

Eli — PS 10 — 2025-02-25

EIWL3 Sections 26, 27, and 28

Looks good. A couple of unfinished ones.
See comments. 9.5 / 10.

Chapter 26

In[310]:=

```
#^2 & /@ Range[20]
```

Out[310]=

```
{1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, 169, 196, 225, 256, 289, 324, 361, 400}
```

In[311]:=

```
Blend[{Red, #}, 1/2] & /@ {Yellow, Green, Blue}
```

Out[311]=

```
{, , 
```

In[312]:=

```
Column /@ Framed@{Alphabet[][[#]], Capitalize[Alphabet[][[#]]} & /@ Range[26]
```

Out[312]=

```
{

|   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|
| a | b | c | d | e | f | g | h | i | j | k | l |
| A | B | C | D | E | F | G | H | I | J | K | L |

,  


|   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| m | n | o | p | q | r | s | t | u | v | w | x | y | z |
| M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z |

}
```

In[313]:=

```
Framed[Style[Alphabet[][[#]], RandomColor[]], Background -> RandomColor[]] & /@ Range[26]
```

Out[313]=

```
{

|   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|
| a | b | c | d | e | f | g | h | i | j | k | l |
|---|---|---|---|---|---|---|---|---|---|---|---|

,  



|   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| m | n | o | p | q | r | s | t | u | v | w | x | y | z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

}
```

In[314]:=

```
Grid[{EntityList[Group of 5 COUNTRIES][[#],
EntityList[Group of 5 COUNTRIES][[#]]["Flag"]}& /@ Range[5], Frame -> All]
```

Out[314]=

France	
Germany	
Japan	
United Kingdom	
United States	

In[315]:=

```
WordCloud[WikipediaData[#]] & /@ {"apple", "pear", "peach"}
```

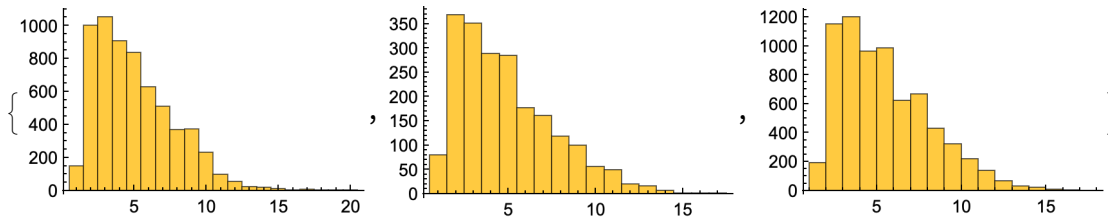
Out[315]=



In[316]:=

```
Histogram[StringLength[TextWords[WikipediaData[#]]] & /@ {"apple", "pear", "peach"}]
```

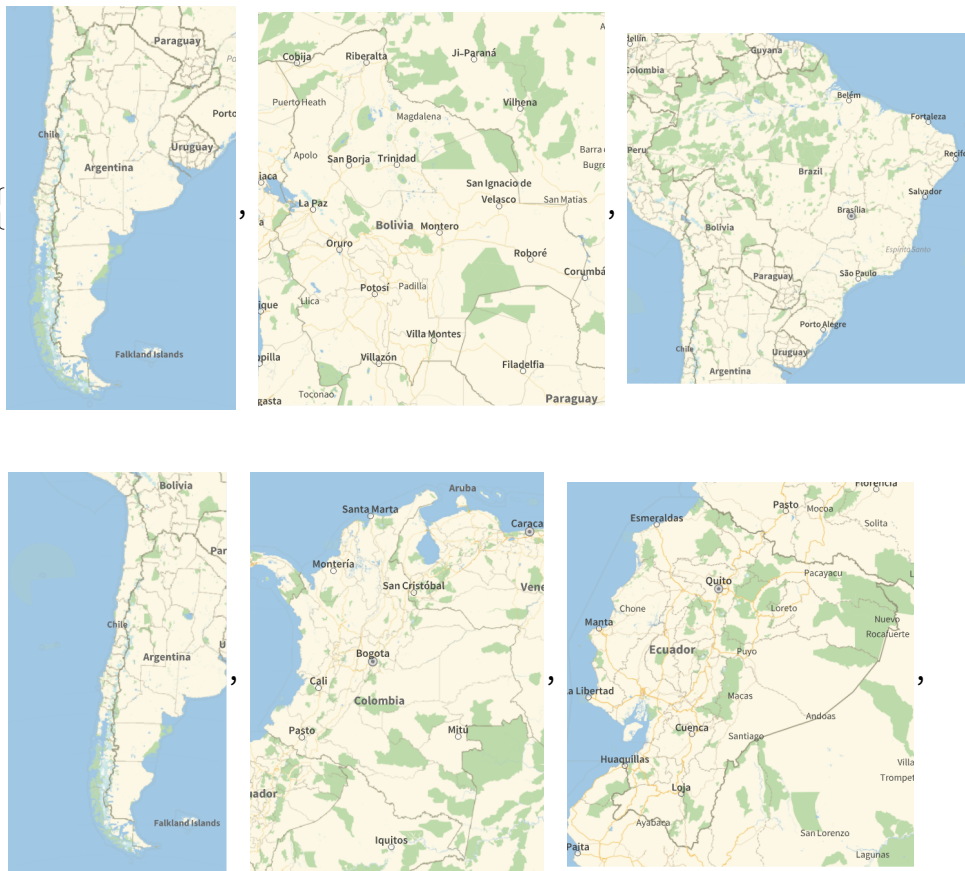
Out[316]=



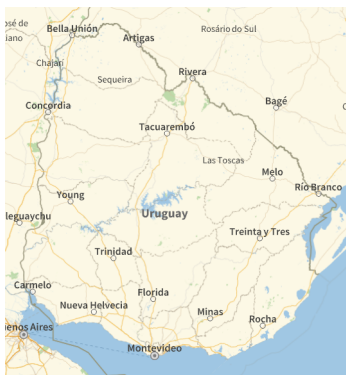
In[317]:=

```
GeoGraphics[EntityList[South America COUNTRIES][[#]] & /@  
Range[Length[EntityList[South America COUNTRIES]]]]
```

Out[317]=



It was supposed to be Central American countries. More importantly, the countries were supposed to be highlighted.



Chapter 27

In[318]:=

```
NestList[Blur[#] &, Rasterize[Style["x", 30]], 10]
```

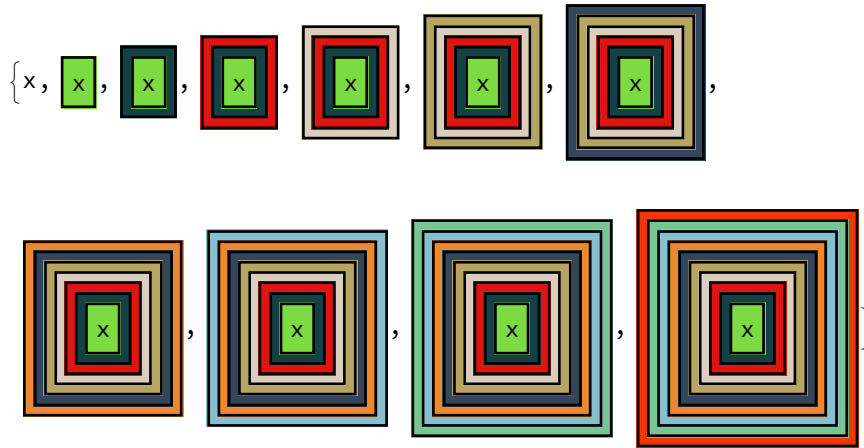
Out[318]=

```
{X, X, X, X, X, X, X, X, X, X, X}
```

In[319]:=

```
NestList[Framed[#, Background → RandomColor[]] &, x, 10]
```

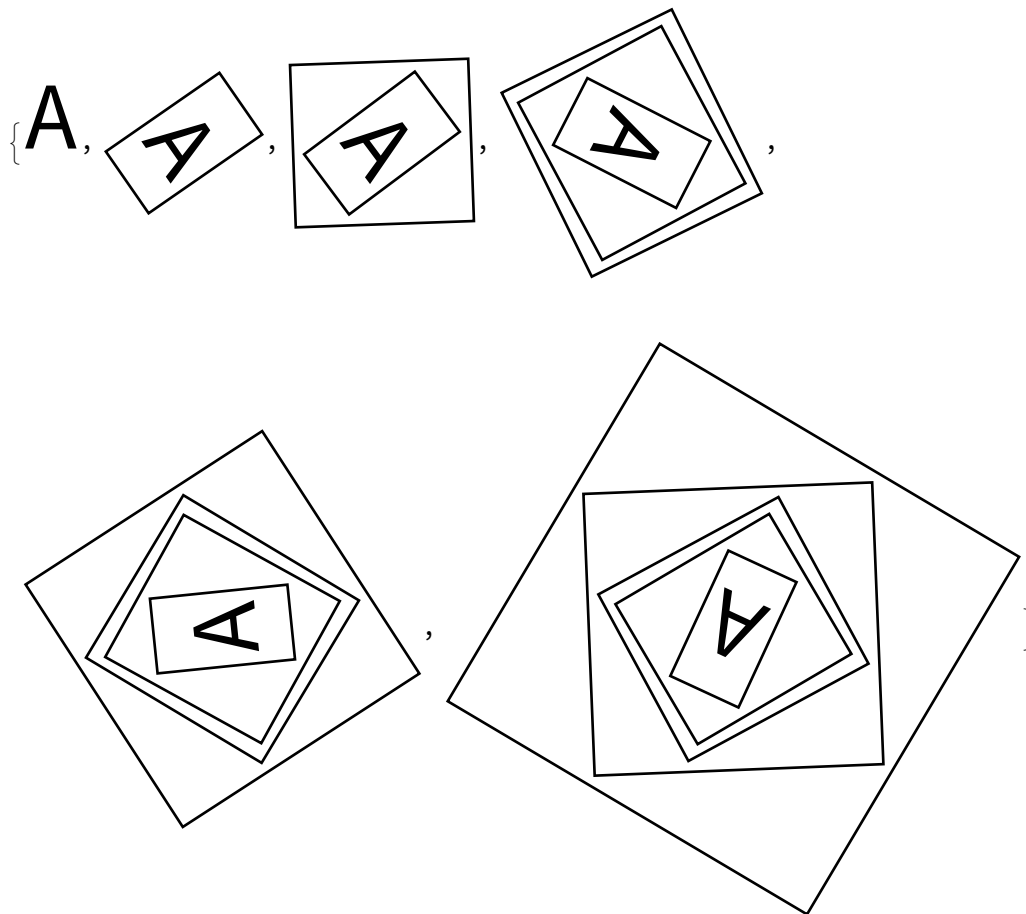
Out[319]=



In[320]:=

```
NestList[Rotate[Framed[#, RandomInteger[90]] &, Style["A", 50], 5]
```

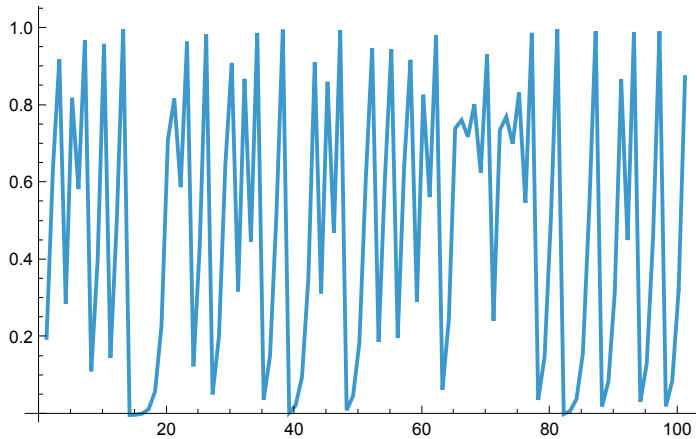
Out[320]=



In[321]:=

ListLinePlot[NestList[4 # (1 - #) &, 0.2, 100]]

Out[321]=



In[322]:=

N[NestList[1 + 1 / # &, 1, 30][[30]]]

Out[322]=

1.61803

In[323]:=

NestList[3 # &, 1, 10]

Out[323]=

{1, 3, 9, 27, 81, 243, 729, 2187, 6561, 19683, 59049}

In[324]:=

NestList[(# + 2 / #) / 2 &, 1.0, 5] - Sqrt[2]

Out[324]=

{-0.414214, 0.0857864, 0.0024531, 2.1239×10^{-6} , 1.59472×10^{-12} , -2.22045×10^{-16} }

In[325]:=

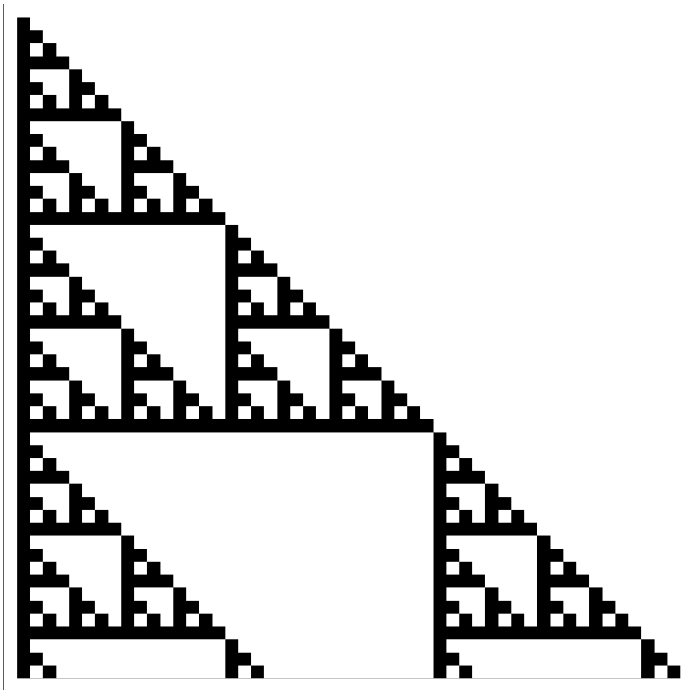
**NestList[{#[[1]] + RandomReal[-1, 1], #[[2]] + RandomReal[-1, 1]] &, {0, 0}, 1000]
(*no idea what's going on here*)****Syntax:** Expression cannot begin with "{#[[1]] + RandomReal[-1, 1], #[[2]] + RandomReal[-1, 1]] &".

In[325]:=

See my solution, wherein I added a random choice of +1, 0, or -1 to each of the x and y coordinate, repeatedly.

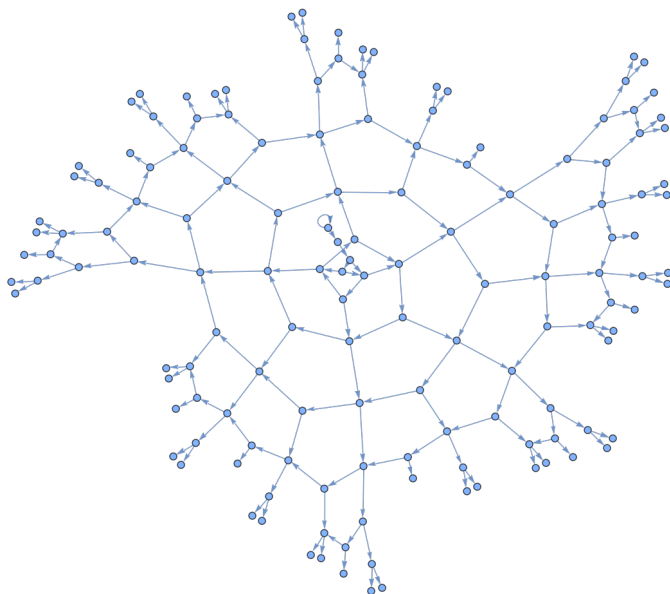
```
In[326]:=
ArrayPlot[NestList[Mod[Join[{0}, #] + Join[#, {0}], 2] &, {1}, 50]]
```

```
Out[326]=
```




```
In[327]:=
NestGraph[{# + 1, 2 #} &, 0, 10]
```

```
Out[327]=
```



When I executed your notebook, this operation timed out.
Not your problem. Just a network glitch.

In[328]:=

```
NestList[GeoNearest["Country", #] &, United States COUNTRY , 4]
```

 **GeoNearest:** A network operation for GeoNearest timed out. Please try again later.

 **GeoNearest:** \$Failed is not a valid location specification.

 **GeoNearest:** GeoNearest[Country, \$Failed] is not a valid location specification.

 **GeoNearest:** GeoNearest[Country, GeoNearest[Country, \$Failed]] is not a valid location specification.

 **General:** Further output of GeoNearest::invloc will be suppressed during this calculation. 

Out[328]=

```
{United States, $Failed, GeoNearest[Country, $Failed],
 GeoNearest[Country, GeoNearest[Country, $Failed]],
 GeoNearest[Country, GeoNearest[Country, GeoNearest[Country, $Failed]]]}
```

Chapter 28

In[329]:=

```
123^321 > 456^123
```

Out[329]=

```
True
```

In[330]:=

```
IntegerDigits /@ Range[100]
```

In 28.1 you were meant to select
those whose digits add up to < 5.

Out[330]=

```
{{1}, {2}, {3}, {4}, {5}, {6}, {7}, {8}, {9}, {1, 0}, {1, 1}, {1, 2}, {1, 3},
 {1, 4}, {1, 5}, {1, 6}, {1, 7}, {1, 8}, {1, 9}, {2, 0}, {2, 1}, {2, 2},
 {2, 3}, {2, 4}, {2, 5}, {2, 6}, {2, 7}, {2, 8}, {2, 9}, {3, 0}, {3, 1},
 {3, 2}, {3, 3}, {3, 4}, {3, 5}, {3, 6}, {3, 7}, {3, 8}, {3, 9}, {4, 0}, {4, 1},
 {4, 2}, {4, 3}, {4, 4}, {4, 5}, {4, 6}, {4, 7}, {4, 8}, {4, 9}, {5, 0}, {5, 1},
 {5, 2}, {5, 3}, {5, 4}, {5, 5}, {5, 6}, {5, 7}, {5, 8}, {5, 9}, {6, 0}, {6, 1},
 {6, 2}, {6, 3}, {6, 4}, {6, 5}, {6, 6}, {6, 7}, {6, 8}, {6, 9}, {7, 0}, {7, 1},
 {7, 2}, {7, 3}, {7, 4}, {7, 5}, {7, 6}, {7, 7}, {7, 8}, {7, 9}, {8, 0}, {8, 1},
 {8, 2}, {8, 3}, {8, 4}, {8, 5}, {8, 6}, {8, 7}, {8, 8}, {8, 9}, {9, 0}, {9, 1},
 {9, 2}, {9, 3}, {9, 4}, {9, 5}, {9, 6}, {9, 7}, {9, 8}, {9, 9}, {1, 0, 0}}
```

In[331]:=

```
If[PrimeQ[#] == True, Style[#, Red], #] & /@ Range[20]
```

Out[331]=

```
{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20}
```

In[332]:=

```
Select[WordList[], Last[Characters[#]] == "p" && First[Characters[#]] == "p" &]
```

Out[332]=

```
{pap, paperclip, parsnip, partisanship, partnership, pawnshop, peep, penmanship,
 pep, pickup, pileup, pip, plop, plump, polyp, pomp, pop, premiership,
 prep, primp, professorship, prop, proprietorship, pulp, pump, pup}
```



```

In[333]:=
Select[Prime[Range[100]], Last[IntegerDigits[#]] < 3 &]

Out[333]=
{2, 11, 31, 41, 61, 71, 101, 131, 151, 181, 191, 211,
 241, 251, 271, 281, 311, 331, 401, 421, 431, 461, 491, 521, 541}

In[334]:=
Select[RomanNumeral[Range[100]], MemberQ[Characters[#], "I"] == False &]

Out[334]=
{V, X, XV, XX, XXV, XXX, XXXV, XL, XLV,
 L, LV, LX, LXV, LXX, LXXV, LXXX, LXXXV, XC, XCV, C}

In[335]:=
Select[RomanNumeral[Range[1000]], Characters[#] == Reverse[Characters[#]] &]

Out[335]=
{I, II, III, V, X, XIX, XX, XXX, L, C, CXC, CC, CCC, D, M}

In[336]:=
Select[IntegerName[Range[100]], First[Characters[#]] == Last[Characters[#]] &]

Out[336]=
{nineteen, twenty-eight, thirty-eight, eighty-one,
 eighty-three, eighty-five, eighty-nine, ninety-seven}

In[337]:=
Select[TextWords[WikipediaData["Words"]], StringLength[#] > 15 &]

Out[337]=
{yibi-jarran-gabun, yibi-gabun-jarran, orthographically,
 multiple-morpheme, Proto-Indo-European, 978-0-08-044854-1}

In[338]:=
NestList[If[EvenQ[#] == True, #/2, 3 # + 1] &, 1000, 200]

Out[338]=
{1000, 500, 250, 125, 376, 188, 94, 47, 142, 71, 214, 107, 322, 161, 484, 242, 121, 364,
 182, 91, 274, 137, 412, 206, 103, 310, 155, 466, 233, 700, 350, 175, 526, 263,
 790, 395, 1186, 593, 1780, 890, 445, 1336, 668, 334, 167, 502, 251, 754, 377,
 1132, 566, 283, 850, 425, 1276, 638, 319, 958, 479, 1438, 719, 2158, 1079, 3238,
 1619, 4858, 2429, 7288, 3644, 1822, 911, 2734, 1367, 4102, 2051, 6154, 3077,
 9232, 4616, 2308, 1154, 577, 1732, 866, 433, 1300, 650, 325, 976, 488, 244, 122,
 61, 184, 92, 46, 23, 70, 35, 106, 53, 160, 80, 40, 20, 10, 5, 16, 8, 4, 2, 1, 4, 2,
 1, 4, 2, 1, 4, 2, 1, 4, 2, 1, 4, 2, 1, 4, 2, 1, 4, 2, 1, 4, 2, 1, 4, 2, 1, 4,
 2, 1, 4, 2, 1, 4, 2, 1, 4, 2, 1, 4, 2, 1, 4, 2, 1, 4, 2, 1, 4, 2, 1, 4, 2, 1,
 4, 2, 1, 4, 2, 1, 4, 2, 1, 4, 2, 1, 4, 2, 1, 4, 2, 1, 4, 2, 1, 4, 2, 1, 4, 2}

```

