Walker — PS 12 — 2025-03-21

EIWL3 Sections 31 and 32

Section 31

```
In[ ]:= IntegerDigits[2^1000][[-5 ;; -1]]
```
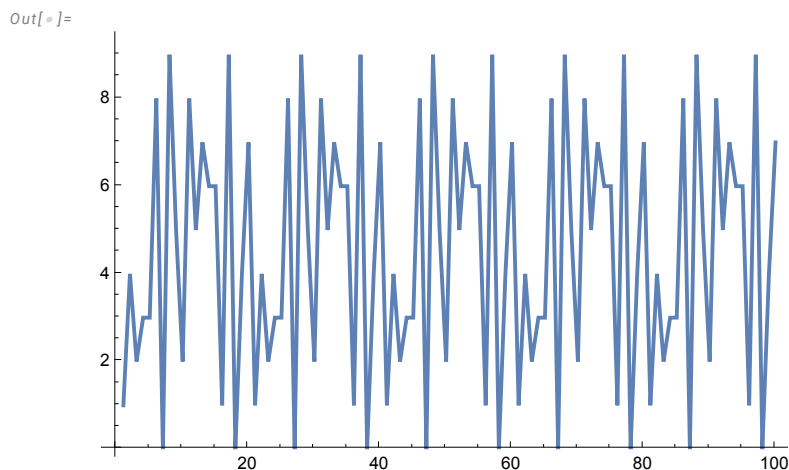
```
Out[ ]=
       {6, 9, 3, 7, 6}
```

```
In[ ]:= Alphabet[][[11 ;; 20]]
```

```
Out[ ]=
       {k, l, m, n, o, p, q, r, s, t}
```

```
In[ ]:= Transpose[Partition[Alphabet[], 2]][[2]]
```

```
Out[ ]=
       {b, d, f, h, j, l, n, p, r, t, v, x, z}
```

```
In[ ]:= ListLinePlot[Part[#, -2] & /@ IntegerDigits /@ Table[12^n, {n, 1, 100}]]
```

```
Out[ ]=
```



```
In[ ]:= TakeSmallest[Join[Table[n^2, {n, 20}], Table[n^3, {n, 20}]], 10]
```
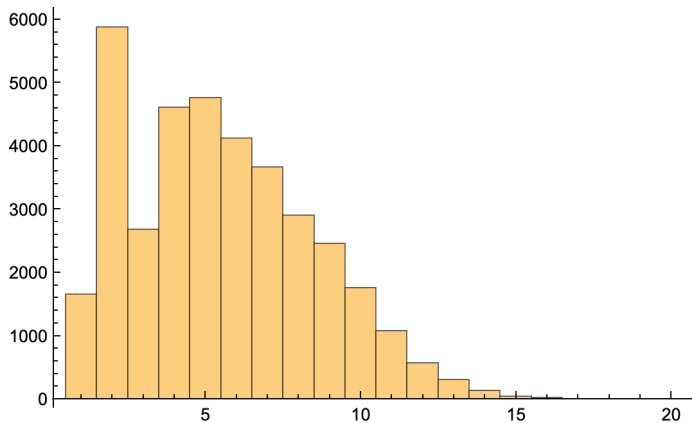
```
Out[ ]=
       {1, 1, 4, 8, 9, 16, 25, 27, 36, 49}
```

```
In[ ]:= Flatten[Position[TextWords[WikipediaData["computers"]], "software"]]
```

```
Out[ ]=
       {62, 6124, 6218, 6240, 6980, 7002, 7005, 7009, 7023, 8226, 8327, 8334, 8342, 8364}
```

In[ ]:= `Histogram[Last /@ Position[Characters /@ WordList[], "e"]]`

Out[ ]=

In[ ]:= `If[IntegerQ[Sqrt[#]], Red, #] & /@ Table[n^3, {n, 100}]`

Out[ ]=

{■, 8, 27, ■, 125, 216, 343, 512, ■, 1000, 1331, 1728, 2197, 2744, 3375, ■, 4913, 5832,
6859, 8000, 9261, 10 648, 12 167, 13 824, ■, 17 576, 19 683, 21 952, 24 389, 27 000,
29 791, 32 768, 35 937, 39 304, 42 875, ■, 50 653, 54 872, 59 319, 64 000, 68 921,
74 088, 79 507, 85 184, 91 125, 97 336, 103 823, 110 592, ■, 125 000, 132 651, 140 608,
148 877, 157 464, 166 375, 175 616, 185 193, 195 112, 205 379, 216 000, 226 981,
238 328, 250 047, ■, 274 625, 287 496, 300 763, 314 432, 328 509, 343 000, 357 911,
373 248, 389 017, 405 224, 421 875, 438 976, 456 533, 474 552, 493 039, 512 000, ■,
551 368, 571 787, 592 704, 614 125, 636 056, 658 503, 681 472, 704 969, 729 000,
753 571, 778 688, 804 357, 830 584, 857 375, 884 736, 912 673, 941 192, 970 299, ■}

In[ ]:= `If[IntegerDigits[#]〚1〛 < 5, Nothing, #] & /@ Prime[Range[100]]`

Out[ ]=

{5, 7, 53, 59, 61, 67, 71, 73, 79, 83, 89, 97, 503, 509, 521, 523, 541}

In[ ]:= `Grid[`
`  NestList[ReplacePart[#, Position[#, RandomChoice[#]] → Nothing] &, Range[10], 9]]`

Out[ ]=

```
1 2 3 4  5  6  7  8  9 10
1 3 4 5  6  7  8  9 10
1 3 5 6  7  8  9 10
1 5 6 7  8  9 10
5 6 7 8  9 10
6 7 8 9 10
7 8 9 10
7 8 9
7 8
7
```

In[ ]:= `TakeLargestBy[WordList[], StringLength, 10]`

Out[ ]=

{electroencephalographic, electroencephalograph,
 counterrevolutionary, buckminsterfullerene,
 compartmentalization, electroencephalogram, internationalization,
 uncharacteristically, magnetohydrodynamics, incomprehensibility}

In[ ]:= `TakeLargestBy[IntegerName /@ Range[100], Length[Position[Characters[#], "e"]] &, 5]`

Out[ ]=

{seventy-three, seventeen, seventy-seven, nineteen, eleven}

Section 32

In[ ]:= `Cases[Cases[IntegerDigits[Range[1000]], {1, __, 9}], {__, _, _}]`

Out[ ]=

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

In[ ]:= `Cases[IntegerDigits[Range[1000]], {x_, x_, x_}]`

Out[ ]=

{{1, 1, 1}, {2, 2, 2}, {3, 3, 3}, {4, 4, 4},
 {5, 5, 5}, {6, 6, 6}, {7, 7, 7}, {8, 8, 8}, {9, 9, 9}}

In[ ]:= `Cases[IntegerDigits[Range[1000]^2], {9, __, 0 | 1}]`

Out[ ]=

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

In[ ]:= `IntegerDigits[Range[100]] /. 0 → Gray /. 9 → Orange`

Out[ ]=

{{1}, {2}, {3}, {4}, {5}, {6}, {7}, {8}, {■}, {1, ■}, {1, 1}, {1, 2}, {1, 3},
 {1, 4}, {1, 5}, {1, 6}, {1, 7}, {1, 8}, {1, ■}, {2, ■}, {2, 1}, {2, 2},
 {2, 3}, {2, 4}, {2, 5}, {2, 6}, {2, 7}, {2, 8}, {2, ■}, {3, ■}, {3, 1}, {3, 2},
 {3, 3}, {3, 4}, {3, 5}, {3, 6}, {3, 7}, {3, 8}, {3, ■}, {4, ■}, {4, 1}, {4, 2},
 {4, 3}, {4, 4}, {4, 5}, {4, 6}, {4, 7}, {4, 8}, {4, ■}, {5, ■}, {5, 1}, {5, 2},
 {5, 3}, {5, 4}, {5, 5}, {5, 6}, {5, 7}, {5, 8}, {5, ■}, {6, ■}, {6, 1}, {6, 2},
 {6, 3}, {6, 4}, {6, 5}, {6, 6}, {6, 7}, {6, 8}, {6, ■}, {7, ■}, {7, 1}, {7, 2},
 {7, 3}, {7, 4}, {7, 5}, {7, 6}, {7, 7}, {7, 8}, {7, ■}, {8, ■}, {8, 1}, {8, 2},
 {8, 3}, {8, 4}, {8, 5}, {8, 6}, {8, 7}, {8, 8}, {8, ■}, {■, ■}, {■, 1},
 {■, 2}, {■, 3}, {■, 4}, {■, 5}, {■, 6}, {■, 7}, {■, 8}, {■, ■}, {1, ■, ■}}

In[ ]:= `IntegerDigits[2^1000] /. 0 → Red`

Out[ ]=

{1, ■, 7, 1, 5, ■, 8, 6, ■, 7, 1, 8, 6, 2, 6, 7, 3, 2, ■, 9, 4, 8, 4, 2, 5, ■, 4, 9,
 ■, 6, ■, ■, ■, 1, 8, 1, ■, 5, 6, 1, 4, ■, 4, 8, 1, 1, 7, ■, 5, 5, 3, 3, 6, ■,
 7, 4, 4, 3, 7, 5, ■, 3, 8, 8, 3, 7, ■, 3, 5, 1, ■, 5, 1, 1, 2, 4, 9, 3, 6, 1, 2,
 2, 4, 9, 3, 1, 9, 8, 3, 7, 8, 8, 1, 5, 6, 9, 5, 8, 5, 8, 1, 2, 7, 5, 9, 4, 6, 7, 2,
 9, 1, 7, 5, 5, 3, 1, 4, 6, 8, 2, 5, 1, 8, 7, 1, 4, 5, 2, 8, 5, 6, 9, 2, 3, 1, 4, ■,
 4, 3, 5, 9, 8, 4, 5, 7, 7, 5, 7, 4, 6, 9, 8, 5, 7, 4, 8, ■, 3, 9, 3, 4, 5, 6, 7, 7,
 7, 4, 8, 2, 4, 2, 3, ■, 9, 8, 5, 4, 2, 1, ■, 7, 4, 6, ■, 5, ■, 6, 2, 3, 7, 1, 1,
 4, 1, 8, 7, 7, 9, 5, 4, 1, 8, 2, 1, 5, 3, ■, 4, 6, 4, 7, 4, 9, 8, 3, 5, 8, 1, 9, 4,
 1, 2, 6, 7, 3, 9, 8, 7, 6, 7, 5, 5, 9, 1, 6, 5, 5, 4, 3, 9, 4, 6, ■, 7, 7, ■, 6,
 2, 9, 1, 4, 5, 7, 1, 1, 9, 6, 4, 7, 7, 6, 8, 6, 5, 4, 2, 1, 6, 7, 6, 6, ■, 4, 2, 9,
 8, 3, 1, 6, 5, 2, 6, 2, 4, 3, 8, 6, 8, 3, 7, 2, ■, 5, 6, 6, 8, ■, 6, 9, 3, 7, 6}

In[ ]:= `Characters["The Wolfram Language"] /. "a" | "e" | "i" | "o" | "u" → Nothing`

Out[ ]=

{T, h, , W, l, f, r, m, , L, n, g, g}

In[ ]:= `Cases[IntegerDigits[2^1000], 0 | 1]`

Out[ ]=

{1, 0, 1, 0, 0, 1, 0, 0, 0, 0, 0, 0, 1, 1, 0, 1, 0, 1, 1, 0, 0, 0, 0, 1, 0, 1, 1, 1, 1, 1, 1,
 1, 1, 1, 1, 1, 0, 0, 0, 1, 0, 0, 0, 1, 1, 1, 1, 1, 0, 1, 1, 1, 0, 0, 1, 1, 1, 1, 0, 1, 0, 0}

In[ ]:= `Cases[IntegerDigits[Range[100, 999]], {x_, __, x_}]`

Out[ ]=

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