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# Hexi—PS12—2025 - 03 - 21

## Exercises from EIWL3 Section 31

In[627]:=

```
Take[IntegerDigits[2^1000], -5]
```

Out[627]=

```
{6, 9, 3, 7, 6}
```

In[628]:=

```
Take[Alphabet[], {10, 20}]
```

Out[628]=

```
{j, k, l, m, n, o, p, q, r, s, t}
```

In[629]:=

```
Table[FromLetterNumber[n], {n, 2, 26, 2}]
```

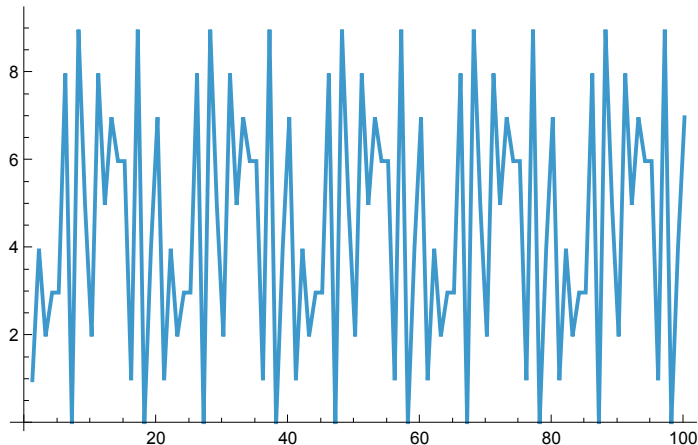
Out[629]=

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

In[630]:=

```
ListLinePlot[Table[IntegerDigits[12^n][[-2]], {n, 100}]]
```

Out[630]=



In[631]:=

```
TakeSmallest[Join[#^2 & /@ Range[20], #^3 & /@ Range[20]], 10]
```

Out[631]=

```
{1, 1, 4, 8, 9, 16, 25, 27, 36, 49}
```

In[632]:=

```
StringPosition[WikipediaData["computers"], "software"]
```

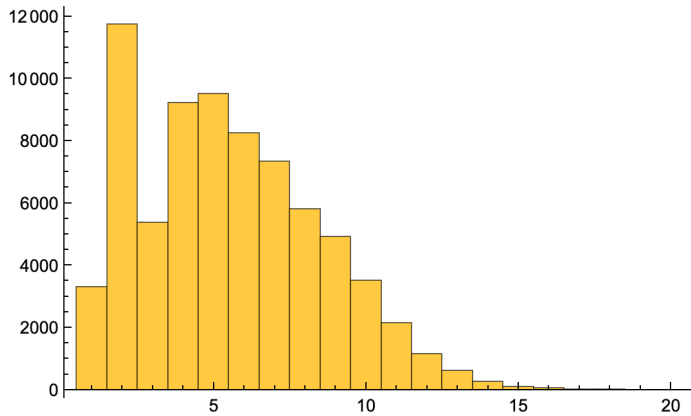
Out[632]=

```
{{410, 417}, {38125, 38132}, {39662, 39669}, {40223, 40230}, {40352, 40359},  
{45085, 45092}, {45244, 45251}, {45269, 45276}, {45301, 45308}, {45384, 45391},  
{52958, 52965}, {53685, 53692}, {53738, 53745}, {53812, 53819}, {53975, 53982}}
```

In[633]:=

**Histogram[Flatten[StringPosition[WordList[], "e"]]]**

Out[633]=



In[634]:=

```
positions = Flatten[Position[Table[n^3, {n, 100}], #] & /@
  Select[Table[n^3, {n, 100}], IntegerQ[Sqrt[#]] &]];
ReplacePart[Table[n^3, {n, 100}], Thread[positions → Red]]
```

Out[635]=

```
{■, 8, 27, ■, 125, 216, 343, 512, ■, 1000, 1331, 1728, 2197, 2744, 3375, ■, 4913, 5832,
  6859, 8000, 9261, 10648, 12167, 13824, ■, 17576, 19683, 21952, 24389, 27000,
  29791, 32768, 35937, 39304, 42875, ■, 50653, 54872, 59319, 64000, 68921,
  74088, 79507, 85184, 91125, 97336, 103823, 110592, ■, 125000, 132651, 140608,
  148877, 157464, 166375, 175616, 185193, 195112, 205379, 216000, 226981,
  238328, 250047, ■, 274625, 287496, 300763, 314432, 328509, 343000, 357911,
  373248, 389017, 405224, 421875, 438976, 456533, 474552, 493039, 512000, ■,
  551368, 571787, 592704, 614125, 636056, 658503, 681472, 704969, 729000,
  753571, 778688, 804357, 830584, 857375, 884736, 912673, 941192, 970299, ■}
```

In[636]:=

**Select[Prime /@ Range[100], IntegerDigits[#][[1]] ≥ 5 &]**

Out[636]=

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

In[637]:=

**Grid[NestList[Delete[#, RandomInteger[{1, Length[#]}]] &, Range[10], 9]]**

Out[637]=

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

```

In[638]:=
TakeLargestBy[WordList[], StringLength, 10]

Out[638]=
{electroencephalographic, electroencephalograph,
 buckminsterfullerene, compartmentalization,
 counterrevolutionary, electroencephalogram, internationalization,
 magnetohydrodynamics, uncharacteristically, counterintelligence}

In[639]:=
TakeLargestBy[IntegerName /@ Range[100], StringLength, 5]

Out[639]=
{seventy-three, seventy-seven, seventy-eight, twenty-three, twenty-seven}

In[640]:=
TakeLargestBy[IntegerName /@ Range[100], StringCount[#, "e"] &, 5]

Out[640]=
{seventeen, seventy-three, seventy-seven, eleven, eighteen}

```

## Exercises from EIWL3 Section 32

```

In[641]:=
Cases[IntegerDigits[Range[1000]], {1, __, 9}]

Out[641]=
{{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[642]:=
Cases[IntegerDigits[Range[1000]], {x_, x_, x_}]

Out[642]=
{{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[643]:=
Cases[IntegerDigits[#^2 & /@ Range[1000]], {9, __, 1 | 0}]






























Out[643]=
{{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[644]:=

**IntegerDigits[Range[100]] /. {0 → Gray, 9 → Orange}**





























Out[644]=

```
{ {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, }, {}}
```

In[645]:=

**IntegerDigits[2^1000] /. {0 → Red}**

Out[645]=

```
{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[646]:=

**Characters["The Wolfram Language"] /. Thread[{"a", "e", "i", "o", "u"} → Nothing]**

Out[646]=

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

In[647]:=

**Cases[IntegerDigits[2^1000], 0 | 1]**

Out[647]=

```
{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[648]:=

**Cases[IntegerDigits[Range[100, 999]], {x\_, \_\_, x\_}]**

Out[648]=

```
{ {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} }
```