Brian — PS 10 — 2025-02-25 — Solution

EIWL3 Sections 26, 27, and 28

Exercises from *EIWL3* Section 26

```
In[•]:= (* 26.1 *) Power[#, 2] & /@ Range[20]
```

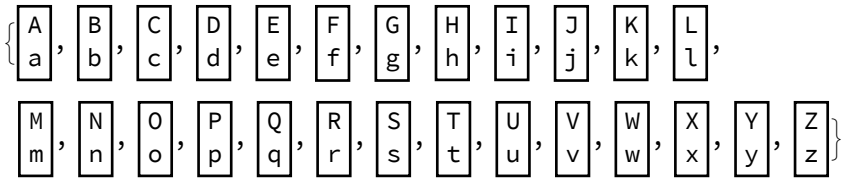
```
Out[•]= {1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, 169, 196, 225, 256, 289, 324, 361, 400}
```

```
In[•]:= (* 26.2 *) Blend[{Red, #}] & /@ {Yellow, Green, Blue}
```

```
Out[•]= {■, ■, ■}
```

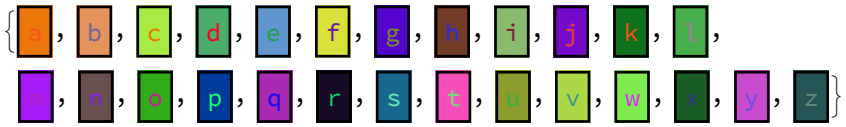
```
In[•]:= (* 26.3 *) Framed[Column[{ToUpperCase[#], #}]] & /@ Alphabet[]
```

```
Out[•]=
```



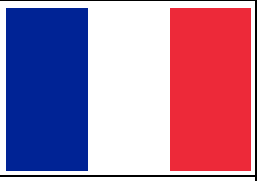
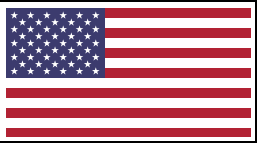
```
In[•]:= (* 26.4 *)Framed[Style[#, RandomColor[]], Background → RandomColor[]] & /@ Alphabet[]
```

```
Out[•]=
```



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

Out[•]=

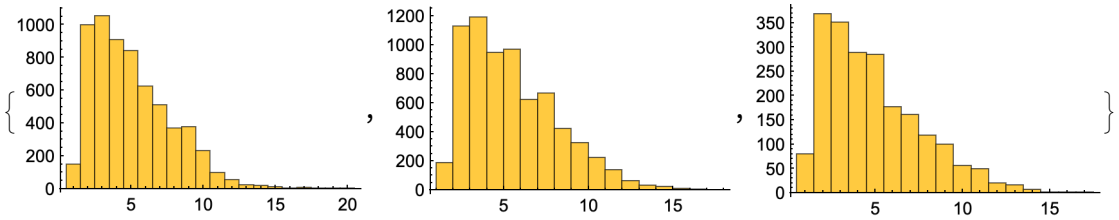
France	
Germany	
Japan	
United Kingdom	
United States	

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

Out[•]=

```
(* 26.7 *)
Histogram[StringLength[TextWords[WikipediaData[#]]]] & /@ {"apple", "peach", "pear"}
```

Out[ ]=



In[ ]:=

```
(* 26.8 *)GeoListPlot[#, GeoRange → Central America COUNTRIES] & /@
EntityList[Central America COUNTRIES]
```

Out[ ]=

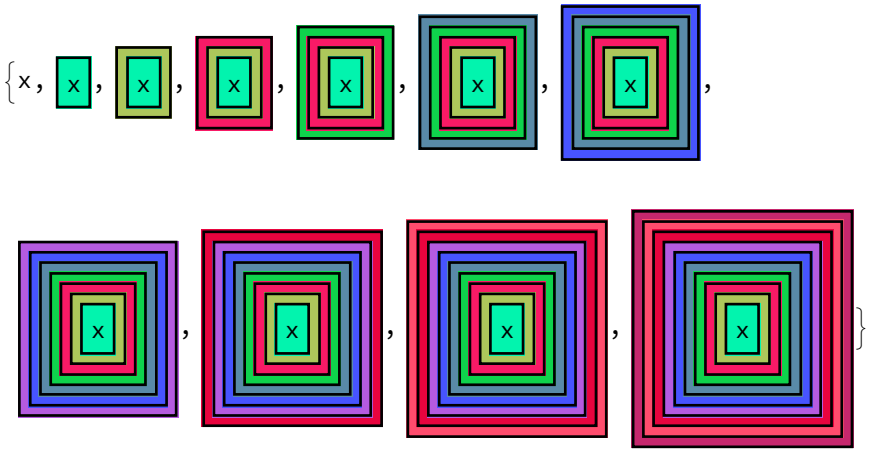
Exercises from *EIWL3* Section 27

In[330]:=
```
(* 27.1 *) NestList[Blur, Rasterize[Style["X", 30]], 10]
```

Out[330]=

In[333]:=
```
(* 27.2 *) NestList[Framed[#, Background → RandomColor[]] &, x, 10]
```

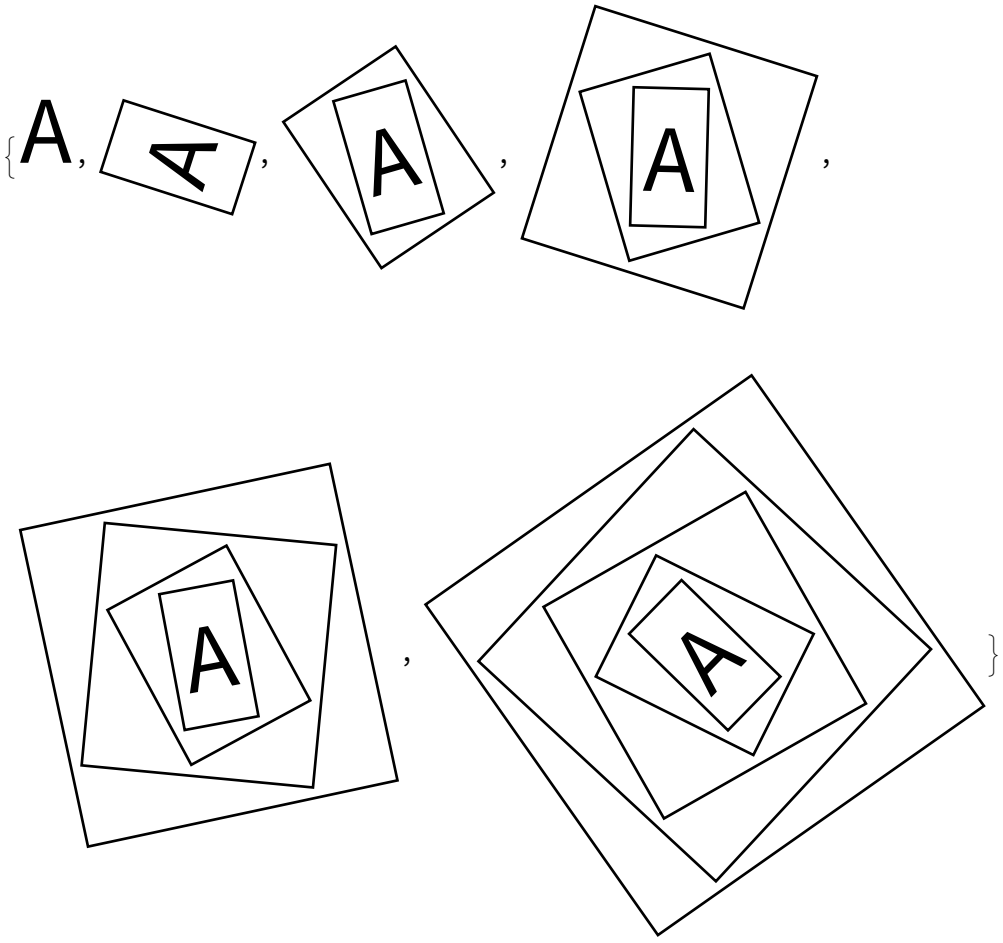
Out[333]=



In[339]:=

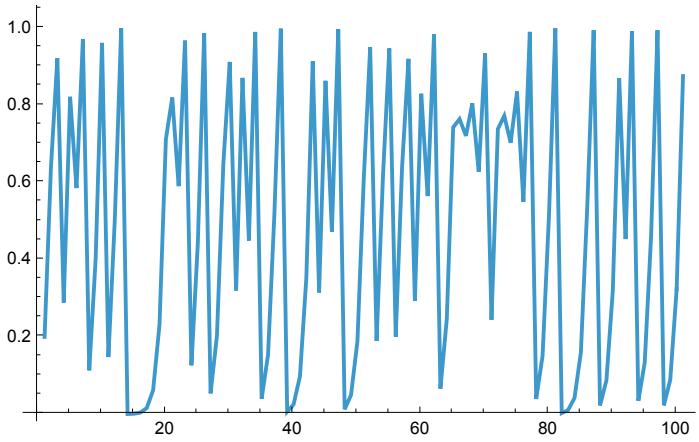
```
(* 27.3 *) NestList[
 Rotate[Framed[#], RandomReal[] 360 °] &,
 Style["A", 50],
 5
]
(* This was another one that I used indentation to help me *)
(* see the organization of the functions and their arguments. *)
```

Out[339]=



In[341]:=
```
(* 27.4 *) ListLinePlot[NestList[ 4 # (1 - #) &, 0.2, 100]]
```

Out[341]=



In[343]:=
```
(* 27.5 *) Nest[1 + 1 / # &, 1, 30] // N
```

Out[343]=
```
1.61803
```

In[345]:=
```
(* 27.6 *) NestList[3 # &, 1, 10] (* This gives 11 results, of course. *)
```

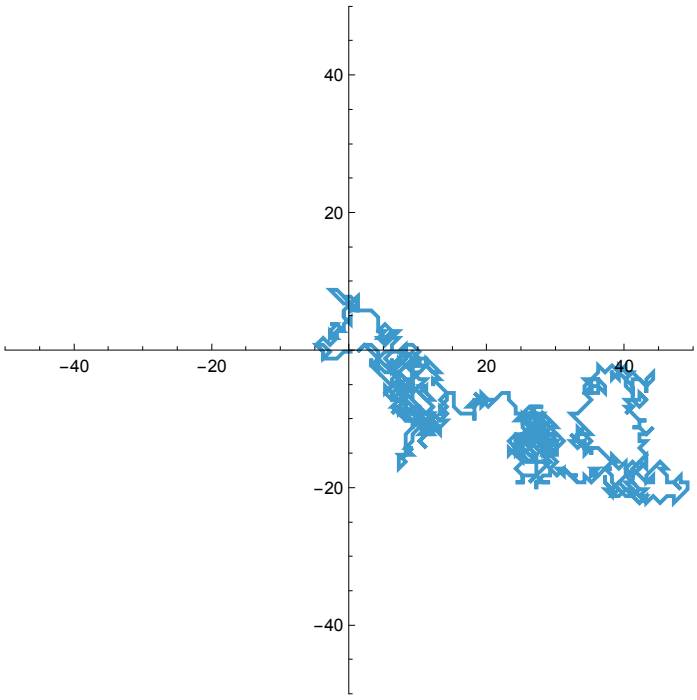
Out[345]=
```
{1, 3, 9, 27, 81, 243, 729, 2187, 6561, 19 683, 59 049}
```

In[347]:=
```
(* 27.7 *) NestList[(# + 2 / #) / 2 &, 1.0, 5] - Sqrt[2]
```

Out[347]=
$$\{-0.414214,\ 0.0857864,\ 0.0024531,\ 2.1239\times10^{-6},\ 1.59472\times10^{-12},\ -2.22045\times10^{-16}\}$$

```
(* 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 → 1, PlotRange → {{-50, 50}, {-50, 50}}]
```

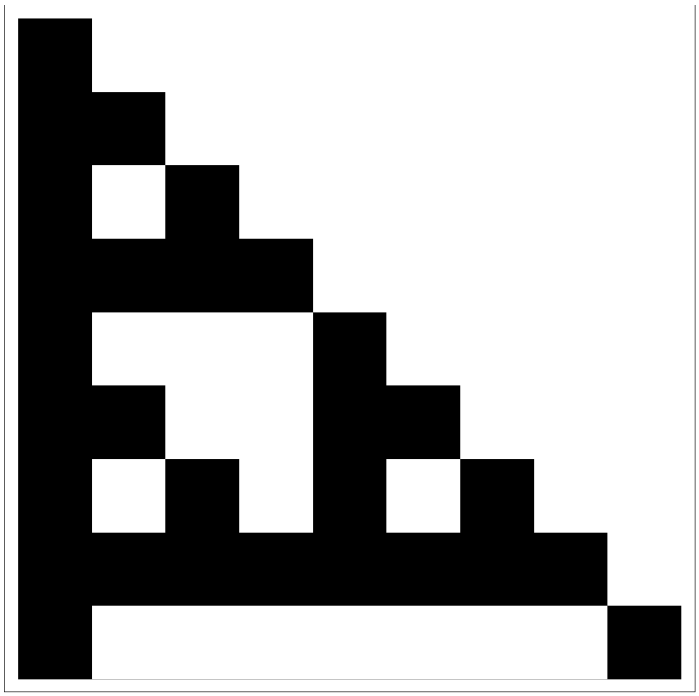
Out[363]=



In[365]:=

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

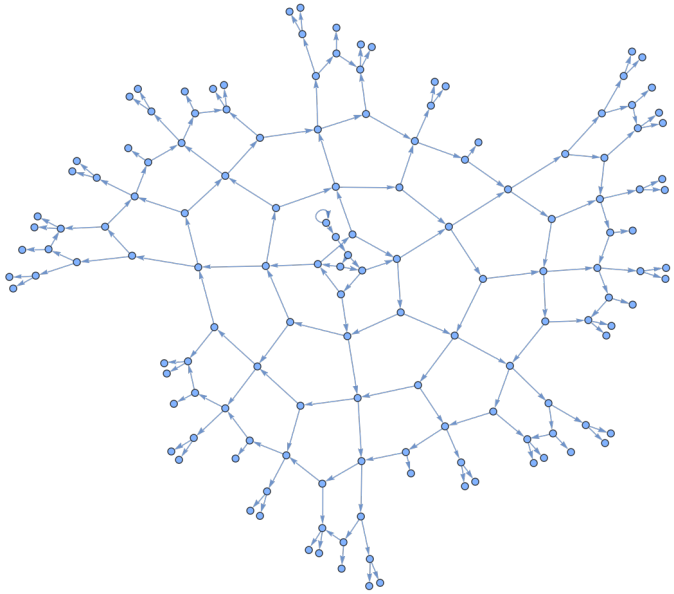
Out[365]=



In[366]:=

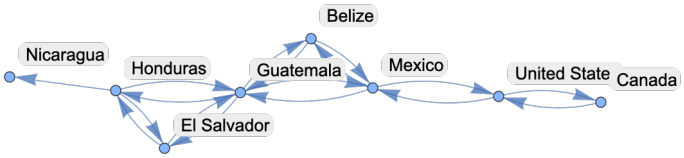
```
(* 27.10 *) NestGraph[{# + 1, 2 #} &, 0, 10]
```

Out[366]=



In[369]:=
```
(* 27.11 *) NestGraph[#["BorderingCountries"] &,
 United States COUNTRY ✓, 4, VertexLabels → All]
```

Out[369]=



Exercises from *EIWL3* Section 28

In[370]:=
```
(* 28.1 *) 123^321 > 456^123
```

Out[370]=
```
True
```

In[378]:=
```
Total[IntegerDigits[#]] < 5 & /@ 3
```

In[379]:=
```
Select[IntegerDigits[#] == {1, 2}, Range[100]]
```

Out[379]=
```
True
```

In[380]:=
```
(* 28.2 *) Select[
 Range[100],
 Total[IntegerDigits[#]] < 5 &
]
```

Out[380]=
```
{1, 2, 3, 4, 10, 11, 12, 13, 20, 21, 22, 30, 31, 40, 100}
```

```
(* 28.3 *) If[PrimeQ[#], Style[#, Red], #] & /@ Range[20]
```

Out[385]=
```
{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20}
```

```
(* 28.4 *) Select[
  WordList[]],

]
(* 28.5 *)
(* 28.6 *)
(* 28.7 *)
(* 28.8 *)
(* 28.9 *)
```

```
(* 28.10 *)

(* 28.11 *)

(* 28.12 *)

(* 28.13 *)
```