

Brian — PS 15 — 2025-04-01 — Solution

EIWL3 Sections 37 and 38

Exercises from *EIWL3* Section 37

In[674]:=

```
(* 37.1 *) Array[Framed[#, Background -> If[EvenQ[#], Yellow, LightGray]] &, 100]
```

Out[674]=

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24	25	26	27	28	29	30		
31	32	33	34	35	36	37	38	39	40	41	42	43	44		
45	46	47	48	49	50	51	52	53	54	55	56	57	58		
59	60	61	62	63	64	65	66	67	68	69	70	71	72		
73	74	75	76	77	78	79	80	81	82	83	84	85	86		
87	88	89	90	91	92	93	94	95	96	97	98	99	100		

In[678]:=

```
(* 37.2 *) Array[If[PrimeQ[#], Framed[#, #] &, 100]
```

Out[678]=

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42		
43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61			
62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80			
81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100		

In[680]:=

(* 37.3 *)

Array[If[PrimeQ[#], Labeled[Framed[#, Background → LightGray], Mod[#, 4]], #] &, 100]

Out[680]=

```

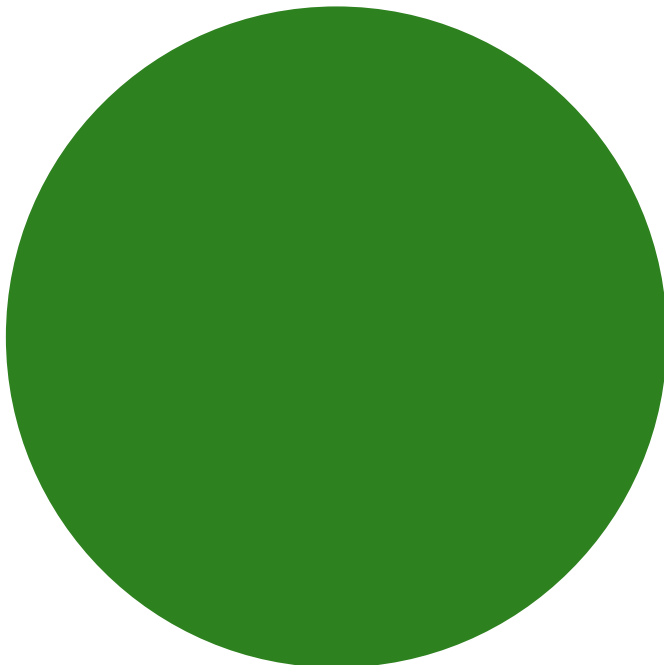
{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17,
  2, 3, 1, 3, 3, 1, 1,
  18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33,
  3, 3, 1, 3,
  34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50,
  1, 1, 3, 3,
  51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67,
  1, 3, 1, 3,
  68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83,
  3, 1, 3, 3,
  84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100}
  1 1

```

In[686]:=

Graphics[{RandomColor[], Disk[]}]

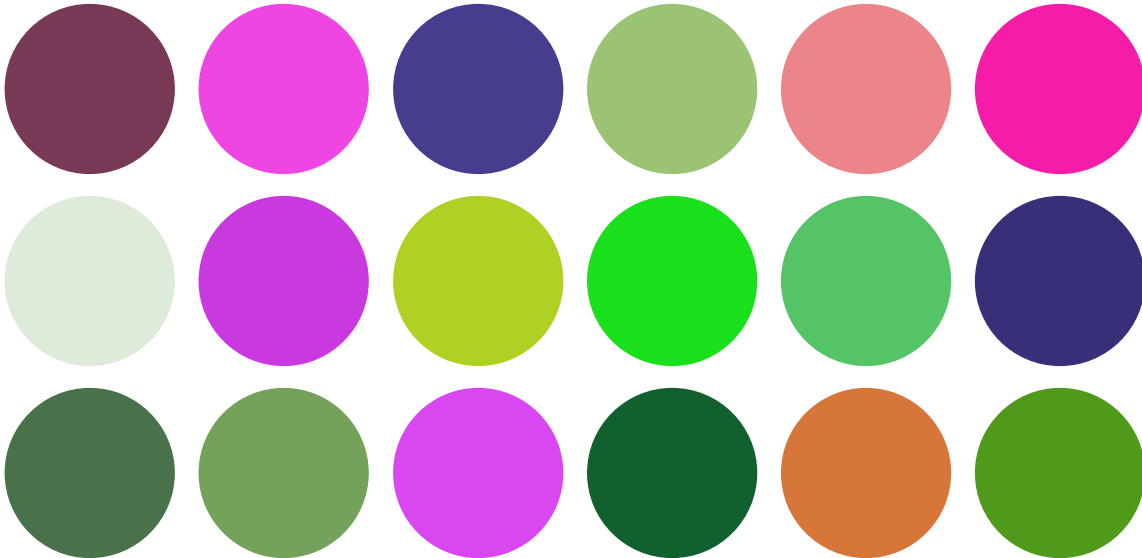
Out[686]=



In[687]:=

```
(* 37.4 *) GraphicsGrid[Table[Graphics[{RandomColor[], Disk[]}], 3, 6]]
```

Out[687]=



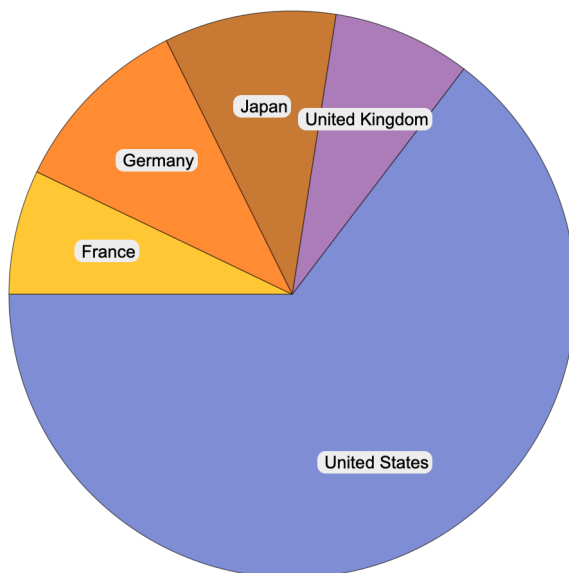
In[688]:=

Group of 5 COUNTRIES

In[701]:=

```
(* 37.5 *) countries = EntityList[];  
PieChart[Labeled[#, "GDP"], #] & /@ countries]
```

Out[702]=

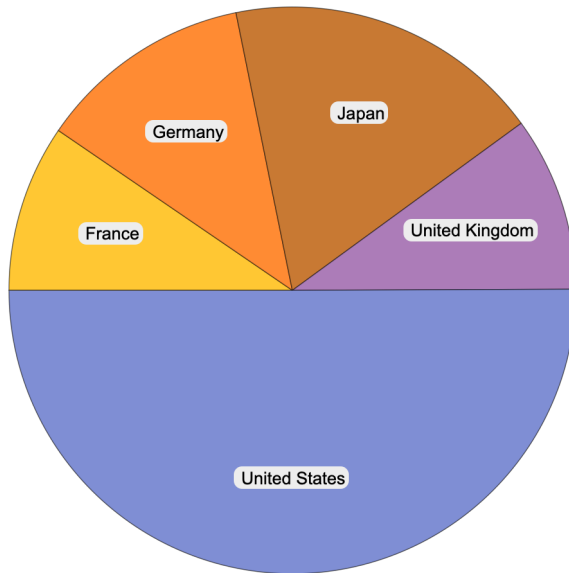


In[712]:=

(* 37.6 *)

PieChart[Labeled[#, "Population"], #] & /@ countries]

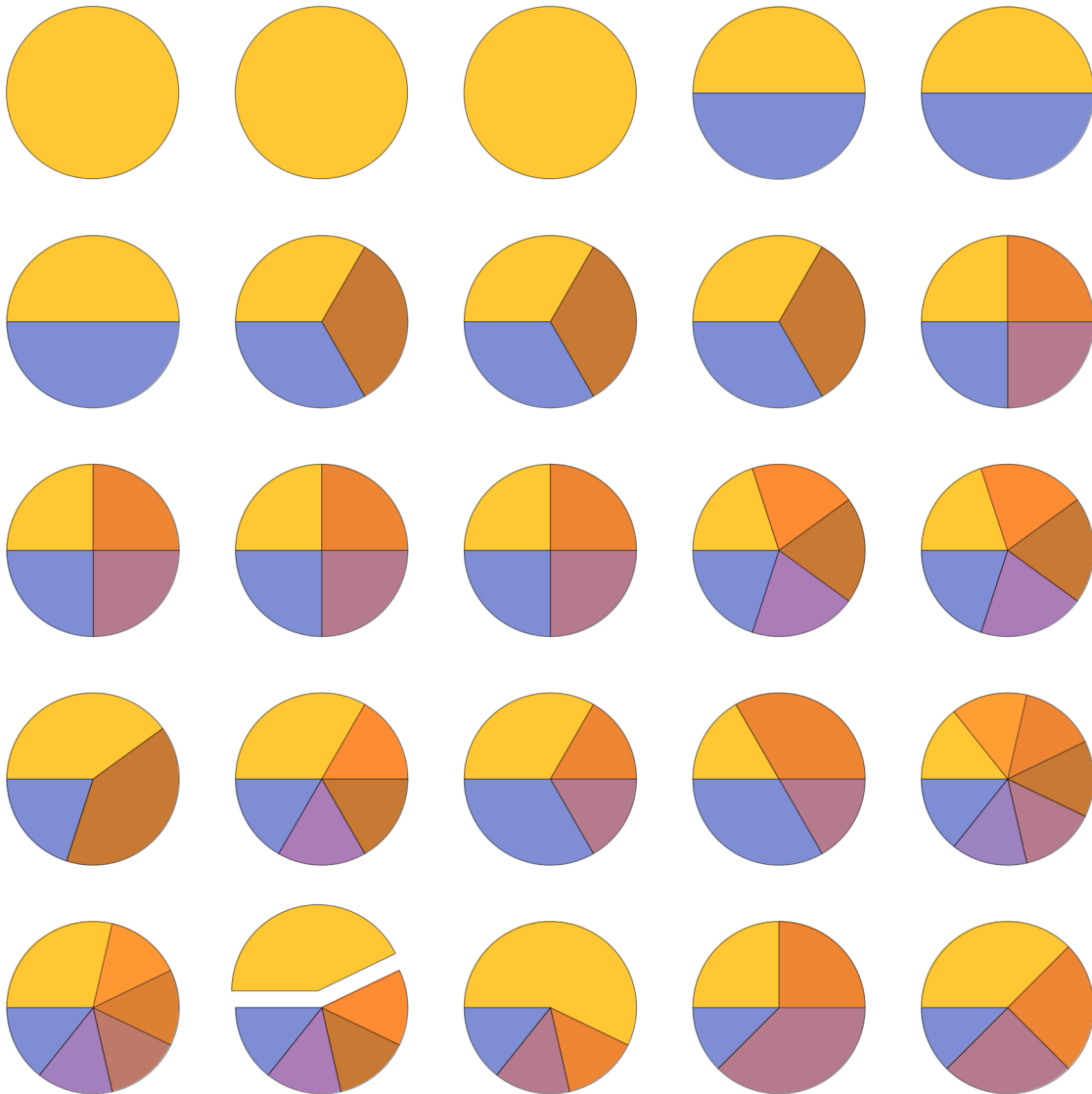
Out[712]=



In[721]:=

```
(* 37.7 *) pieCharts = PieChart[Counts[#]] & /@ Array[IntegerDigits[2^#, 25];  
GraphicsGrid[Partition[pieCharts, 5]]
```

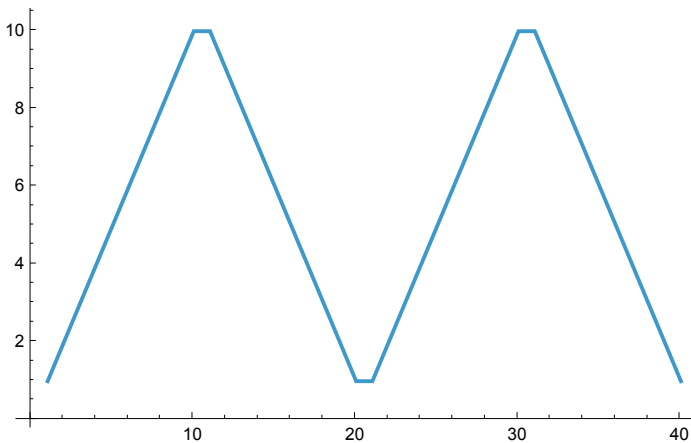
Out[722]=



In[754]:=

```
(* 38.4 *) Module[{r = Range[10]}, ListLinePlot[Join[r, Reverse[r], r, Reverse[r]]]]
```

Out[754]:=



In[755]:=

```
(* 38.5 *) (* First, here is what we are trying to make more simply *)
{Range[10] + 1, Range[10] - 1, Reverse[Range[10]]}
```

Out[755]:=

```
{{2, 3, 4, 5, 6, 7, 8, 9, 10, 11},
 {0, 1, 2, 3, 4, 5, 6, 7, 8, 9}, {10, 9, 8, 7, 6, 5, 4, 3, 2, 1}}
```

```
(* 38.6 *) (* First, here is what we are trying to make more simply *)
Module[{u = 10}, Join[{u}, Table[u = Mod[17 u + 2, 11], 20]]]
```

Out[747]:=

```
{10, 7, 0, 2, 3, 9, 1, 8, 6, 5, 10, 7, 0, 2, 3, 9, 1, 8, 6, 5, 10}
```

In[749]:=

```
Module[{u = 10}, u]
```

Out[749]:=

```
10
```

In[748]:=

```
Table[u = Mod[17 u + 2, 11], 20]
```

```
*** $RecursionLimit: Recursion depth of 1024 exceeded. ⓘ
```

```
*** $RecursionLimit: Recursion depth of 1024 exceeded. ⓘ
```

Out[748]:=

```
{TerminatedEvaluation[RecursionLimit],
 Mod[2 + 17 TerminatedEvaluation[RecursionLimit], 11],
 Mod[2 + 17 Mod[2 + 17 TerminatedEvaluation[RecursionLimit], 11], 11],
 Mod[2 + 17 Mod[2 + 17 Mod[2 + 17 TerminatedEvaluation[RecursionLimit], 11], 11], 11],
 Mod[2 + 17 Mod[
 2 + 17 Mod[2 + 17 Mod[2 + 17 TerminatedEvaluation[RecursionLimit], 11], 11], 11],
 11], Mod[2 + 17 Mod[2 + 17 Mod[2 + 17 Mod[2 + 17
 TerminatedEvaluation[RecursionLimit], 11], 11], 11], 11],
 Mod[2 + 17 Mod[2 + 17 Mod[2 + 17 Mod[2 + 17 Mod[2 + 17 TerminatedEvaluation[
 RecursionLimit], 11], 11], 11], 11], 11], Mod[2 +
```

[illegible]


```

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    2 + 17 Mod[2 + 17 Mod[2 + 17 Mod[2 + 17 Mod[2 + 17 Mod[2 + 17 Mod[2 +
        2 + 17 Mod[2 + 17 Mod[2 + 17 Mod[2 + 17 Mod[2 + 17 Mod[2 +
            17 TerminatedEvaluation[RecursionLimit],
                11], 11], 11], 11], 11], 11], 11], 11], 11], 11],
                11], 11], 11], 11], 11], 11], 11], 11], 11],
Mod[2 + 17 Mod[2 + 17 Mod[2 + 17 Mod[2 + 17 Mod[2 + 17 Mod[2 + 17 Mod[2 +
    17 Mod[2 + 17 Mod[2 + 17 Mod[2 + 17 Mod[2 + 17 Mod[2 + 17 Mod[2 + 17 Mod[2 +
        2 + 17 Mod[2 + 17 Mod[2 + 17 Mod[2 + 17 Mod[2 + 17 Mod[2 +
            17 TerminatedEvaluation[RecursionLimit],
                11], 11], 11], 11], 11], 11], 11], 11], 11], 11],
                11], 11], 11], 11], 11], 11], 11], 11], 11], 11]]}

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