Brian — PS 10 — 2025-02-25 — Solution

EIWL3 Sections 26, 27, and 28

Exercises from EIWL3 Section 26

In[82]:= (* 26.5 *) {EntityValue[#, "Name"], EntityValue[#, "Flag"]} & /@ EntityList Group of 5 COUNTRIES // Grid[#, Frame → All] &

Out[82]=



In[83]:= (* 26.6 *) WordCloud[WikipediaData[#]] & /@ {"apple", "peach", "pear"} Out[83]=

color England high cidernameaphid nuts America generally, diseasesgoddess cookingtime Foodseed Sincluding Honeycrisp Davidson leaveSpoit modern United varieties University used Aphrodite form include trees production domestical rawdisease rootstocks fruit Malus States use Chinastorage Cultivars domesticated Minew Eastfree Malus States use Coldens Malus Species Species Malus Species Species Species develop Golden ISBN cultivar Cfound fruits called produced century cultival size Greek Collection Popular introduced browning small cooked flowering commonly controlled breeding Pests juice wild brown different grown eating ethylearly grow calledproduced

Englishrelated world apple borer total blossom period, growing genetic flower blossom period, growing genetic flower blossom period, growing genetic flower blossom period, including different growth states usually naturalized found america grow early American production published leaves gearly American production published leaves gearly American production published leaves gearly American production published leaves growing the period growing and the period growing growing and the period growing g similar yellow Japan persicanectarines skinsouthPrunus ruit cultivarsuSeds mothsignificant domestication cm sourceswi commondingstoneGeorgiacultivated addition
United European grown modern called
State eastern grown modern called
fleshwhiteyears centralchillingstone
fleshwhiteyears cherry place

Book Latin According Calleyana leaves dible flowers form subsp. Chinaussuriensis variety apples cider food produce Chinaussuriensis variety apples cider food produce Chinaussuriensis variety apples cider food produced communis Asia ripen Varieties 3/Y I U Seuropeangenus produced wild rree 20 Car Sused 3,000 mainly tree 3,000 mai +1Western 1 × Cultivarstall 2 cultivarion Species cm green manufacture Asian native sinkiangensis fruitsproduction fruitsproduction fruitsproduction summer de foundpyrifoliabretschneideriknown world regions ripening roots tock sagriculture Cooking Like History whiteword accounts Bradford table Award

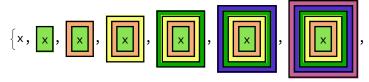
In[84]:= (* 26.7 *)Histogram[StringLength[TextWords[WikipediaData[#]]]] & /@ {"apple", "peach", "pear"} Out[84]= 1200 -**,** 150 In[85]:= (* 26.8 *)GeoListPlot[#, GeoRange → ## Central America COUNTRIES] & /@ EntityList Central America COUNTRIES Out[85]=

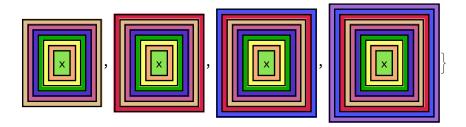
Exercises from EIWL3 Section 27

In[86]:= (* 27.1 *) NestList[Blur, Rasterize[Style["X", 30]], 10]
Out[86]=

$$\{X, X, X, X, X, X, X, X, X, X\}$$

In[87]:= (* 27.2 *) NestList[Framed[#, Background \rightarrow RandomColor[]] &, x, 10] Out[87]=





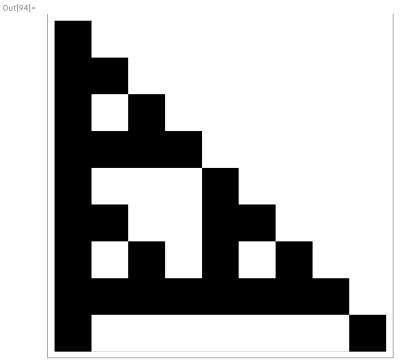
```
In[88]:= (* 27.3 *) NestList[
        Rotate[Framed[#], RandomReal[] 360 °] &,
       Style["A", 50],
       5
      ]
       (★ This was another one that I used indentation to help me ★)
      (* see the organization of the functions and their arguments. \star)
Out[88]=
In[89]:= (* 27.4 *) ListLinePlot[NestList[4#(1-#)&, 0.2, 100]]
Out[89]=
      1.0
      0.4
                           40
                                    60
 In[90]:= (* 27.5 *) Nest[1+1/#&, 1, 30] // N
```

Out[90]=

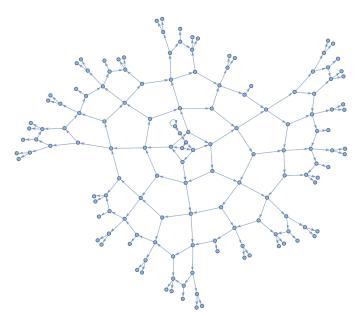
1.61803

```
In[91]:= (* 27.6 *) NestList[3#&, 1, 10] (* This gives 11 results, of course. *)
Out[91]=
       {1, 3, 9, 27, 81, 243, 729, 2187, 6561, 19683, 59049}
In[92]:= (* 27.7 *) NestList[(#+2/#)/2&, 1.0, 5] - Sqrt[2]
Out[92]=
       \{-0.414214, 0.0857864, 0.0024531, 2.1239 \times 10^{-6}, 1.59472 \times 10^{-12}, -2.22045 \times 10^{-16}\}
In[93]:= (* 27.8 *) (* Hmmm. He asked for a
        Graphics. Is it ok that I used a ListLinePlot? *)
       (* I used AspectRatio→1 and PlotRange→{{-50,50},{-50,50}} so that the result *)
       (* wouldn't be scrunched along whichever axis happened the walk went further. *)
      ListLinePlot[NestList[#+{RandomChoice[{+1, 0, -1}], RandomChoice[{+1, 0, -1}]} &,
         \{0, 0\}, 1000\}, AspectRatio \rightarrow 1, PlotRange \rightarrow \{\{-50, 50\}, \{-50, 50\}\}\}
Out[93]=
                               40
           -40
                                           20
```

In[94]:= (* 27.9 *) NestList[Mod[Join[{0}, #] + Join[#, {0}], 2] &, {1}, 8] // ArrayPlot



In[95]:= (* 27.10 *) NestGraph[{#+1, 2#} &, 0, 10] Out[95]=



```
(* 27.11 *) NestGraph | #["BorderingCountries"] &,
                                   4, VertexLabels → All
          United States COUNTRY ✓
Out[96]=
                                     Belize
          Nicaragua
                                          Mexico
                    Honduras
                                                     United State Canada
                        El Salvador
```

Exercises from EIWL3 Section 28

```
ln[97]:= (* 28.1 *) 123^{321} > 456^{123}
Out[97]=
      True
In[98]:= Total[IntegerDigits[#]] < 5 & /@ 3</pre>
Out[98]=
       3
In[99]:= Select[IntegerDigits[#] == {1, 2}, Range[100]]
Out[99]=
      True
In[100]:=
       (* 28.2 *) Select[
        Range[100],
        Total[IntegerDigits[#]] < 5 &
Out[100]=
       \{1, 2, 3, 4, 10, 11, 12, 13, 20, 21, 22, 30, 31, 40, 100\}
In[101]:=
       (* 28.3 *) If[PrimeQ[#], Style[#, Red], #] & /@ Range[20]
Out[101]=
       \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20\}
In[102]:=
       (* 28.4 *) Select[
        WordList[], First[Characters[#]] == "p" && Last[Characters[#]] == "p" &
       1
Out[102]=
       {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[103]:=
       (* 28.5 *) Select[Prime[Range[100]], Last[IntegerDigits[#]] == 3 &]
Out[103]=
       {3, 13, 23, 43, 53, 73, 83, 103, 113, 163, 173, 193, 223,
       233, 263, 283, 293, 313, 353, 373, 383, 433, 443, 463, 503, 523}
In[104]:=
       (* 28.6 *) Select[RomanNumeral[Range[100]], ! StringContainsQ[#, "I"] &]
Out[104]=
       {V, X, XV, XX, XXV, XXX, XXXV, XL, XLV,
       L, LV, LX, LXV, LXX, LXXV, LXXX, LXXXV, XC, XCV, C}
In[105]:=
       (* 28.7 *) Select[RomanNumeral[Range[1000]], # == StringReverse[#] &]
Out[105]=
       {I, II, III, V, X, XIX, XX, XXX, L, C, CXC, CC, CCC, D, M}
In[106]:=
       (* 28.8 *) Select[IntegerName[Range[100]],
       First[Characters[#]] == Last[Characters[#]] &]
Out[106]=
       {nineteen, twenty-eight, thirty-eight, eighty-one,
        eighty-three, eighty-five, eighty-nine, ninety-seven}
In[107]:=
       (* 28.9 *) Select[TextWords[WikipediaData["words"]], StringLength[#] > 15 &]
Out[107]=
       {yibi-jarran-gabun, yibi-gabun-jarran, orthographically,
       multiple-morpheme, Proto-Indo-European, 978-0-08-044854-1}
In[108]:=
       (* 28.10 *) NestList[If[EvenQ[#], #/2, 3#+1] &, 1000, 200]
Out[108]=
       {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, 1, 4, 2}
```

```
In[109]:=
```

(* 28.11 *)

WordCloud[Select[TextWords[WikipediaData["computers"]], StringLength[#] == 5 &]]

Out[109]=

```
break. chips
                  doingabove drove
                         undercards found gates Along
   casesbased Mouse
                         paperabout cause until
bytes<sub>1950s</sub>
  carry
          equalallow
                         shortusageBerry
```

In[110]:=

(* 28.12 *) Select[WordList[], StringLength[#] ≥ 3 && Take[Characters[#], 3] == Take[Characters[StringReverse[#]], 3] && # # StringReverse[#] &]

Out[110]=

{despised, detected, detested, drainboard, foolproof, lackadaisical, marjoram, revolver}

In[111]:=

(* 28.13 *) Select[WordList[], Total[LetterNumber[Characters[#]]] == 100 &]

Out[111]=

{acclimation, accumulate, acknowledge, acquitted, adulthood, affectation, alienation, amiableness, analysis, annually, answerable, anterior, apoplectic, appertain, appointed, apropos, aquamarine, archdiocesan, asbestos, attitude, autoclave, automated, avocation, awfully, beetroot, benediction, bettering, bewitching, bipartite, birthmark, blissful, botanist, bouillon, boulevard, boundary, boycott, breviary, bronchus, browser, burnished, cacophony, candidature, cardiograph, carouser, carpenter, carroty, censurable, ceramicist, chastening, chimpanzee, chromium, clinically, clockwise, clotting, coatroom, collecting, cometary, companion, comport, concavely, condensate, confabulate, congenital, congress, conjoint, conjugated, conjunct, connivance, contented, cookout, corridor, costumed, couchette, coverlet, coyness, creosote, crudity, culture, curettage, cutout, cysteine, debarkation, declarative, declension, decorous, deliquesce, delivery, demobilize, demodulate, denominate, depletion, dewberry, diagonally,

digestive, dinginess, disarranged, discernible, discipline, discommode, discredited, disjoint, dispraise, distrait, divinely, dooryard, doubleheader, drizzle, dumbfound, duologue, ebullient, egoistical, elsewhere, emasculate, embodiment, emendation, empathetic, encrust, epitaxy, espouse, eulogize, eventual, excellent, excoriate, falseness, fatalistic, fatherhood, ferryman, finitely, fluorine, flurry, forefoot, forewarn, forgiver, forsaking, fountain, frisson, gauntlet, geographer, gladiolus, glissando, glutamate, godparent, grandaunt, grappling, grouper, grumpy, harmonics, healthily, hemoglobin, hirsute, hobbyist, hollering, holograph, honeycomb, honoring, hospital, hotness, imbroglio, immature, impaction, imported, impotence, inadequacy, inapplicable, inefficient, inflation, ingrown, innately, innovate, inoculate, insecticide, intellect, interbreed, interfere, irritate, jailhouse, judiciary, kibitzer, knothole, landholding, landscaping, largeness, leveraging, liberalism, liberator, lightning, likelihood, limpidly, litotes, lubricant, macrocosm, magnetize, martinet, martingale, matchless, matchmaking, maximize, meatpacking, mercantile, mercurial, merganser, meridional, merrily, midpoint, mirrored, misdirect, missus, molecular, morphemic, moussaka, mummify, nastily, neoclassic, nestling, neuronal, nihilist, ninepins, nonhuman, nostalgic, notional, numeracy, nutty, obscenely, offhandedly, operetta, ornament, outflank, outlier, outlined, outrank, outset, overboard, palpitate, paramecium, pasture, pathless, personage, personal, perturb, phagocyte, phlebitis, pianistic, pilaster, pistachio, plastered, plebiscite, plummet, plummy, postdate, posting, postpaid, potbellied, pounding, pouring, prevent, primary, printer, producer, profuse, progeny, publicly, pumpkin, pursue, putter, pyridine, quadrangle, quarry, quarter, quicklime, radiocarbon, raillery, ravisher, receptor, reciprocal, redeploy, refinery, reflation, regimented, regroup, reimpose, renovate, repress, reprint, reprobate, reputable, reschedule, researcher, reshuffle, resolved, restore, retiring, reversal, riverbank, roadster, roomful, roommate, ruction, sagebrush, saintlike, saintly, salacious, savory, scoreboard, scrapbook, scrummage, sculpted, scuttle, selective, self-defense, semaphore, semitone, septicemia, services, session, shadowing, shakedown, shakeout, shattered, shibboleth, shipyard, shooter, shortcake, shrieking, sightly, simulate, sleepyhead, smitten, snobbery, socialism, soughing, sparkler, spirited, splashy, spyhole, squint, stagecraft, stalemated, starfish, starling, status, strangled, stress, striker, subsume, sucrose, surcharge, surely, sweetened, sweptback, swimmer, swollen, syndicate, tailspin, telephone, telescope, temperance, temporal, tensely, tetanus, thalidomide, therefore, thickening, thievish, thirty, thorny, threatened, thumbnail, tinkerer, towards, traction, trademarked, transect, transom, trembling, triplet, tropics, truism, tularemia, tuppence, turkey, turnoff, twisted, unaltered, unavailable, unbounded, unbridgeable, unbroken, uncombined, underdone, underlay, undress, unequaled, unfasten, unfreeze, unhorse, unkempt, unlighted, unmanly, unmatchable, unmodified, unrelated, unwearied, urbanized, urticaria, useless, utensil, variety, varnished, venation, verbalize, vinous, vouchsafe, waterbird, Wednesday, whenever, whirling, whiskey, wholesale, whooper, writing, yarrow}