Brian — PS 10 — 2025-02-25 — Solution

EIWL3 Sections 26, 27, and 28

Exercises from EIWL3 Section 26

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

Out[•]=



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

Pestsdifferentgoddess diseases Aphrodite Seeds ethylogold modern produced cultivated modern produced cultivated United genome group production Malus University cooking organic rootstocks fruit mythology grafting M. storage Cultivars domesticate new cooking organic rootstocks fruit mythology grafting M. storage Cultivars domesticaknown new Golden A. 2011 free States and Cooking of the Cooking organic rootstocks fruit mythology grafting methods of the Cooking of the Co Golden Old sieversiipopular_{Honey}crispspecies^{wild} North browningincludingcultivationbreeding^{small} juicegrowing Allergy Greeknameeatingfruitsearly

cultureancientknowngrowing apple English growthAmericaEuropeanbreeding used wild color Georgiaperiodpublished different southborer yearsearly fruits Prunus tree additionflesh states pecies Fruits authorized additionflesh states pecies fruits authorized usually croppersical pecies fruits color white similar to be a color of the state of the states pecies fruits and the states pecies fruits pecies fru yellow Chinanectarinesproduction red called Chinese trees cultivars United red central significant temperatures centruy flower genetic lingstonedomestication including moth BCEStates grown cultivated American almond related sources common blossom leaves Eastgrown ameeastern winterplace

Book Latin According Calleryanaleavesed ible flowers form Subsp. Chinaussuriensis variety applescider food Produce Chinaussuriensis variety applescider food Produce Chinaussuriensis variety applescider food Produce Chinaussuriensis variety applescider food Produced Communis Asia ripen Varieties 3/ VIUS Europeangenus produced VIUS Europeangenus Produced VIUS Europeangenus Produced VIUS Europeangenus VIIIS Europeangenus VIIIS

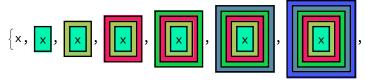
(* 26.7 *) Histogram[StringLength[TextWords[WikipediaData[#]]]] & /@ {"apple", "peach", "pear"} Out[•]= 1200 -300 **,** 150 In[∘]:= (* 26.8 *)GeoListPlot [#, GeoRange → | Central America COUNTRIES] & /@ EntityList ☐ ☐ Central America COUNTRIES Out[•]=

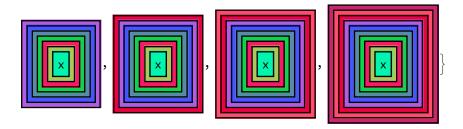
Exercises from EIWL3 Section 27

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

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

 $ln[*]:= (* 27.2 *) NestList[Framed[#, Background <math>\rightarrow$ RandomColor[]] &, x, 10] Out[•]=





```
In[@]:= (* 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[ • ]=
```

In[*]:* (* 27.4 *) ListLinePlot[NestList[4 # (1 - #) &, 0.2, 100]]
Out[*]:*

In[*]:* (* 27.5 *) Nest[1+1/# &, 1, 30] // N
Out[*]:*

1.61803

In[*]:* (* 27.6 *) NestList[3 # &, 1, 10] (* This gives 11 results, of course. *)
Out[*]:*

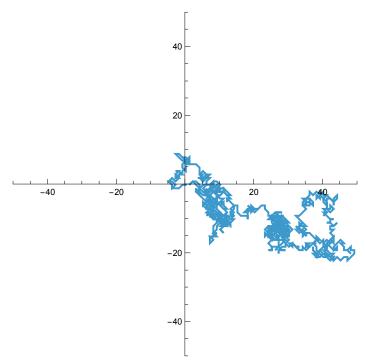
(1, 3, 9, 27, 81, 243, 729, 2187, 6561, 19683, 59049)

In[*]:* (* 27.7 *) NestList[(#+2/#)/2 &, 1.0, 5] - Sqrt[2]
Out[*]:*

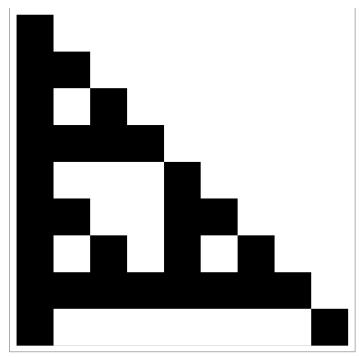
{-0.414214, 0.0857864, 0.0024531, 2.1239 × 10⁻⁶, 1.59472 × 10⁻¹², -2.22045 × 10⁻¹⁶}

```
(* 27.8 *) (* Hmmm. He asked for a
 Graphics. Is it ok that I used a ListLinePlot? *)
(* I used AspectRatio\rightarrow1 and PlotRange\rightarrow{{-50,50},{-50,50}} so that the result *)
(* wouldn't be scrunched along whichever axis happened the walk went further. \star)
ListLinePlot[NestList[\#+\{RandomChoice[\{+1,\ 0,\ -1\}],\ RandomChoice[\{+1,\ 0,\ -1\}]\}\ \&,
  \{0, 0\}, 1000\}, AspectRatio \rightarrow 1, PlotRange \rightarrow \{\{-50, 50\}, \{-50, 50\}\}\}
```

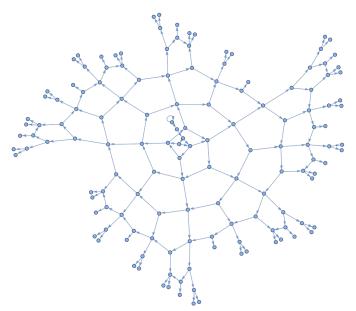
Out[•]=



 $ln[\circ]:=$ (* 27.9 *) NestList[Mod[Join[{0}, #] + Join[#, {0}], 2] &, {1}, 8] // ArrayPlot Out[•]=



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



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

Exercises from EIWL3 Section 28

```
In[\bullet]:= (* 28.1 *) 123^{321} > 456^{123}
Out[ • ]=
       True
 In[*]:= Total[IntegerDigits[#]] < 5 & /@ 3</pre>
 In[@]:= Select[IntegerDigits[#] == {1, 2}, Range[100]]
Out[ • ]=
       True
 In[*]:= (* 28.2 *) Select[
        Range [100],
        Total[IntegerDigits[#]] < 5 &
Out[ • ]=
       \{1, 2, 3, 4, 10, 11, 12, 13, 20, 21, 22, 30, 31, 40, 100\}
       (* 28.3 *) If[PrimeQ[#], Style[#, Red], #] & /@ Range[20]
Out[ • ]=
       \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20\}
 In[*]:= (* 28.4 *) Select[
        WordList[], First[Characters[#]] == "p" && Last[Characters[#]] == "p" &
       1
Out[ • ]=
       {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[*]:= (* 28.5 *) Select[Prime[Range[100]], Last[IntegerDigits[#]] == 3 &]
Out[ • ]=
       {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[*]:= (* 28.6 *) Select[RomanNumeral[Range[100]], ! StringContainsQ[#, "I"] &]
Out[ • ]=
       {V, X, XV, XX, XXV, XXX, XXXV, XL, XLV,
        L, LV, LX, LXV, LXX, LXXV, LXXX, LXXXV, XC, XCV, C
 In[*]:= (* 28.7 *) Select[RomanNumeral[Range[1000]], # == StringReverse[#] &]
Out[ • ]=
       {I, II, III, V, X, XIX, XX, XXX, L, C, CXC, CC, CCC, D, M}
       (* 28.8 *) Select[IntegerName[Range[100]],
       First[Characters[#]] == Last[Characters[#]] &]
Out[ • ]=
       {nineteen, twenty-eight, thirty-eight, eighty-one,
        eighty-three, eighty-five, eighty-nine, ninety-seven}
 In[*]:= (* 28.9 *) Select[TextWords[WikipediaData["words"]], StringLength[#] > 15 &]
Out[ • ]=
       {yibi-jarran-gabun, yibi-gabun-jarran, orthographically,
        multiple-morpheme, Proto-Indo-European, 978-0-08-044854-1}
 In[*]:= (* 28.10 *) NestList[If[EvenQ[#], #/2, 3#+1] &, 1000, 200]
Out[ • ]=
       {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[ \circ ] := ( \star 28.11 \star )
      WordCloud[Select[TextWords[WikipediaData["computers"]], StringLength[#] == 5 &]]
```

Out[•]=

doingabove drove break chips undercards found gates Along casesbased Mouse began _i givesmight ahead M/O meant still field event bytes_{1.950s} afterpaperabout cause until 1,500 shortusageBerry equalallow 2000seight carry

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

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

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

Out[•]=

{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}