

Pensieve header: Converting between PDs and GCs, for Lou Kauffman.

Dear Dror,

Do you have a Gauss Code ----> PD Code
translator in Mathematica that works for virtual knots?

Best,
Lou

Lou -

“Virtual Knots” are honest knots minus error checking. So the silliest conversion program would do - all you have to do is NOT check for planarity.

Best,

Dror.

```
<< KnotTheory`
```

```
Loading KnotTheory` version of August 22, 2010, 13:36:57.55.  
Read more at http://katlas.org/wiki/KnotTheory.
```

```
GC[K_] := GC @@ (  
  PD[K] /. X[i_, j_, k_, l_] => If[PositiveQ[X[i, j, k, l]],  
    Ar[1, i, +1], Ar[j, i, -1]  
  ]  
);
```

```
PD[gc_GC] := (PD@gc) /. {  
  Ar[i_, j_, +1] => X[j, i+1, j+1, i],  
  Ar[i_, j_, -1] => X[j, i, j+1, i+1]  
} /. 2 Length[gc] + 1 -> 1;
```

```
pd = PD[Knot[8, 17]]
```

```
KnotTheory::loading: Loading precomputed data in PD4Knots`.
```

```
PD[X[6, 2, 7, 1], X[14, 8, 15, 7], X[8, 3, 9, 4], X[2, 13, 3, 14],  
  X[12, 5, 13, 6], X[4, 9, 5, 10], X[16, 12, 1, 11], X[10, 16, 11, 15]]
```

```
gc = GC[pd]
```

```
GC[Ar[1, 6, 1], Ar[7, 14, 1], Ar[3, 8, -1], Ar[13, 2, -1],  
  Ar[5, 12, -1], Ar[9, 4, -1], Ar[11, 16, 1], Ar[15, 10, 1]]
```

```
PD[gc]
```

```
PD[X[6, 2, 7, 1], X[14, 8, 15, 7], X[8, 3, 9, 4], X[2, 13, 3, 14],  
  X[12, 5, 13, 6], X[4, 9, 5, 10], X[16, 12, 1, 11], X[10, 16, 11, 15]]
```

```
PD[gc] == pd
```

```
True
```