

```
Switch[Online,
Online, ideal = Import["http://katlas.org/w/images/d/d2/Ideal.txt.gz", "String"],
Offline, ideal = Import["C:\\drorbn\\People\\Gilbert\\ideal.txt", "String"]
]
```

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

```
<DATA>

<COMMENT Title="Database of Ideal knots, 3-10 crossings" />

<COMMENT Author="Brian Gilbert" />

<COMMENT Date="2/01/2009 3:17:33 p.m." />

<AB Id="3:1:1" Conway="3" L="16.372861" D=" 1.000000">

  <Co ... -0.000023" />

  <Coeff I=" 99" A="-0.000012,-0.000101, 0.000023" B=" 0.000008, 0.000021,-0.000095" />

  <Coeff I="100" A="-0.000019, 0.000053, 0.000013" B="-0.000009,-0.000046,-0.000075" />

</AB>

</DATA>
```

Show Less

Show More

Show Full Output

Set Size Limit...

```
(* ideall=Import["C:\\drorbn\\People\\Gilbert\\ideal.txt", "String"]
ideal="<data><>StringReplace[ideall,
  "I=~" "...~ i:(DigitCharacter..) => "I=\"\"<i>\"\""]<>"</data>"; *)

data = Cases[ImportString[ideal, "XML"], XMLElement["AB", ab__] => AB[ab], Infinity];
```

```
Length[data]
```

```
250
```

```
ProcessAB[ab_AB] := Module[
  {Id, CS, L, n, c, k, K, coeffs},
  {Id, CS, L} = {"Id", "Conway", "L"} /. ab[[1]];
  {n, c, k} = ToExpression /@ StringSplit[Id, ":"];
  If[n == 10 && 161 < k ≤ 166, --k];
  K = Knot[n, k];
  coeffs = ab[[2]] /. XMLElement["Coeff", l_List, {}] => {
    ToExpression["I" /. l],
    ToExpression["{" <> ("A" /. l) <> "}"],
    ToExpression["{" <> ("B" /. l) <> "}"]
  };
  If[c == 1,
    RopeLength[K] = ToExpression[L];
    ConwayString[K] = CS;
    IdealPresentationData[K] = coeffs;
    K,
    Print["Trouble in ", K]
  ]
];

IdealPresentation[K_Knot][t_] := Plus @@ (IdealPresentationData[K] /.
  {i_, A_List, B_List} => A Cos[i t] + B Sin[i t]
)

Ks = Union[ProcessAB /@ data];

Max[RopeLength /@ Ks]

46.2629

RopeLength[Knot[0, 1]] = N[Pi];
IdealPresentationData[Knot[0, 1]] = {{1, {1, 0, 0}, {0, 1, 0}}};

(* ParametricPlot3D[IdealPresentation[Knot[3,1]][t], {t, 0, 2Pi}] *)
```

```

l = Length[Ks]

249

Clear[DrawKnot];
RandomUnitVector[] := (
  v = {1.15 * Random[], Random[], Random[]};
  v / Sqrt[v.v]
);
RandomColor[] := RGBColor @@ RandomUnitVector[];
DrawKnot[K_Knot] := DrawKnot[K] = ImageCrop[Rasterize[Graphics3D[{
  Specularity[Random[], 20 Random[]],
  {X1, X2, X3} = Compile[{t}, #] & /@ IdealPresentation[K][t];
  T = 8 RopeLength[K];
  Tube[
    Table[{X1[2 Pi k / T], X2[2 Pi k / T], X3[2 Pi k / T]}, {k, 0, T}], 0.1 + 0.4 Random[]]
  },
  Boxed → False, Background → Black, ImagePadding → None,
  PlotRangePadding → 0,
  ViewPoint → 10 RandomUnitVector[],
  Lighting → {
    {"Directional", RandomColor[], RandomUnitVector[]},
    {"Point", RandomColor[], 2 RandomUnitVector[]}
  }
}]]];

```

```
SeedRandom[0];
im = Rasterize[GraphicsGrid[
  Partition[
    Join[
      DrawKnot /@ {Knot[0, 1]},
      DrawKnot /@ Ks,
      {Graphics[{Yellow, Text[Style[
        Column[{
          "Knotted Candies by Dror Bar-Natan (2008)",
          "based on data by Brian Gilbert",
          "http://www.math.toronto.edu/~drorbn/Gallery/KnottedObjects/Candies/"
        ], Center
        ], 40
      ]}}]},
      Table[SpanFromLeft, {5}]
    ], 16
  ],
  Background -> Black, Spacings -> 0
], ImageSize -> 3200, RasterSize -> 3200, Background -> Black];
Show[ImageResize[im, 400]]
```



```
Export["C:/drorbn/AcademicPensieve/2008-12/KnottedCandies.png", im];
Export[
  "C:/drorbn/AcademicPensieve/2008-12/KnottedCandies_720.png", ImageResize[im, 720];
```

```
Export["C:/drorbn/AcademicPensieve/2008-12/KnottedCandies_120.png",  
ImageResize[ImageTake[im, -800, 800], 120]]
```

C:/drorbn/AcademicPensieve/2008-12/KnottedCandies_120.png