In[2]:=
```
<< C:\drorbn\AcademicPensieve\Projects\Mathematica\LinAlg.m
```

In[3]:=
```
rrt1 = Total[(Signature[#] * (P1@#)) & /@ Permutations[{1, 2, 3}]];
rrt = Expand[rrt1 * (rrt1 /. P1 → P2)] /. P1[p1_] P2[p2_] :> (
    P @@ (p1 ~Join~ (p2 + 3)) - P @@ ((p1 + 3) ~Join~ p2)
   )
```

Out[4]=
$$P[1,2,3,4,5,6]-P[1,2,3,4,6,5]-P[1,2,3,5,4,6]+P[1,2,3,5,6,4]+P[1,2,3,6,4,5]-P[1,2,3,6,5,4]-P[1,3,2,4,5,6]+P[1,3,2,4,6,5]+P[1,3,2,5,4,6]-P[1,3,2,5,6,4]-P[1,3,2,6,4,5]+P[1,3,2,6,5,4]-P[2,1,3,4,5,6]+P[2,1,3,4,6,5]+P[2,1,3,5,4,6]-P[2,1,3,5,6,4]-P[2,1,3,6,4,5]+P[2,1,3,6,5,4]+P[2,3,1,4,5,6]-P[2,3,1,4,6,5]-P[2,3,1,5,4,6]+P[2,3,1,5,6,4]+P[2,3,1,6,4,5]-P[2,3,1,6,5,4]+P[3,1,2,4,5,6]-P[3,1,2,4,6,5]-P[3,1,2,5,4,6]+P[3,1,2,5,6,4]+P[3,1,2,6,4,5]-P[3,1,2,6,5,4]-P[3,2,1,4,5,6]+P[3,2,1,4,6,5]+P[3,2,1,5,4,6]-P[3,2,1,5,6,4]-P[3,2,1,6,4,5]+P[3,2,1,6,5,4]-P[4,5,6,1,2,3]+P[4,5,6,1,3,2]+P[4,5,6,2,1,3]-P[4,5,6,2,3,1]-P[4,5,6,3,1,2]+P[4,5,6,3,2,1]+P[4,6,5,1,2,3]-P[4,6,5,1,3,2]-P[4,6,5,2,1,3]+P[4,6,5,2,3,1]+P[4,6,5,3,1,2]-P[4,6,5,3,2,1]+P[5,4,6,1,2,3]-P[5,4,6,1,3,2]-P[5,4,6,2,1,3]+P[5,4,6,2,3,1]+P[5,4,6,3,1,2]-P[5,4,6,3,2,1]-P[5,6,4,1,2,3]+P[5,6,4,1,3,2]+P[5,6,4,2,1,3]-P[5,6,4,2,3,1]-P[5,6,4,3,1,2]+P[5,6,4,3,2,1]-P[6,4,5,1,2,3]+P[6,4,5,1,3,2]+P[6,4,5,2,1,3]-P[6,4,5,2,3,1]-P[6,4,5,3,1,2]+P[6,4,5,3,2,1]+P[6,5,4,1,2,3]-P[6,5,4,1,3,2]-P[6,5,4,2,1,3]+P[6,5,4,2,3,1]+P[6,5,4,3,1,2]-P[6,5,4,3,2,1]$$

In[5]:=
```
lam4[l_List] := Total[
   (P[1, 2, 3, 4, 5, 6] /. Thread[l → #] & /@ Permutations[l]) /.
    p_P :> Signature[p] * p
  ];
lam4[i_, j_] := lam4[Complement[Range[6], {i, j}]];
```

In[7]:=
```
lam4[3, 5]
```

Out[7]=
$$P[1,2,3,4,5,6]-P[1,2,3,6,5,4]-P[1,4,3,2,5,6]+P[1,4,3,6,5,2]+P[1,6,3,2,5,4]-P[1,6,3,4,5,2]-P[2,1,3,4,5,6]+P[2,1,3,6,5,4]+P[2,4,3,1,5,6]-P[2,4,3,6,5,1]-P[2,6,3,1,5,4]+P[2,6,3,4,5,1]+P[4,1,3,2,5,6]-P[4,1,3,6,5,2]-P[4,2,3,1,5,6]+P[4,2,3,6,5,1]+P[4,6,3,1,5,2]-P[4,6,3,2,5,1]-P[6,1,3,2,5,4]+P[6,1,3,4,5,2]+P[6,2,3,1,5,4]-P[6,2,3,4,5,1]-P[6,4,3,1,5,2]+P[6,4,3,2,5,1]$$

In[8]:=
```
AllPs = (P @@ #) & /@ Permutations[{1, 2, 3, 4, 5, 6}];
```

In[9]:=
```
LC2SA[AllPs, {lam4[3, 5]}]
```

Out[9]=
```
SparseArray[<24>, {1, 720}]
```