

In[]:= << KnotTheory`

Loading KnotTheory` version of February 2, 2020, 10:53:45.2097.
 Read more at <http://katlas.org/wiki/KnotTheory>.

In[]:= Kh[PD@Mirror[Knot[3, 1]]][q, t]

 KnotTheory: Loading precomputed data in PD4Knots` 

 KnotTheory: The Khovanov homology program JavaKh-v2 is an update of Jeremy Green's program JavaKh-v1, written by 

Scott Morrison in 2008 at Microsoft Station Q.

Out[]:= $q + q^3 + q^5 t^2 + q^9 t^3$

In[]:= Kh[PD@Mirror[Knot[3, 1]]][q, t] /. t -> -1

Out[]:= $q + q^3 + q^5 - q^9$

In[]:= Kh[PD@Knot[5, 1]][q, t]
 Kh[PD@Knot[10, 132]][q, t]

Out[]:= $\frac{1}{q^5} + \frac{1}{q^3} + \frac{1}{q^{15} t^5} + \frac{1}{q^{11} t^4} + \frac{1}{q^{11} t^3} + \frac{1}{q^7 t^2}$

Out[]:= $\frac{1}{q^3} + \frac{1}{q} + \frac{1}{q^{15} t^7} + \frac{1}{q^{11} t^6} + \frac{1}{q^{11} t^5} + \frac{1}{q^9 t^4} + \frac{1}{q^7 t^4} + \frac{1}{q^9 t^3} + \frac{1}{q^5 t^3} + \frac{2}{q^5 t^2} + \frac{1}{q t}$

In[]:= Kh[PD@Knot[5, 1]][q, t] /. t -> -1
 Kh[PD@Knot[10, 132]][q, t] /. t -> -1

Out[]:= $-\frac{1}{q^{15}} + \frac{1}{q^7} + \frac{1}{q^5} + \frac{1}{q^3}$

Out[]:= $-\frac{1}{q^{15}} + \frac{1}{q^7} + \frac{1}{q^5} + \frac{1}{q^3}$

I mean business.

In 1 day



says

$T(7,6)$



Old techniques:

~1,000 years,
~1Ggb RAM.

(now down to seconds)

$\dim_j H_r$ is given by:

$j \setminus r$	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
57																	1			1
55																	1	1		
53															1	2		1	1	
51												1	1		2		1			
49														3	1		1			
47												3	1		1					
45										2		1	2							
43								1		1	2									
41						1		1	2		1									
39						1	1		1											
37				1	1															
35					1															
33			1																	
31	1																			
29	1																			

the alternating knots zone

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In[ ]:= stime = CurrentDate[];
Kh[PD@TorusKnot[7, 6]][q, t]
CurrentDate[] - stime
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$$\begin{aligned}
 \text{Out[]} = & q^{29} + q^{31} + q^{33} t^2 + q^{37} t^3 + q^{35} t^4 + q^{37} t^4 + q^{39} t^5 + q^{41} t^5 + q^{37} t^6 + q^{39} t^6 + q^{41} t^7 + \\
 & q^{43} t^7 + q^{39} t^8 + 2 q^{41} t^8 + q^{43} t^9 + 2 q^{45} t^9 + q^{41} t^{10} + 2 q^{43} t^{10} + q^{45} t^{11} + 3 q^{47} t^{11} + \\
 & 2 q^{45} t^{12} + q^{47} t^{12} + q^{51} t^{12} + 3 q^{49} t^{13} + q^{51} t^{13} + q^{47} t^{14} + q^{49} t^{14} + q^{53} t^{14} + 2 q^{51} t^{15} + \\
 & 2 q^{53} t^{15} + q^{49} t^{16} + q^{51} t^{16} + q^{55} t^{16} + q^{57} t^{16} + q^{53} t^{17} + q^{55} t^{17} + q^{53} t^{18} + q^{57} t^{19}
 \end{aligned}$$

Out[] = 5.20618 s

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In[ ]:= Crossings[TorusKnot[7, 6]]
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Out[] = 35