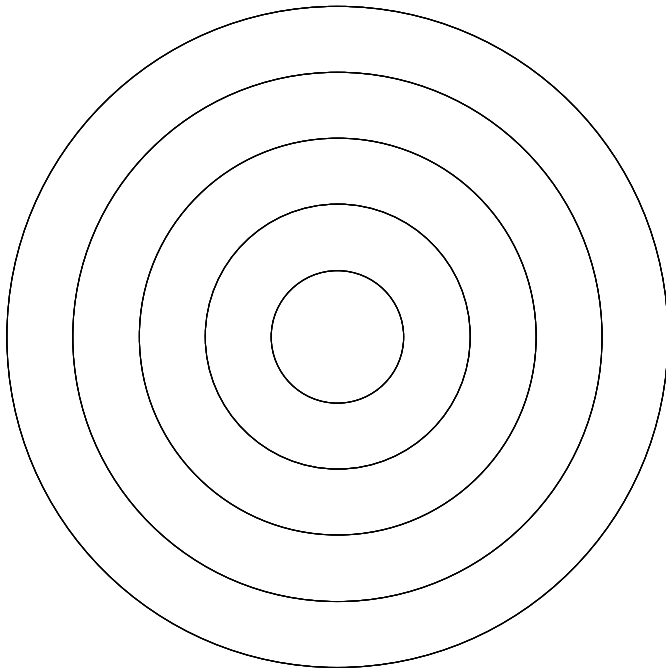


Harper — PS 5 — 2025-02-04

EIWL3 Sections 14 and 17

Section 14

```
In[105]:= Graphics[Table[Circle[{0, 0}, r], 5, {r, 1, 5, 1}]]  
Out[105]=
```



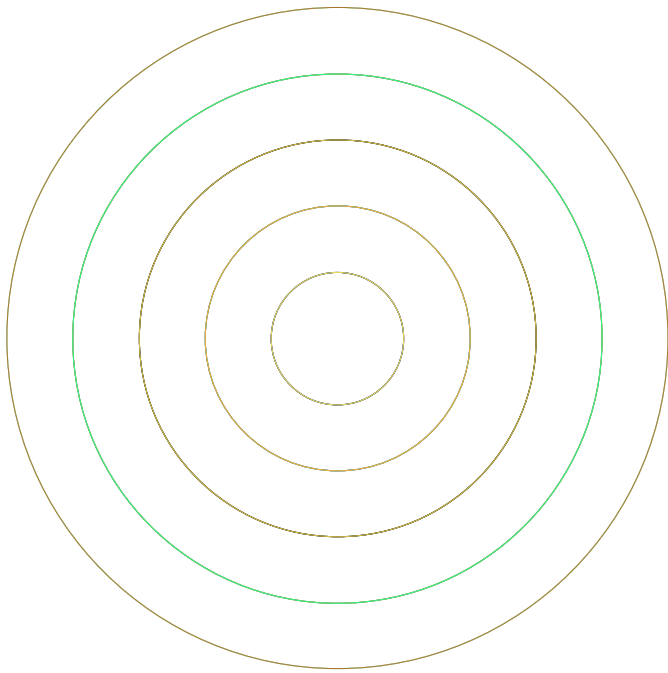
Great! See comment on
p. 5.

8/8

In[106]:=

```
Graphics[Table[Style[Circle[{0, 0}, r], RandomColor[]], 5, {r, 1, 5, 1}]]
```

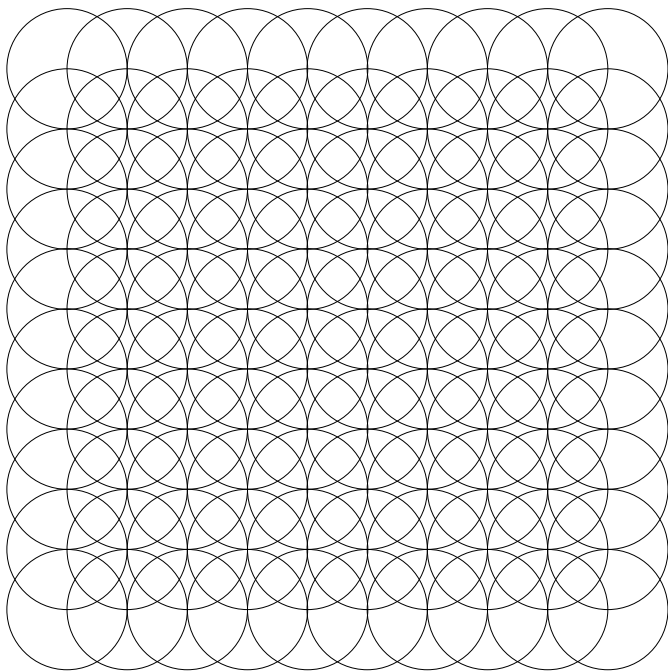
Out[106]=



In[107]:=

```
Graphics[Table[Circle[{x, y}, 1], {x, 1, 10, 1}, {y, 1, 10, 1}]]
```

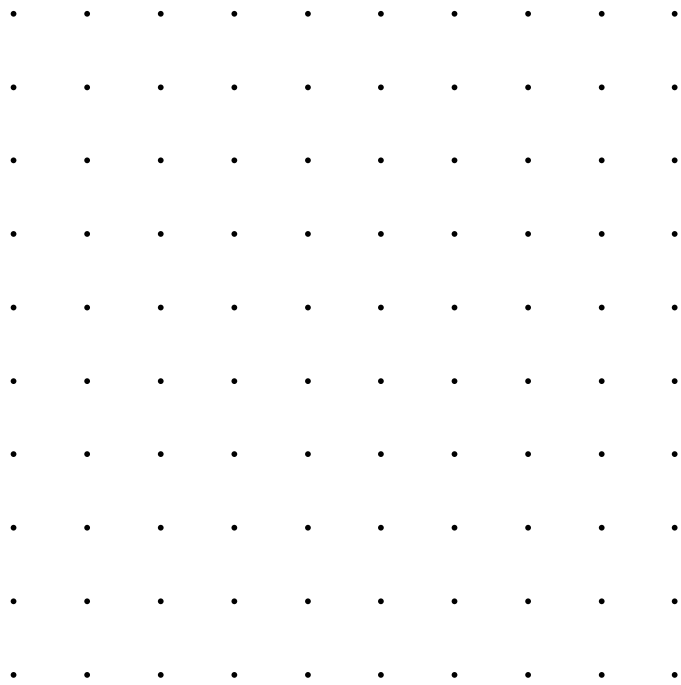
Out[107]=



In[108]:=

Graphics[Table[Point[{x, y}], {x, 1, 10, 1}, {y, 1, 10, 1}]]

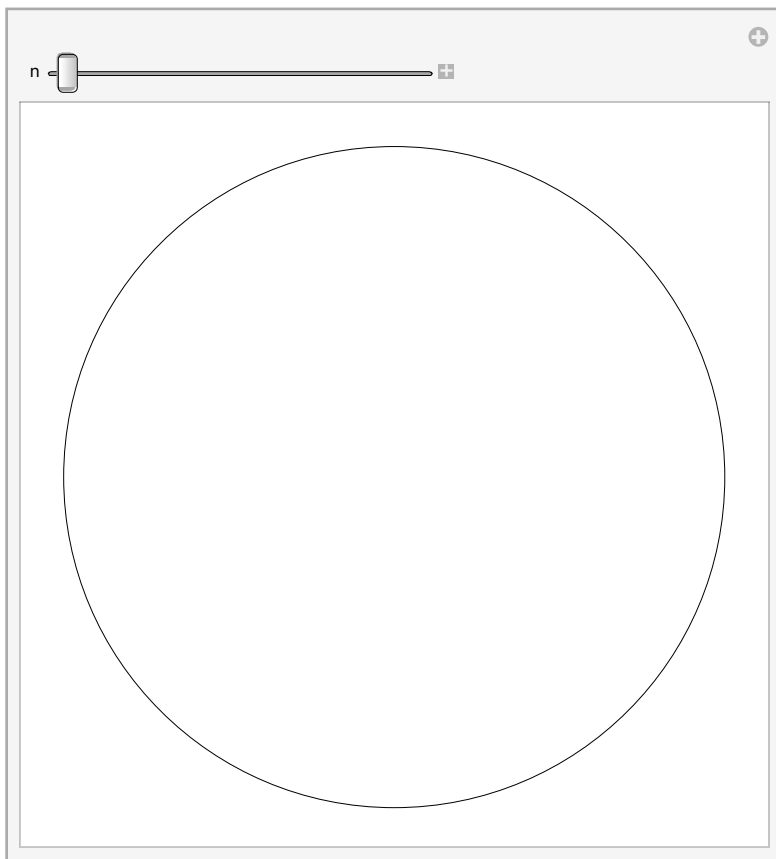
Out[108]=



In[109]:=

Manipulate[Graphics[Table[Circle[{0, 0}, x], {x, n}]], {n, 1, 20, 1}]

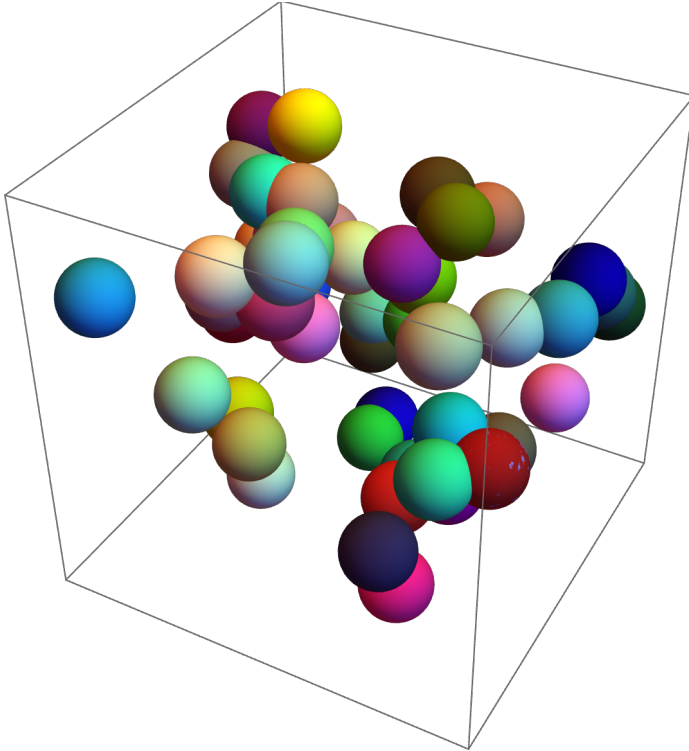
Out[109]=



In[110]:=

```
Graphics3D[
  Table[Style[Sphere[{RandomInteger[10], RandomInteger[10], RandomInteger[10]}],
    RandomColor[], 50]]
```

Out[110]=



```
(*Graphics3D[Table[Style[Sphere[{x,y,z},0.5],RGBColor[r,g,b]],
  {x,1,11,1},{y,1,11,1},{z,1,11,1},{r,0,1,0.1},{g,0,1,0.1},{b,0,1,0.1}]]*)
```

Out[111]=

\$Aborted

(*I cannot figure out how to do this one*)

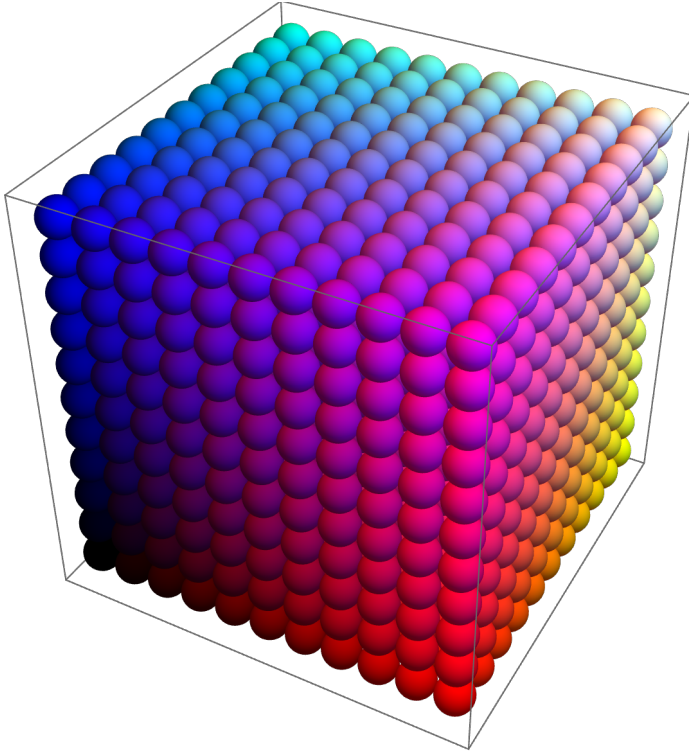
(* Here is my 14.7 *)

I added my solution to 14.7 to your notebook. Your solution above was really bogging down my computer so I commented it out. We haven't talked about performance yet. The issue is that the way you are doing it creates $11 * 11 * 11 * 11 * 11 * 11$ objects rather than $11 * 11 * 11$ objects. My solution is on the next page. Apparently drawing 11^6 spheres is just too much even for a computer with 36GB.

In[112]:=

```
(* 14.7 *) Graphics3D[Table[  
  Style[Sphere[{x, y, z}, 1/2], RGBColor[x/10, y/10, z/10]],  
  {x, 0, 10}, {y, 0, 10}, {z, 0, 10}]]
```

Out[112]=

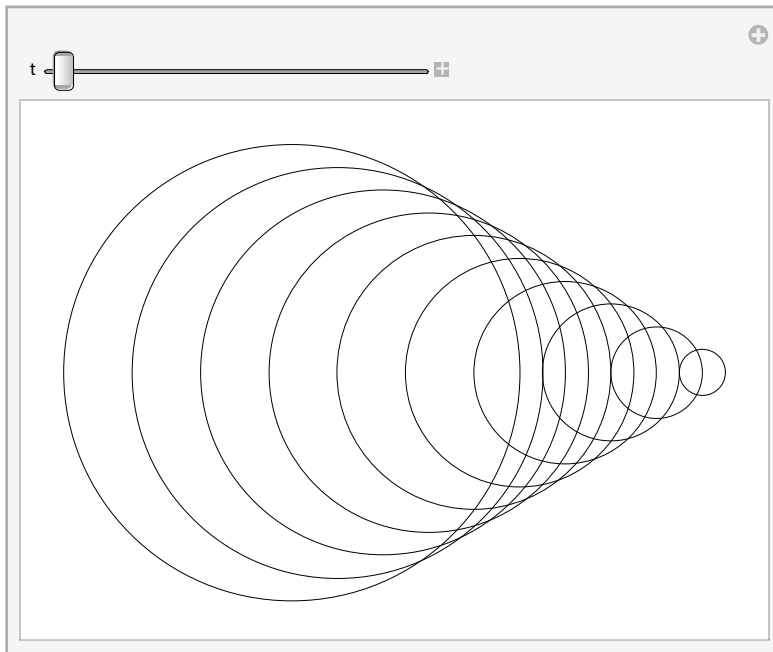


In[113]:=

In[114]:=

```
Manipulate[Graphics[Table[Circle[{t*x, 0}, x], {x, 1, 10}]], {t, -2, 2}]
```

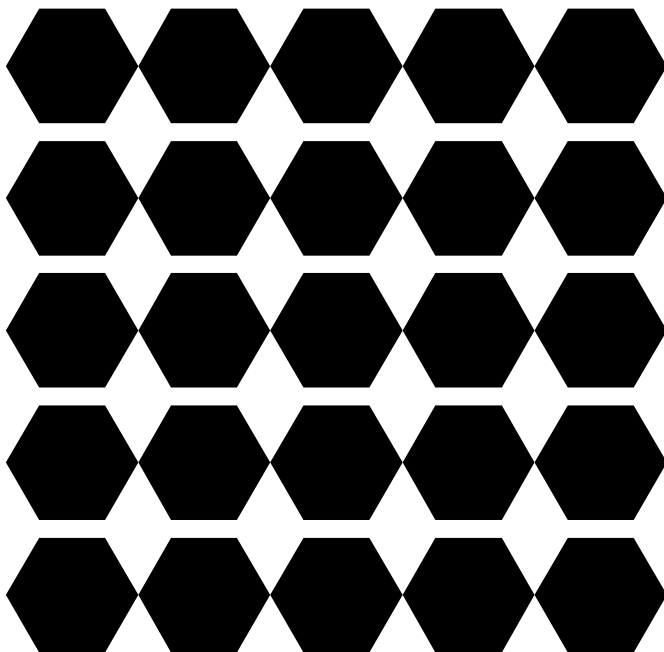
Out[114]=



In[115]:=

```
Graphics[Table[RegularPolygon[{x, y}, 0.5, 6], {x, 1, 5}, {y, 1, 5}]]
```

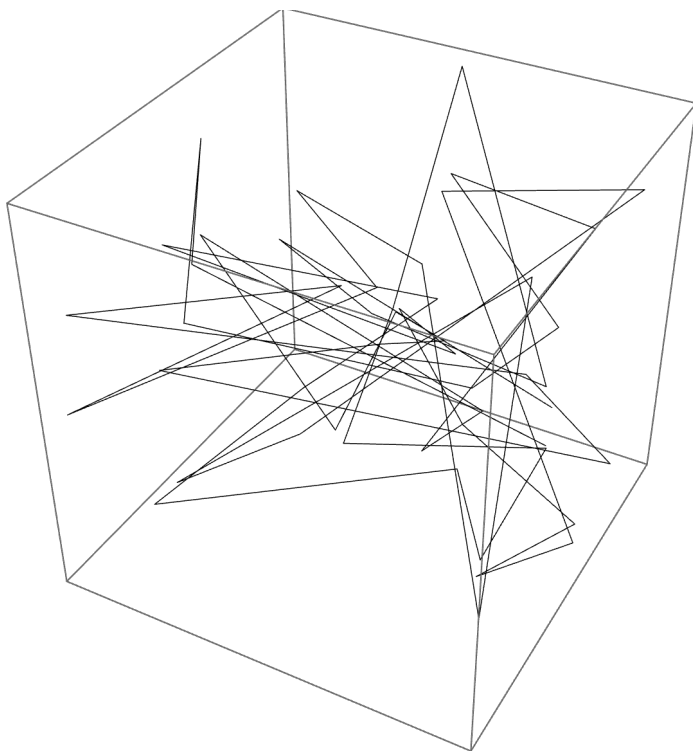
Out[115]=



In[116]:=

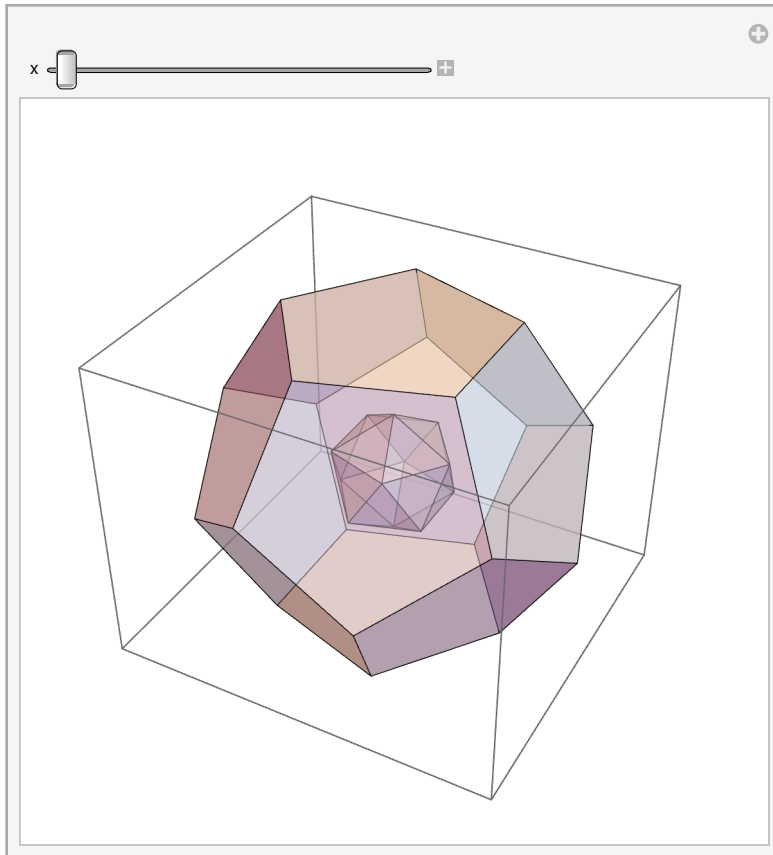
Graphics3D[Line[Table[RandomInteger[50], 50, 3]]]

Out[116]=




```
In[117]:= Manipulate[Graphics3D[Style[
  {Dodecahedron[{0, 0, 0}, 2], Icosahedron[{0, 0, 0}, x]}, Opacity[0.5]]], {x, 1, 2}]
```

Out[117]=



Section 17

```
In[118]:= UnitConvert[4.5 lb, "Kilograms"]
```

Out[118]= 2.04117 kg

```
In[119]:= UnitConvert[60.25 mi/h, "km/h"]
```

Out[119]= 96.963 km/h

```
In[120]:= UnitConvert[Eiffel Tower BUILDING [total height], "Miles"]
```

Out[120]= 0.205052 mi

In[121]:=



Out[121]=

26.8147

In[122]:=



Out[122]=

81.3

In[123]:=

CurrencyConvert[, "USDollars"]

Out[123]=

\$16.44


In[124]:=

UnitConvert[35 oz + 0.25 sh tn + 45 lb + 9 stone, "Kilograms"]

Out[124]=

305.353 kg

In[125]:=

UnitConvert[, ["DistanceFromEarth"], "LightMinutes"]

Out[125]=

```
{ 11.4192 light minutes, 3.6636 light minutes,
  0. light minutes, 6.19719 light minutes, 39.2378 light minutes,
  87.3816 light minutes, 162.485 light minutes, 255.371 light minutes }
```

In[126]:=

Rotate["hello", 180 Degree]

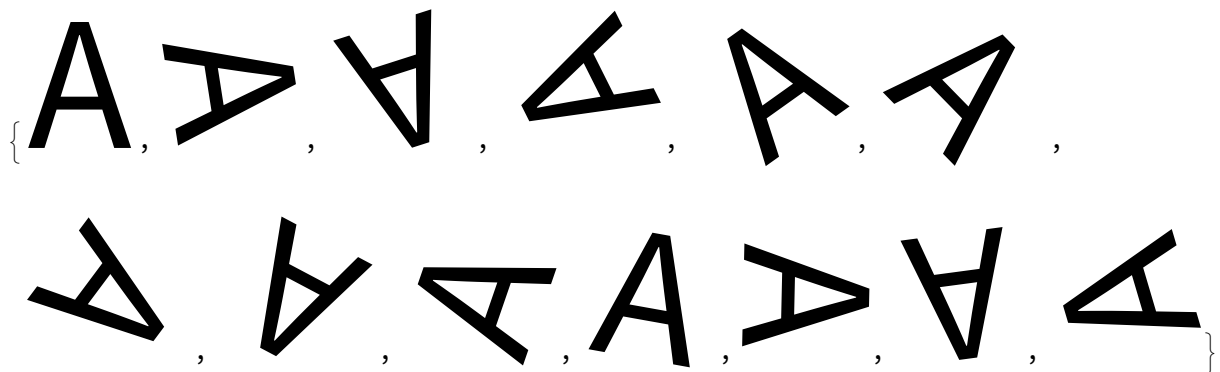
Out[126]=

oɹɹəʎ

In[127]:=

Table[Rotate[Style["A", 100], d], {d, 0, 360, 30}]

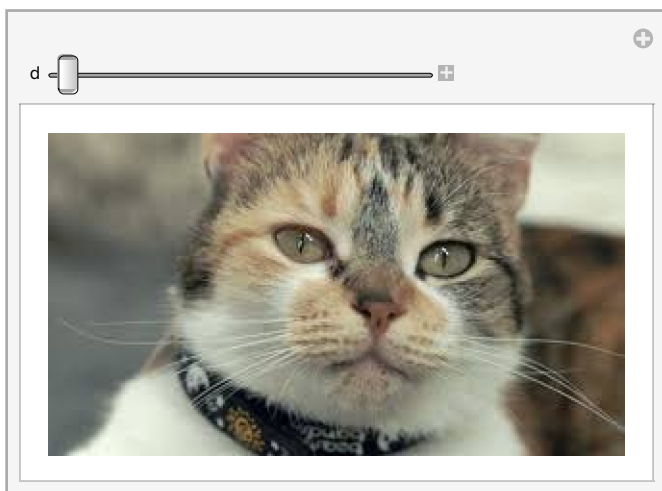
Out[127]=



In[128]:=

```
Manipulate[Rotate[, d], {d, 0, 180}]
```

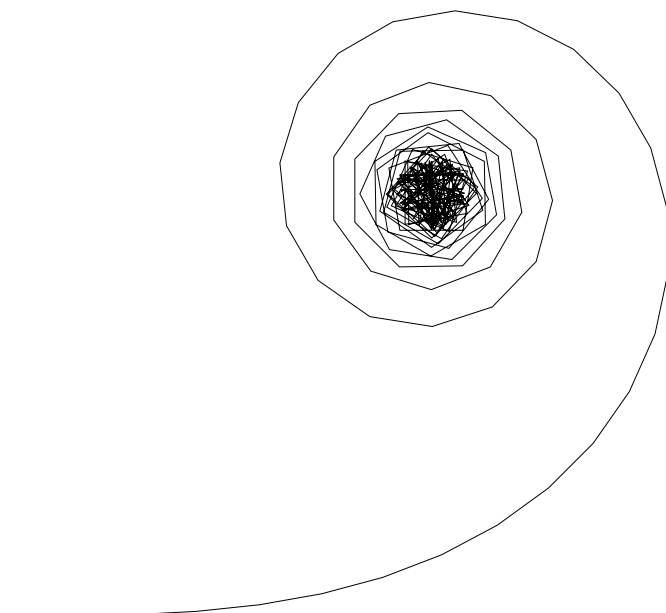
Out[128]=



In[129]:=

```
Graphics[Line[AnglePath[Table[n Degree, {n, 0, 180}]]]]
```

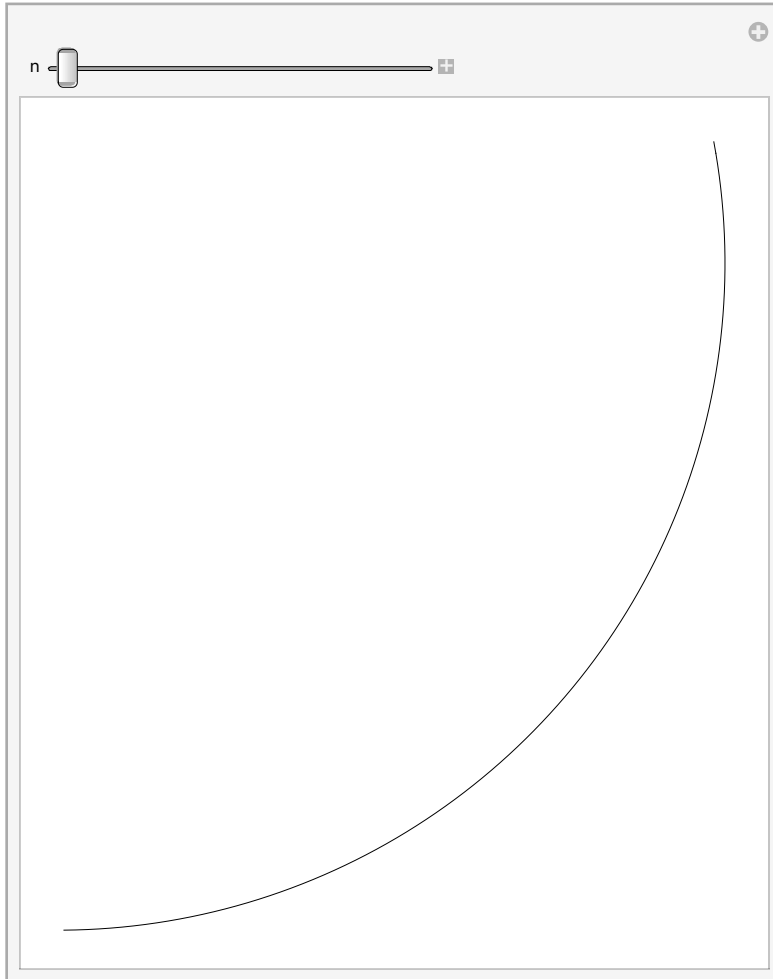
Out[129]=



In[130]:=

```
Manipulate[Graphics[Line[AnglePath[Table[Degree n, 100]]]], {n, 1, 100}]
```

Out[130]=

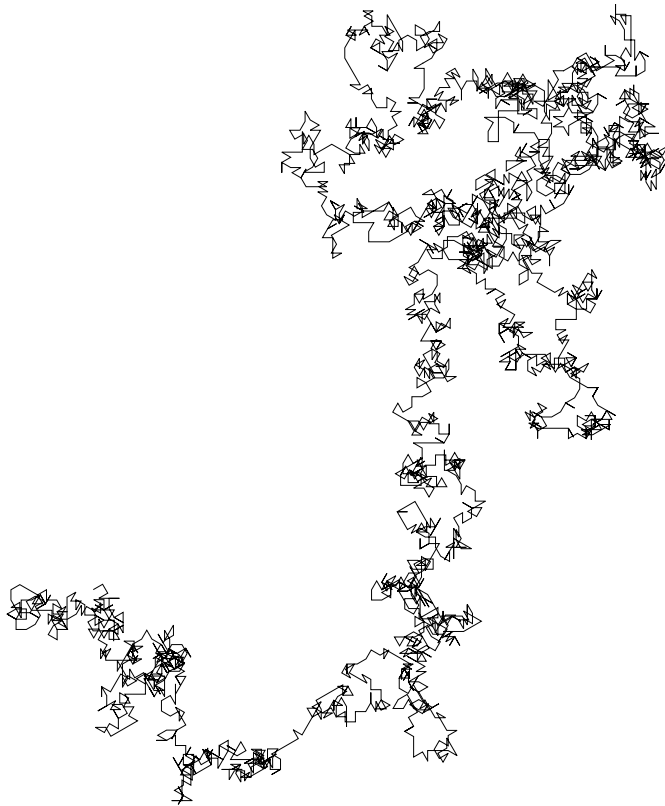


I loved the way this
thing curled up as
you move the slider.

In[131]:=

```
Graphics[Line[AnglePath[30 Degree IntegerDigits[2^10 000]]]]
```

Out[131]=



This one I also found artful.

Some Research and a Graph

In[132]:=

```
New York City CITY ... ✓ ["Image"]
```

Out[132]=

```
Missing[UnknownProperty, {City, Image}]
```

In[133]:=

```
Table[Part[GeoEntities[Portland CITY, "ZIPCode"], x][
  "PopulationDensity"], {x, 53}]
```

Out[133]=

```
{ 1702.32 people/km², 1201.94 people/km², 3260.25 people/km², 2313.52 people/km²,
  962.939 people/km², 1167.57 people/km², 3510.83 people/km², 3055.61 people/km²,
  Missing[NotApplicable], Missing[NotApplicable], 7219.34 people/km²,
  521.624 people/km², 1418.15 people/km², 3758.7 people/km², 2992.68 people/km²,
  3613.14 people/km², 2974.53 people/km², 2683.8 people/km², 913.904 people/km²,
  845.178 people/km², 1364.87 people/km², 1498.46 people/km², 1122.79 people/km²,
  1570.66 people/km², 1742.48 people/km², 1547.11 people/km², Missing[NotApplicable],
  1445.95 people/km², 825.1 people/km², 22.0078 people/km², 3128.97 people/km²,
  3447.89 people/km², 2005.41 people/km², Missing[NotApplicable], 1884.18 people/km²,
  Missing[NotApplicable], Missing[NotApplicable], Missing[NotApplicable],
  Missing[NotApplicable], Missing[NotApplicable], Missing[NotApplicable],
  Missing[NotApplicable], Missing[NotApplicable], 2292.67 people/km²,
  Missing[NotApplicable], Missing[NotApplicable], Missing[NotApplicable],
  Missing[NotApplicable], Missing[NotApplicable], Missing[NotApplicable],
  Missing[NotApplicable], Missing[NotApplicable], Missing[NotApplicable]}
```

In[134]:=

```
Table[Part[GeoEntities[Portland CITY, "ZIPCode"], x][
  "AverageHouseValue"], {x, 35}]
```

Out[134]=

```
{ $596400.00, $543700.00, $602400.00, $597400.00, $392300.00,
  Missing[NotApplicable], $554500.00, $400800.00, Missing[NotApplicable],
  Missing[NotApplicable], $555000.00, $801300.00, $530100.00, $695300.00,
  $501000.00, $642200.00, $575300.00, $351000.00, $464100.00, $406300.00,
  $556500.00, $362700.00, $657000.00, $375900.00, $459400.00,
  $540900.00, Missing[NotApplicable], $600700.00, $350800.00, $725100.00,
  $660000.00, $299500.00, $334800.00, Missing[NotApplicable], $628100.00 }
```

In[135]:=

```
Table[Part[GeoEntities[Portland CITY, "ZIPCode"], x][
  "PersonsPerHousehold"], {x, 35}]
```

Out[135]=

```
{ 2.32 people , 2.78 people , 1.68 people , 2.16 people , 2.47 people , 1.36 people ,
  1.44 people , 2.4 people , Missing[NotApplicable], Missing[NotApplicable],
  1.45 people , 1.72 people , 2.35 people , 2.35 people , 2.24 people ,
  1.88 people , 2.25 people , 2.46 people , 2.18 people , 2.48 people ,
  2.41 people , 2.46 people , 2.43 people , 2.32 people , 2.5 people ,
  1.86 people , Missing[NotApplicable], 2.73 people , 2.61 people , 2.38 people ,
  1.73 people , 2.87 people , 2.97 people , Missing[NotApplicable], 1.92 people }
```

In[136]:=

```
ListPlot[Transpose[{Table[
  Part[GeoEntities[Portland CITY, "ZIPCode"], x][
    "AverageHouseValue"],
  {x, 35}], Table[Part[GeoEntities[Portland CITY, "ZIPCode"], x][
    "PersonsPerHousehold"], {x, 35}]}]]]
```

Out[136]=

