Hexi—PS10—2025-02-25

Exercises from EIWL3 Section 26

Looks good. 10/10. Comments on pp. 6 and 9.

In[211]:=
```
#^2 & /@ Range[20]
```
Out[211]=
```
{1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, 169, 196, 225, 256, 289, 324, 361, 400}
```

In[212]:=
```
Blend[{#, Red}] & /@ {Yellow, Green, Blue}
```
Out[212]=

{■, ■, ■}

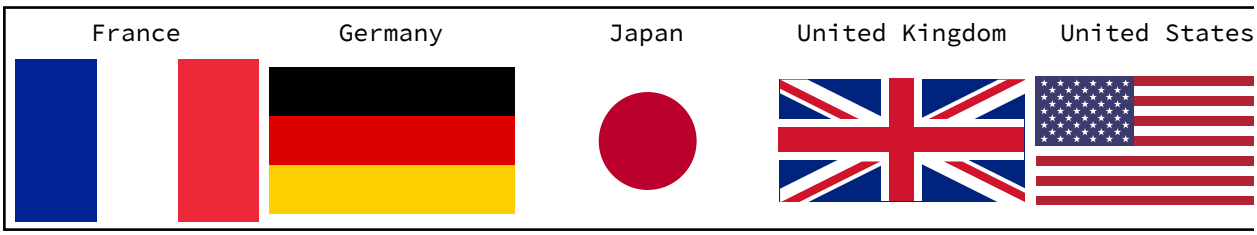
In[213]:=
```
Framed[Column[{ToUpperCase[#], ToLowerCase[#]}]] & /@ Alphabet[]
```
Out[213]=

{A a, B b, C c, D d, E e, F f, G g, H h, I i, J j, K k, L l,
M m, N n, O o, P p, Q q, R r, S s, T t, U u, V v, W w, X x, Y y, Z z}

In[214]:=
```
Framed[Style[#, RandomColor[]], Background → RandomColor[]] & /@ Alphabet[]
```
Out[214]=

{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[215]:=
```
Framed[Grid[{#["Name"], #["Flag"]}]] &@ Group of 5 COUNTRIES
```
Out[215]=



In[216]:=

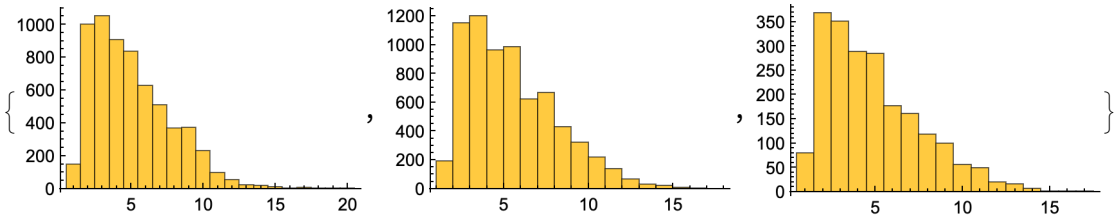
```
WordCloud[WikipediaData[#]] & /@ {"apple", "peach", "pear"}
```

Out[216]=

In[217]:=

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

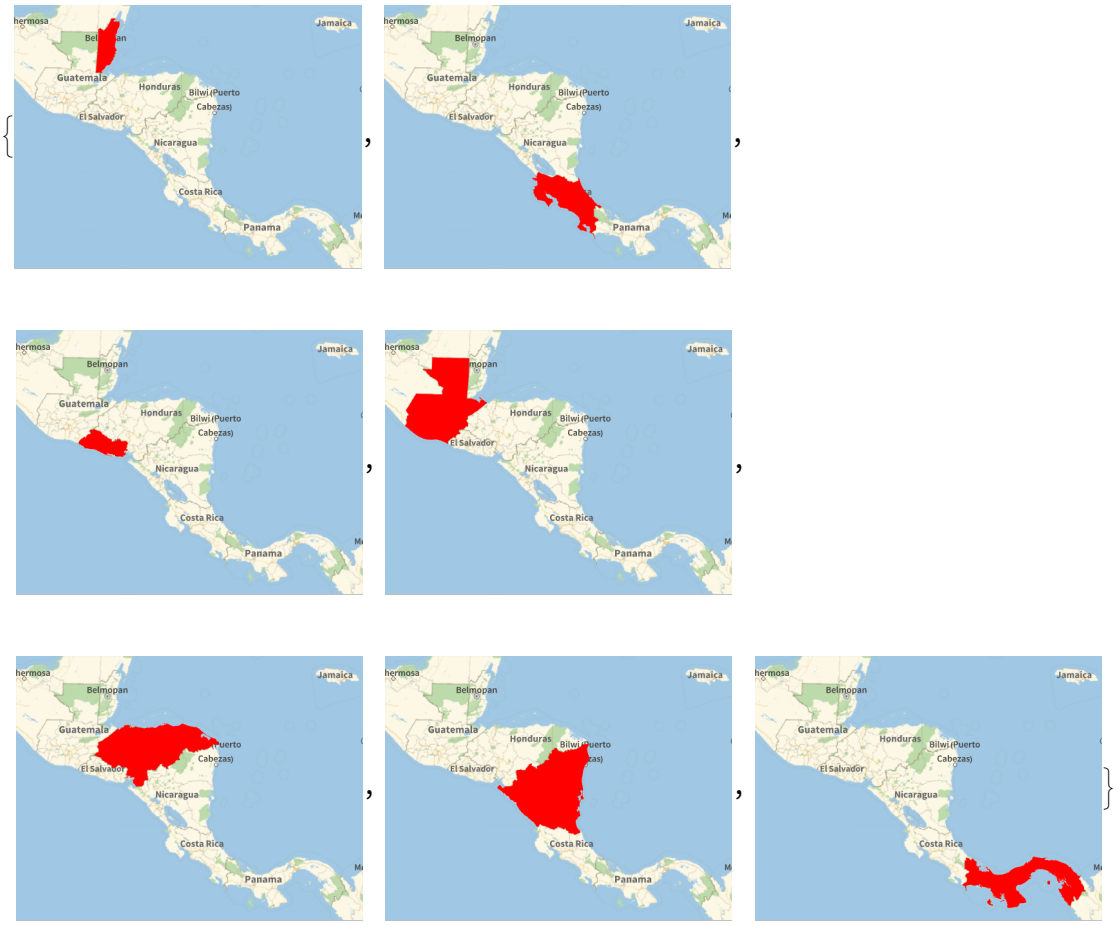
Out[217]=



In[218]:=

```
GeoGraphics[{GeoStyling[Red], Polygon[#]}, GeoRange → Central America COUNTRIES] & /@
 EntityList[Central America COUNTRIES]
```

Out[218]=



Exercises from EIWL3 Section 27

In[219]:=

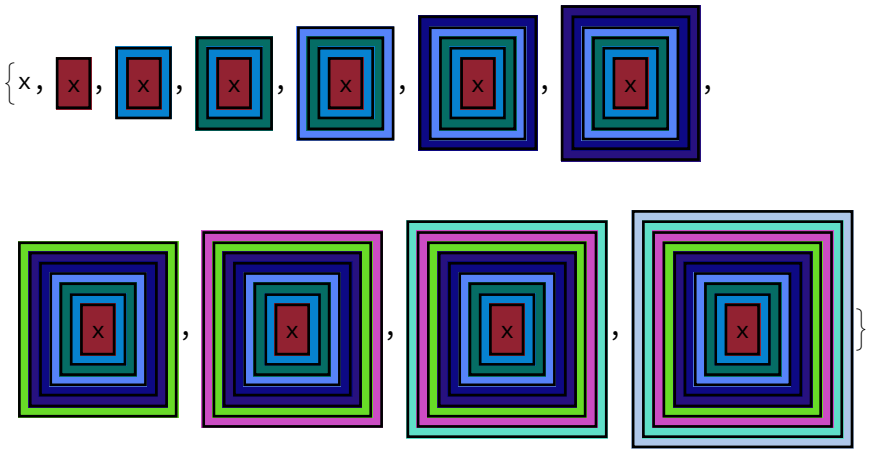
```
NestList[Blur[#] &, Rasterize[Style["X", 30]], 10]
```

Out[219]=

In[220]:=

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

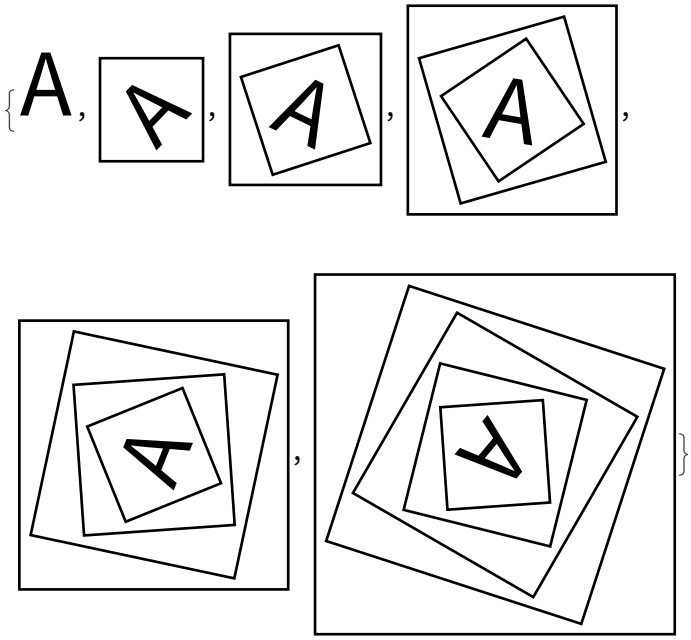
Out[220]=



In[221]:=

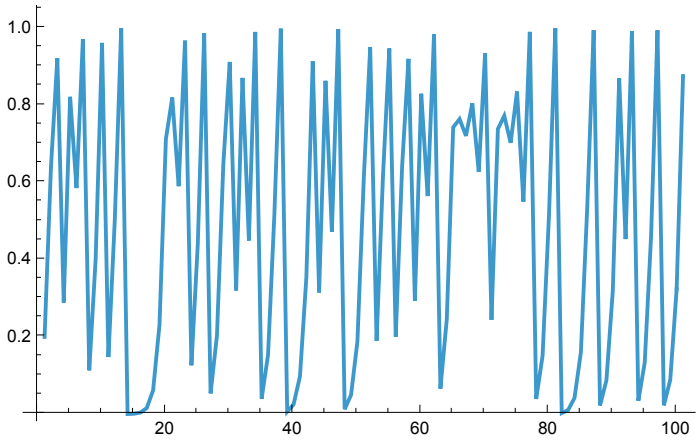
```
NestList[Framed[Rotate[#, RandomInteger[360] °]] &, Style["A", 50], 5]
```

Out[221]=



In[222]:=
```
ListLinePlot[NestList[4 # (1 - #) &, 0.2, 100]]
```

Out[222]=



In[223]:=
```
Nest[1 + 1 / # &, 1, 30] // N
```

Out[223]=
```
1.61803
```

In[224]:=
```
NestList[3 # &, 1, 10]
```

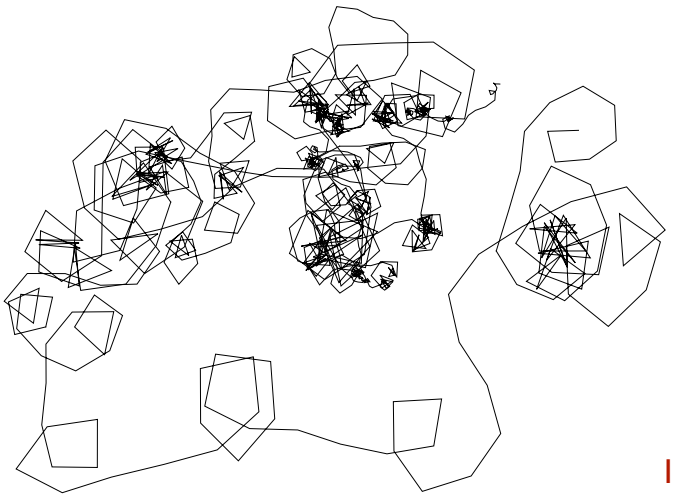
Out[224]=
```
{1, 3, 9, 27, 81, 243, 729, 2187, 6561, 19683, 59049}
```

In[225]:=
```
NestList[(# + 2 / #) / 2 &, 1.0, 5] - Sqrt[2]
```

Out[225]=
$$\{-0.414214,\ 0.0857864,\ 0.0024531,\ 2.1239\times10^{-6},\ 1.59472\times10^{-12},\ -2.22045\times10^{-16}\}$$

In[226]:=
```
Graphics[Line[AnglePath[
    NestList[# + {RandomReal[{-1, 1}], RandomReal[{-1, 1}]} &, {0, 0}, 1000]]]]
```

Out[226]=

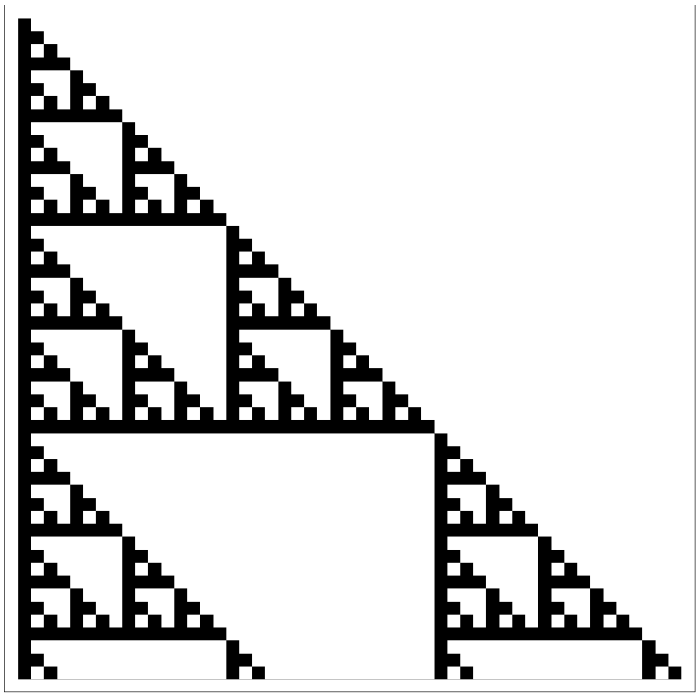


I don’t think he was looking for an AnglePath. See my solution.

In[227]:=

```
NestList[Mod[Join[{0}, #] + Join[#, {0}], 2] &, {1}, 50] // ArrayPlot
```

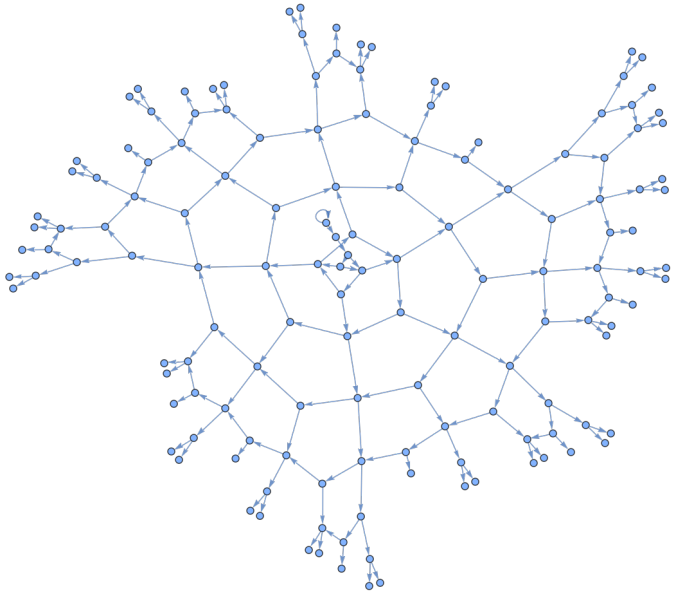
Out[227]=



In[228]:=

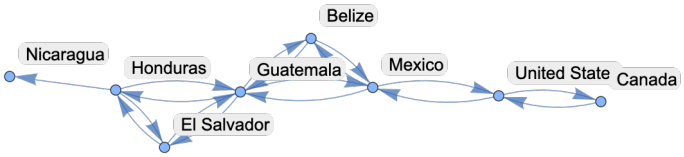
```
NestGraph[{2 #, # + 1} &, 0, 10]
```

Out[228]=



In[229]:=
```
NestGraph[#["BorderingCountries"] &, United States COUNTRY, 4, VertexLabels → Automatic]
```

Out[229]=



Exercises from EIWL3 Section 27

In[230]:=
```
123^321 > 456^123
```

Out[230]=
```
True
```

In[231]:=
```
Select[Range[100], Total[IntegerDigits[#]] < 5 &]
```

Out[231]=
```
{1, 2, 3, 4, 10, 11, 12, 13, 20, 21, 22, 30, 31, 40, 100}
```

In[232]:=
```
If[PrimeQ[#], Style[#, Red], #] & /@ Range[20]
```

Out[232]=
```
{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20}
```

In[233]:=
```
Select[WordList[], StringMatchQ[#, "p" ~~ __ ~~ "p"] &]
```

Out[233]=
```
{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[234]:=
```
Select[Prime[Range[100]], Last[IntegerDigits[#]] < 3 &]
```

Out[234]=
```
{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[235]:=
```
Select[RomanNumeral[Range[100]], ! StringContainsQ[#, "I"] &]
```

Out[235]=
```
{V, X, XV, XX, XXV, XXX, XXXV, XL, XLV,
 L, LV, LX, LXV, LXX, LXXV, LXXX, LXXXV, XC, XCV, C}
```

In[236]:=
```
Select[RomanNumeral /@ Range[1000], # == StringReverse[#] &]
```

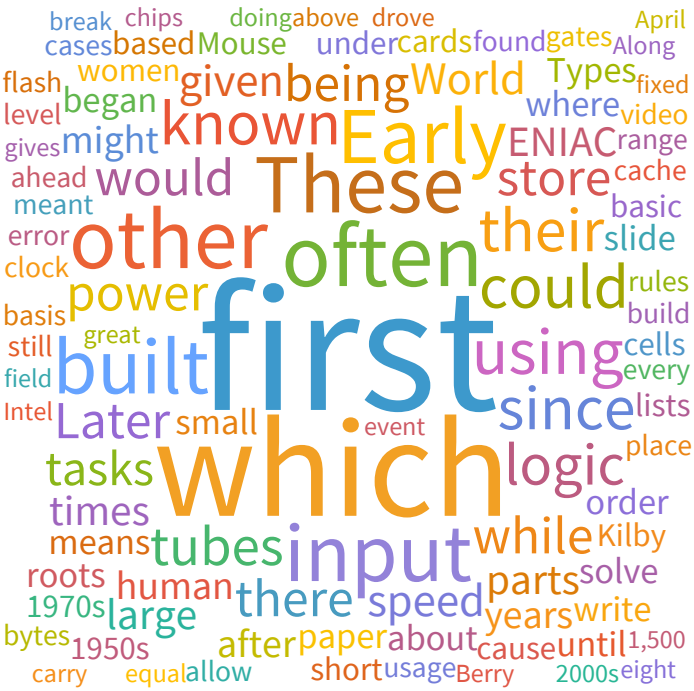
Out[236]=
```
{I, II, III, V, X, XIX, XX, XXX, L, C, CXC, CC, CCC, D, M}
```

In[237]:=
```
Select[IntegerName /@ Range[100], First@Characters[#] == Last@Characters[#] &]
```
Out[237]=
```
{nineteen, twenty-eight, thirty-eight, eighty-one,
 eighty-three, eighty-five, eighty-nine, ninety-seven}
```

In[238]:=
```
Select[TextWords[WikipediaData["words"]], StringLength[#] > 15 &]
```
Out[238]=
```
{yibi-jarran-gabun, yibi-gabun-jarran, orthographically,
 multiple-morpheme, Proto-Indo-European, 978-0-08-044854-1}
```

In[239]:=
```
NestList[If[EvenQ[#], # / 2, 3 # + 1] &, 1000, 200]
```
Out[239]=
```
{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, 1, 4, 2, 1, 4, 2, 1, 4, 2}
```

In[240]:=
```
WordCloud[Select[TextWords@WikipediaData["computer"], StringLength[#] == 5 &]]
```
Out[240]=



Should avoid the errors by first checking that the string length is at least 3.

In[241]:=
```
Select[WordList[],
 StringTake[#, 3] == StringReverse[StringTake[#, -3]] && # ≠ StringReverse[#] &]
```

StringTake: Cannot take positions 1 through 3 in "a".

StringTake: Cannot take positions −3 through −1 in "a".

StringReverse: String expected at position 1 in StringReverse[StringTake[a, −3]].

StringTake: Cannot take positions 1 through 3 in "ad".

General: Further output of StringTake::take will be suppressed during this calculation.

StringReverse: String expected at position 1 in StringReverse[StringTake[ad, −3]].

StringReverse: String expected at position 1 in StringReverse[StringTake[ah, −3]].

General: Further output of StringReverse::string will be suppressed during this calculation.

Out[241]=
```
{despised, detected, detested, drainboard,
 foolproof, lackadaisical, marjoram, revolver}
```

In[242]:=
```
Select[WordList[], StringLength[#] == 10 && Total@LetterNumber@Characters[#] == 100 &]
```

Out[242]=
```
{accumulate, alienation, answerable, apoplectic, aquamarine, bewitching, censurable,
 ceramicist, chastening, chimpanzee, clinically, collecting, condensate,
 congenital, conjugated, connivance, declension, deliquesce, demobilize,
 demodulate, denominate, diagonally, discipline, discommode, egoistical,
 emasculate, embodiment, emendation, empathetic, fatalistic, fatherhood,
 geographer, hemoglobin, inadequacy, interbreed, leveraging, liberalism,
 likelihood, martingale, mercantile, meridional, neoclassic, paramecium,
 plebiscite, potbellied, quadrangle, reciprocal, regimented, reschedule,
 researcher, scoreboard, septicemia, shibboleth, sleepyhead, stagecraft,
 stalemated, temperance, thickening, threatened, uncombined, unmodified}
```