Harper — PS 10 — 2025-02-25

EIWL Sections 26-28

Looks very good. 10 / 10.

Section 26

A few comments (some in response to your comments) below.

Out[248]=

In[249]:=

In[247]:= Grid [{#, EntityValue[#, "Flag"]} & /@ EntityList [Group of 5 COUNTRIES ...], Frame → All

Out[247]= France Germany Japan **United Kingdom United States**

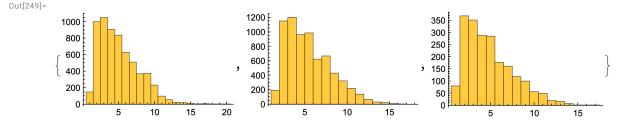
In[248]:= WordCloud[WikipediaData[#]] & /@ {"apple", "peach", "pear"}

color England high cidername aphid nuts diseases goddess cooking time leaves 2017 United varieties University used Aphrodite form fresh group genomeny thology cultivated North include treesproduction domestica rawdisease rootstocks fruit Malus states used to make the cooking and the co ISBN Asia cultivar C cfound growing calledproduced Century cultivation ize GreekCollection popular introduced browning small cooked flowering commonly controlled breeding Pests juicewild brown different grown eating ethylearly grow

Englishrelated worldapple borer total blossomperiod growinggeneticflower color America production published leaves BCE burger full to the production published leaves BCE burger full to the production published leaves growing production production published leaves growing production pr skinsouthPrunusfruit cultivarsused3
mothsignificant moth significant domestication cm sourceswi
United European grown modern called
State eastern centralchillingstone
fleshwhite years cherry place

Book Latin According Calleryanal eaves edible flowers from Subsp. Chin aussuriensis variety applescider food produce Chin aussuriensis variety applescider food produce Chin aussuriensis variety applescider food produce Cultivate do no shape perryinstruments Communis Asia ripen Varieties 3/YTUS Europeangenus produced produced Subspiritus Produced 3,000 amainly tree 20 Cal Subspiritus Allert and Subspiritus Alle Europe ipe North +1 Western ripe North PerNorth 1 x Cultivarstall 2 cultivation SPECIES com green native sinkiangensis fruit pfurnitureBureau summer de foundpyrifoliabretschneideriknown world regions-ripeningrootstocksagricultureCooking Like History whitewordaccountsBradfordtableAward

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



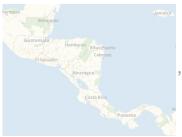


Out[250]=



I think you need to use GeoListPlot to make the countries highlight.











In[251]:=

Range[10]^2+1

Out[251]=

{2, 5, 10, 17, 26, 37, 50, 65, 82, 101}

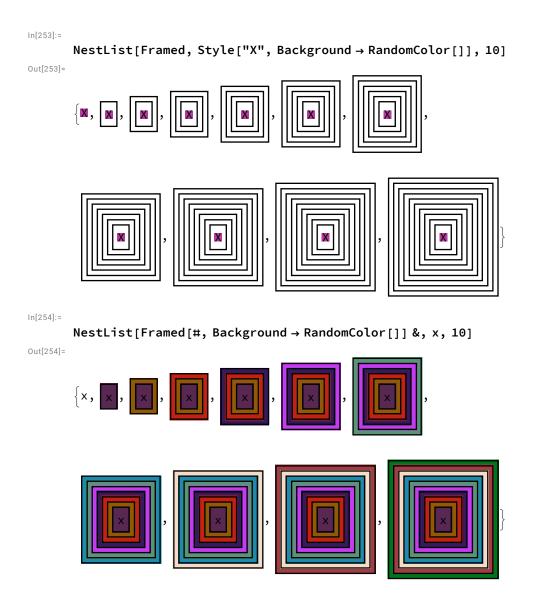
Section 27

In[252]:=

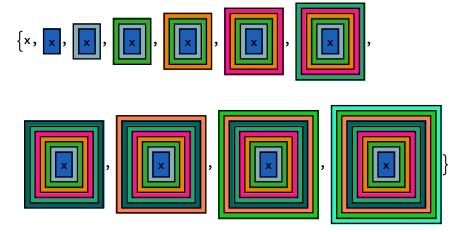
NestList[Blur, Rasterize[Style["X", 30]], 10]

Out[252]=



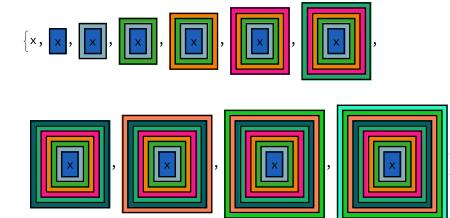


In[255]:=



(*I don't understand how the above function avoids the problem of the previous*)

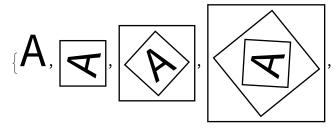


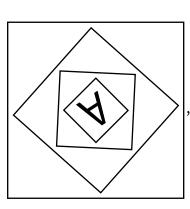


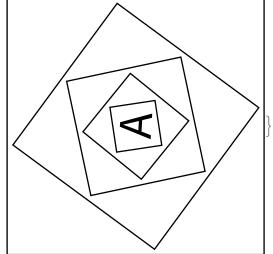
Is the difference that in one case, NestList is repeatedly applying Framed whereas in the other case, it is applying Framed with a new background color? That seems pretty understandable, but maybe I don't understand your question.

NestList[Framed[Rotate[#, RandomReal[{0, 360 °}]]] &, Style["A", 50], 5]

Out[256]=

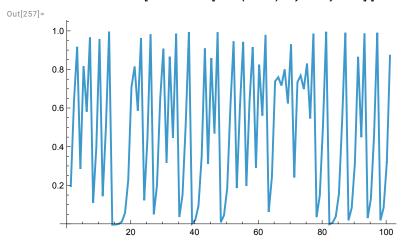






In[257]:=

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



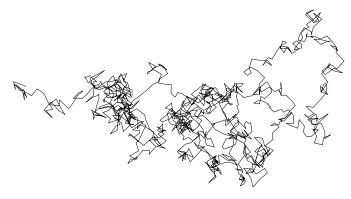
In[258]:=

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

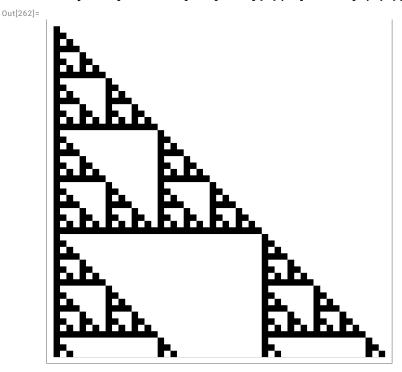
Out[258]=

1.61803

```
In[259]:=
        NestList[3 * # &, 1, 10]
Out[259]=
         {1, 3, 9, 27, 81, 243, 729, 2187, 6561, 19683, 59049}
In[260]:=
        NestList[(#+2/#)/2&, 1.0, 5] - Sqrt[2]
Out[260]=
         \left\{-\text{0.414214, 0.0857864, 0.0024531, 2.1239} \times \text{10}^{-6}, \text{1.59472} \times \text{10}^{-12}, \text{-2.22045} \times \text{10}^{-16}\right\}
In[261]:=
        Graphics[Line[NestList[#+RandomReal[{-1, 1}, 2] &, {0, 0}, 1000]]]
Out[261]=
```

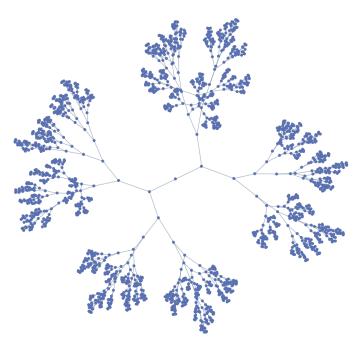


In[262]:= ArrayPlot[NestList[Mod[Join[{0}, #] + Join[#, {0}], 2] &, {1}, 50]]



In[263]:= NestGraph[$\{# \rightarrow # + 1, # \rightarrow 2 #\} \&, 0, 10$]

Out[263]=



In[264]:= NestGraph[#["BorderingCountries"] &, Entity["Country", "USA"], 4, VertexLabels → All]

Out[264]=



Section 28

In[265]:= 123 ^ 321 > 456 ^ 123

Out[265]=

True

In[266]:= Select[Range[100], Total[IntegerDigits[#]] < 5 &]</pre>

Out[266]= $\{1, 2, 3, 4, 10, 11, 12, 13, 20, 21, 22, 30, 31, 40, 100\}$

In[267]:= If[PrimeQ[#], Style[#, Red], #] & /@ Range[20]

Out[267]= $\{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20\}$

```
In[268]:=
      Select[WordList[], StringTake[#, 1] == StringTake[StringReverse[#], 1] == "p" &]
Out[268]=
      {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[269]:=
      Out[269]=
      241, 251, 271, 281, 311, 331, 401, 421, 431, 461, 491, 521, 541}
In[270]:=
      Select[RomanNumeral[Range[100]], ! MemberQ[Characters[#], "I"] &]
Out[270]=
      {V, X, XV, XX, XXV, XXX, XXXV, XL, XLV,
       L, LV, LX, LXV, LXX, LXXV, LXXXV, XC, XCV, C}
In[271]:=
      Select[RomanNumeral[Range[1000]], StringReverse[#] == # &]
Out[271]=
      {I, II, III, V, X, XIX, XX, XXX, L, C, CXC, CC, CCC, D, M}
In[272]:=
      Select[IntegerName[Range[100]], StringTake[#, 1] == StringTake[StringReverse[#], 1] &]
Out[272]=
      {nineteen, twenty-eight, thirty-eight, eighty-one,
       eighty-three, eighty-five, eighty-nine, ninety-seven}
In[273]:=
      Out[273]=
      {yibi-jarran-gabun, yibi-gabun-jarran, orthographically,
       multiple-morpheme, Proto-Indo-European, 978-0-08-044854-1}
In[274]:=
      NestList[If[EvenQ[#], #/2, 3 # + 1] &, 1000, 200]
Out[274]=
      {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[275]:=
       WordCloud[Select[TextWords[WikipediaData["Computers"]], StringLength[#] == 5 &]]
Out[275]=
           break. chips
                          doingabove drove
                                 undercards found gates Along
           casesbasedMouse
       still
       field
                         afterpaperabout<sub>cause</sub>until<sup>1,500</sup>
                 equalallow
                                 shortusageBerry
                                                     2000seight
In[276]:=
       Select[WordList[],
        StringTake(#, 3) == StringTake(StringReverse(#), 3) &&# # StringReverse(#) &)
       ••• StringTake: Cannot take positions 1 through 3 in "a".
       ••• StringTake: Cannot take positions 1 through 3 in "a".
       ••• StringTake: Cannot take positions 1 through 3 in "ad".
       💬 General: Further output of StringTake::take will be suppressed during this calculation. 🕖
Out[276]=
       {despised, detected, detested, drainboard,
         foolproof, lackadaisical, marjoram, revolver}
```

Need a conditional test that the string has at least length 3 to avoid the errors.

In[277]:=

Select[WordList[], StringLength[#] == 10 && Total[LetterNumber[#]] == 100 &]

Out[277]=

```
{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}
```