3], ar[6, 2], ar[7, 4]]
Saving USpFor18536274.m ...
{1861761, 224849}
95 Diag[ar[1, 8], ar[3, 7], ar[4, 5], ar[6, 2]]
Saving USpFor18374562.m ...
{1861761, 204749}
96 Diag[ar[1, 8], ar[3, 7], ar[5, 4], ar[6, 2]]
Saving USpFor18375462.m ...
{1861761, 224559}
97 Diag[ar[1, 8], ar[4, 5], ar[6, 2], ar[7, 3]]
Saving USpFor18456273.m ...
{1861761, 218528}
98 Diag[ar[1, 8], ar[5, 4], ar[6, 2], ar[7, 3]]
Saving USpFor18546273.m ...
{1861761, 221175}
99 Diag[ar[1, 8], ar[2, 7], ar[3, 5], ar[6, 4]]
Saving USpFor18273564.m ...
{1861761, 201654}
100 Diag[ar[1, 8], ar[2, 7], ar[4, 6], ar[5, 3]]
Saving USpFor18274653.m ...
{1861761, 201654}
101 Diag[ar[1, 8], ar[2, 7], ar[5, 3], ar[6, 4]]
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102 Diag[ar[1, 8], ar[2, 7], ar[3, 6], ar[4, 5]]
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{1861761, 113135}
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103 Diag[ar[1, 8], ar[2, 7], ar[3, 6], ar[5, 4]]

Saving USpFor18273654.m ...

{1861761, 197010}

104 Diag[ar[1, 8], ar[2, 7], ar[4, 5], ar[6, 3]]

Saving USpFor18274563.m ...

{1861761, 199750}

105 Diag[ar[1, 8], ar[2, 7], ar[5, 4], ar[6, 3]]

Saving USpFor18275463.m ...

{1861761, 218589}

106 Diag[ar[1, 8], ar[3, 5], ar[6, 4], ar[7, 2]]

Saving USpFor18356472.m ...

{1861761, 224484}

107 Diag[ar[1, 8], ar[4, 6], ar[5, 3], ar[7, 2]]

Saving USpFor18465372.m ...

{1861761, 224484}

108 Diag[ar[1, 8], ar[5, 3], ar[6, 4], ar[7, 2]]

Saving USpFor18536472.m ...

{1861761, 221323}

109 Diag[ar[1, 8], ar[3, 6], ar[4, 5], ar[7, 2]]

Saving USpFor18364572.m ...

{1861761, 200030}

110 Diag[ar[1, 8], ar[3, 6], ar[5, 4], ar[7, 2]]

Saving USpFor18365472.m ...

{1861761, 218496}

111 Diag[ar[1, 8], ar[4, 5], ar[6, 3], ar[7, 2]]

Saving USpFor18456372.m ...

{1861761, 219372}

112 Diag[ar[1, 8], ar[5, 4], ar[6, 3], ar[7, 2]]

Saving USpFor18546372.m ...

{1861761, 221191}

113 Diag[ar[5, 2], ar[6, 4], ar[7, 3], ar[8, 1]]

Saving USpFor52647381.m ...

{1861761, 225712}

114 Diag[ar[2, 6], ar[4, 7], ar[5, 3], ar[8, 1]]

Saving USpFor26475381.m ...

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{1861761, 228184}
115 Diag[ar[2, 6], ar[5, 3], ar[7, 4], ar[8, 1]]
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    $Aborted

    SetDirectory ["/scratch/leung"]
    /scratch/leung

    Directory []
    /scratch/leung

    For[index = 115, index ≤ Length[basis], index++,
        Print[index, " ", basis[[index]]];
        Timing[SaveUSp[basis[[index]]]]
    ];
115 Diag[ar[2, 6], ar[5, 3], ar[7, 4], ar[8, 1]]
Saving USpFor26537481.m ...
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Computing OrderTypes[8, {{3, 4}, {5, 6}, {7, 8}}]
Computing OrderTypes[8, {{5, 6}, {7, 8}}]
Computing OrderTypes[8, {{7, 8}}]
Computing OrderTypes[7, {{1, 2}, {3, 4}, {5, 6}}]
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Computing OrderTypes[7, {{5, 6}}]
Computing OrderTypes[6, {{1, 2}, {3, 4}}]
Computing OrderTypes[6, {{3, 4}}]
Computing OrderTypes[5, {{1, 2}}]
Computing OrderTypes[5, {{1, 2}, {3, 4}}]
Computing OrderTypes[5, {{3, 4}}]
Computing OrderTypes[4, {{1, 2}}]
Computing OrderTypes[3, {{1, 2}}]
Computing OrderTypes[7, {{1, 2}, {3, 4}, {6, 7}}]
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Computing OrderTypes[5, {{1, 2}, {4, 5}}]

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Computing OrderTypes [3, {{2, 3}}]
Computing OrderTypes [7, {{1, 2}, {4, 5}, {6, 7}}]
Computing OrderTypes [7, {{4, 5}, {6, 7}}]
Computing OrderTypes [6, {{3, 4}, {5, 6}}]
Computing OrderTypes [5, {{2, 3}, {4, 5}}]
Computing OrderTypes [7, {{2, 3}, {4, 5}, {6, 7}}]
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{1861761, 227241}
117 Diag[ar[4, 3], ar[6, 2], ar[7, 5], ar[8, 1]]
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{1861761, 219728}
118 Diag[ar[3, 5], ar[4, 7], ar[6, 2], ar[8, 1]]
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{1861761, 228365}
119 Diag[ar[3, 5], ar[6, 2], ar[7, 4], ar[8, 1]]
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120 Diag[ar[4, 7], ar[5, 3], ar[6, 2], ar[8, 1]]
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121 Diag[ar[5, 3], ar[6, 2], ar[7, 4], ar[8, 1]]
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{1861761, 225729}
122 Diag[ar[3, 7], ar[4, 5], ar[6, 2], ar[8, 1]]
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123 Diag[ar[3, 7], ar[5, 4], ar[6, 2], ar[8, 1]]
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{1861761, 227774}
124 Diag[ar[4, 5], ar[6, 2], ar[7, 3], ar[8, 1]]
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{1861761, 221466}
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125 Diag[ar[5, 4], ar[6, 2], ar[7, 3], ar[8, 1]]

Saving USpFor54627381.m ...

{1861761, 221289}

126 Diag[ar[2, 7], ar[3, 5], ar[6, 4], ar[8, 1]]

Saving USpFor27356481.m ...

{1861761, 224395}

127 Diag[ar[2, 7], ar[4, 6], ar[5, 3], ar[8, 1]]

Saving USpFor27465381.m ...

{1861761, 224395}

128 Diag[ar[2, 7], ar[5, 3], ar[6, 4], ar[8, 1]]

Saving USpFor27536481.m ...

{1861761, 221320}

129 Diag[ar[2, 7], ar[3, 6], ar[4, 5], ar[8, 1]]

Saving USpFor27364581.m ...

{1861761, 200081}

130 Diag[ar[2, 7], ar[3, 6], ar[5, 4], ar[8, 1]]

Saving USpFor27365481.m ...

{1861761, 219435}

131 Diag[ar[2, 7], ar[4, 5], ar[6, 3], ar[8, 1]]

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{1861761, 219428}

132 Diag[ar[2, 7], ar[5, 4], ar[6, 3], ar[8, 1]]

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{1861761, 221428}

133 Diag[ar[3, 5], ar[6, 4], ar[7, 2], ar[8, 1]]

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{1861761, 227561}

134 Diag[ar[4, 6], ar[5, 3], ar[7, 2], ar[8, 1]]

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{1861761, 227561}

135 Diag[ar[5, 3], ar[6, 4], ar[7, 2], ar[8, 1]]

Saving USpFor53647281.m ...

{1861761, 221214}

136 Diag[ar[3, 6], ar[4, 5], ar[7, 2], ar[8, 1]]

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{1861761, 219387}

137 Diag[ar[3, 6], ar[5, 4], ar[7, 2], ar[8, 1]]

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{1861761, 221432}

138 Diag[ar[4, 5], ar[6, 3], ar[7, 2], ar[8, 1]]

Saving USpFor45637281.m ...

{1861761, 220609}

139 Diag[ar[5, 4], ar[6, 3], ar[7, 2], ar[8, 1]]

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{1861761, 218309}