

Harper — PS 11 — 2025-03-21

EIWL3 Sections 31 and 32

Section 31

In[649]:=

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

Out[649]=

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

In[650]:=

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

Out[650]=

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

In[651]:=

```
Part[Alphabet[], Range[2, Length[Alphabet[]], 2]]
```

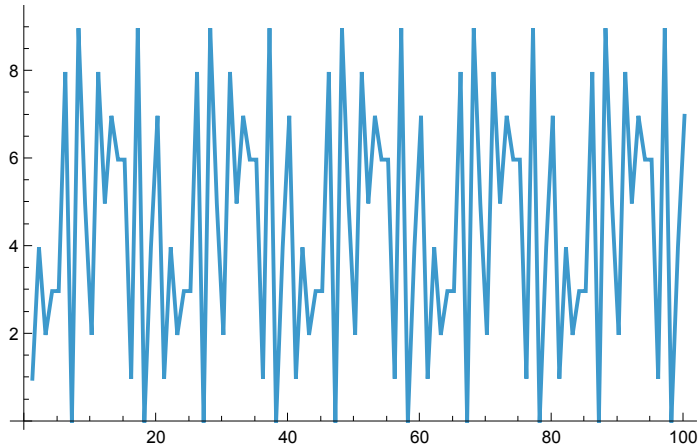
Out[651]=

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

In[652]:=

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

Out[652]=



In[653]:=

```
TakeSmallest[Join[Table[n^2, {n, 20}], Table[n^3, {n, 20}]], 10]
```

Out[653]=

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

In[654]:=

```
Position[TextWords[WikipediaData["Computers"]], "software"]
```

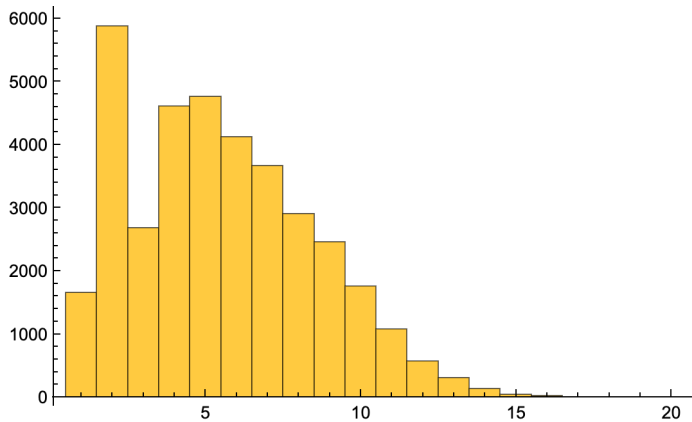
Out[654]=

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

In[655]:=

```
Histogram[Flatten[Position[Characters[#], "e"] & /@ WordList[]]]
```

Out[655]:=



In[656]:=

```
ReplacePart[Table[n^3, {n, 100}], Thread[Table[n^2, {n, 10}] → Red]]
```

Out[656]:=

```
{
  1, 8, 27, 64, 125, 216, 343, 512, 729, 1000, 1331, 1728, 2197, 2744, 3375, 4096, 4913, 5832,
  6859, 8000, 9261, 10648, 12167, 13824, 15625, 17576, 19683, 21952, 24389, 27000,
  29791, 32768, 35937, 39304, 42875, 46656, 50653, 54872, 59319, 64000, 68921,
  74088, 79507, 85184, 91125, 97336, 103823, 110592, 117725, 125000, 132651, 140608,
  148877, 157464, 166375, 175616, 185193, 195112, 205379, 216000, 226981,
  238328, 250047, 262064, 274485, 287316, 300563, 314232, 328329, 342860, 357931,
  373548, 389717, 406444, 423735, 441596, 459933, 478752, 498061, 517866, 538173,
  558988, 579317, 599166, 619541, 639448, 659893, 680883, 701424, 721521, 742180,
  762507, 782508, 803189, 823556, 843605, 863343, 883776, 903911, 923754, 943301, 962558, 981531, 1000224, 1018643, 1036784, 1054653, 1072256, 1089599, 1106688, 1123529, 1140128, 1156491, 1172624, 1188533, 1204214, 1219673, 1234916, 1249949, 1264778, 1279409, 1293838, 1308063, 1322080, 1335895, 1349504, 1362914, 1376121, 1389132, 1401944, 1414554, 1426969, 1439185, 1451200, 1463011, 1474616, 1486022, 1497236, 1508255, 1519076, 1529696, 1540112, 1550331, 1560350, 1570166, 1579776, 1589187, 1598405, 1607428, 1616252, 1624875, 1633294, 1641516, 1649538, 1657357, 1664971, 1672387, 1679602, 1686614, 1693421, 1700031, 1706442, 1712651, 1718656, 1724464, 1730073, 1735481, 1740686, 1745686, 1750488, 1755089, 1759487, 1763680, 1767666, 1771452, 1775036, 1778416, 1781589, 1784553, 1787315, 1789874, 1792228, 1794375, 1796312, 1798038, 1799551, 1800850, 1801933, 1802808, 1803473, 1803927, 1804169, 1804298, 1804312, 1804210, 1803901, 1803384, 1802657, 1801719, 1800569, 1799206, 1797629, 1795836, 1793825, 1791595, 1789144, 1786471, 1783584, 1780481, 1777161, 1773623, 1769865, 1765886, 1761685, 1757261, 1752612, 1747737, 1742635, 1737305, 1731745, 1725954, 1719931, 1713674, 1707181, 1699451, 1691482, 1683273, 1674823, 1666131, 1657196, 1648016, 1638590, 1628917, 1618996, 1608825, 1598403, 1587729, 1576801, 1565618, 1554179, 1542483, 1530529, 1518316, 1505843, 1493109, 1479113, 1464854, 1450331, 1435543, 1420489, 1405168, 1389579, 1373721, 1357593, 1341194, 1324523, 1307579, 1290361, 1272868, 1255099, 1237053, 1218729, 1200126, 1181243, 1162069, 1142603, 1122845, 1102794, 1082450, 1061811, 1040877, 1019647, 998121, 976298, 954177, 931757, 909037, 886016, 862693, 839067, 815137, 790902, 766361, 741514, 716361, 690901, 665133, 639056, 612671, 585977, 558973, 531659, 504034, 476097, 447848, 419286, 390411, 361223, 331721, 301904, 271771, 241321, 210553, 179467, 148063, 116340, 84297, 51934, 19250, -13043, -46047, -78170, -108801, -137929, -165544, -191645, -216232, -239305, -260863, 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46851, 48091, 49275, 50403, 51475, 52491, 53451, 54355, 55203, 55995, 56731, 57411, 58035, 58603, 59115, 59571, 59971, 60315, 60603, 60835, 61011, 61131, 61195, 61203, 61155, 61051, 60891, 60675, 60403, 60075, 59691, 59251, 58755, 58203, 57595, 56931, 56211, 55435, 54603, 53715, 52771, 51771, 50715, 49603, 48435, 47211, 45931, 44595, 43203, 41755, 40251, 38691, 37075, 35403, 33671, 31885, 30043, 28145, 26191, 24181, 22115, 19991, 17809, 15569, 13271, 10925, 8531, 6089, 3599, 1069, -1219, -3469, -5699, -7948, -10285, -12709, -15219, -17815, -20495, -23255, -26095, -28915, -31815, -34795, -37845, -40965, -44155, -47415, -50745, -54145, -57615, -61155, -64765, -68445, -72195, -76015, -79905, -83865, -87895, -91995, -96165, -100405, -104715, -109095, -113545, -118065, -122655, -127315, -132045, -136845, -141715, -146655, -151665, -156745, -161895, -167115, -172405, -177765, -183195, -188695, -194265, -199905, -205615, -211395, -217245, -223165, -229155, -235215, -241345, -247545, -253815, 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```

```

In[659]:=
TakeLargestBy[WordList[], StringLength, 10]

Out[659]=
{electroencephalographic, electroencephalograph,
 buckminsterfullerene, compartmentalization,
 counterrevolutionary, electroencephalogram, internationalization,
 magnetohydrodynamics, uncharacteristically, counterintelligence}

In[660]:=
TakeLargestBy[IntegerName[Range[100]], StringLength, 5]

Out[660]=
{seventy-three, seventy-seven, seventy-eight, twenty-three, twenty-seven}

In[661]:=
TakeLargestBy[Array[IntegerName, 100], Count[Characters[#], "e"] &, 5]

Out[661]=
{seventeen, seventy-three, seventy-seven, eleven, eighteen}

In[662]:=

```

Section 32

```

In[663]:=
Cases[IntegerDigits[Range[1000]], {1, __, 9}]

Out[663]=
{{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[664]:=
Cases[IntegerDigits[Range[1000]], {x_, x_, x_}]

Out[664]=
{{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[665]:=
Cases[IntegerDigits[Range[1000]^2], {9, __, 0 | 1}]
































Out[665]=
{{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[666]:=

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





























Out[666]=

```
{ {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[667]:=

IntegerDigits[2^1000] /. {0 → Red}

Out[667]=

```
{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[668]:=

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

Out[668]=

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

In[669]:=

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

Out[669]=

```
{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[670]:=

Cases[IntegerDigits[Range[100, 999]], {x_, __, x_}]

Out[670]=

```
{ {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} }
```