In[8]:=
```
a = Table[Sum[RandomInteger[10] x^n, {n, 1, 5}], 100] // TableForm
```

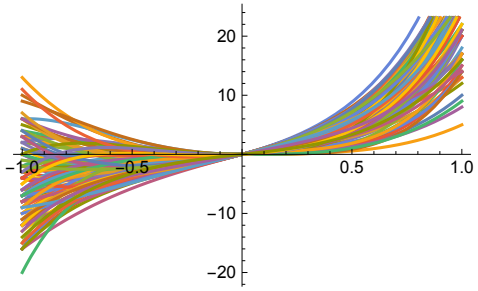
Out[8]//TableForm=

$7x + 7x^2 + x^3 + 3x^4 + 6x^5$
$10x + x^2 + 9x^3 + 7x^4 + x^5$
$7x + 7x^2 + 5x^3 + 7x^4 + 2x^5$
$8x + 8x^2 + 6x^3 + x^4 + 10x^5$
$3x + 3x^2 + 6x^3 + x^4 + 8x^5$
$6x + 10x^2 + 8x^3 + 10x^4 + 7x^5$
$6x + x^2 + 5x^4 + 8x^5$
$6x + 4x^2 + 6x^3 + 3x^4 + x^5$
$10x + 2x^2 + 5x^3 + 10x^4$
$2x + 7x^2 + 9x^3 + 8x^4 + 4x^5$
$7x + 10x^2 + 4x^4 + 4x^5$
$9x + 3x^2 + 5x^3 + 4x^4 + 8x^5$
$4x + 6x^2 + 9x^3 + 6x^4 + 6x^5$
$6x + x^2 + 5x^3 + 3x^4 + 6x^5$
$2x + x^2 + 4x^3 + 7x^4 + x^5$
$7x^2 + 8x^3 + 7x^4$
$5x + 9x^2 + x^3 + 6x^4 + x^5$
$3x + 8x^2 + 8x^3 + 8x^4 + 10x^5$
$3x + 8x^2 + 9x^3 + x^4 + 6x^5$
$2x + 9x^2 + 3x^4 + 5x^5$
$3x + 4x^2 + 10x^3 + 10x^4 + 3x^5$
$7x^2 + 3x^3 + 8x^4$
$7x + 6x^2 + 3x^3 + 4x^4 + 9x^5$
$6x + 10x^2 + 7x^3 + 2x^4 + 2x^5$
$8x + 4x^2 + 6x^3 + 8x^4 + 2x^5$
$3x + 4x^2 + 9x^4 + x^5$
$6x + x^2 + 4x^3 + 10x^4 + 5x^5$
$6x + 6x^2 + 3x^3 + 2x^4 + 3x^5$
$x + 3x^2 + 2x^3 + 7x^4$
$10x + x^2 + 7x^3 + 6x^4 + x^5$
$3x + 4x^2 + 2x^3 + 10x^4 + 10x^5$
$9x + 8x^2 + 5x^3 + 8x^4 + 3x^5$
$4x + 3x^2 + 7x^3 + 2x^4 + x^5$
$8x + 5x^2 + 10x^3 + 5x^4$
$x + x^2 + 5x^3 + 9x^4 + 6x^5$
$9x + 3x^2 + 8x^3 + 3x^4 + 8x^5$
$3x + 8x^2 + 9x^3 + x^4 + 9x^5$
$5x + 7x^2 + 2x^4 + 8x^5$
$6x + x^2 + 4x^3 + 10x^4 + 8x^5$
$9x + 7x^2 + 4x^3 + 3x^4 + 3x^5$
$x + 9x^2 + x^3 + x^5$
$7x + 7x^2 + 3x^3 + 10x^4 + 7x^5$
$7x + 4x^2 + 10x^3 + 3x^4 + 8x^5$
$4x + 9x^2 + 7x^3 + 9x^4 + 3x^5$
$3x + 6x^2 + 8x^3 + 7x^4$
$4x + 3x^2 + 3x^3 + 2x^4 + 7x^5$
$9x + 9x^2 + 2x^3 + 5x^4 + 4x^5$
$6x + 9x^2 + 7x^3 + 8x^4 + 3x^5$
$9x + 8x^2 + 5x^4 + 4x^5$
$4x + 2x^2 + 3x^3 + 2x^4 + 6x^5$
$8x + 2x^2 + 9x^3 + 7x^4 + 3x^5$
$4x + 4x^2 + 6x^3 + 2x^4 + 3x^5$
$6x + 5x^3 + 10x^4 + 9x^5$
$9x^2 + 10x^3 + 2x^4 + 2x^5$
$3x + 4x^2 + 9x^3 + 7x^5$
$4x + 8x^2 + 8x^3 + 3x^4 + 6x^5$
$9x + 9x^2 + 10x^3 + 7x^5$

$3x + x^2 + 10x^3 + 8x^4 + 5x^5$
$10x^2 + x^3 + 4x^4 + 6x^5$
$10x^2 + 9x^3 + 9x^4 + 8x^5$
$5x + 6x^2 + 10x^3 + 5x^4 + 10x^5$
$5x^2 + 3x^3 + 5x^4 + 7x^5$
$4x + 7x^2 + 7x^3 + 4x^4 + 6x^5$
$x + 10x^2 + 5x^3 + 7x^4 + 9x^5$
$9x + 10x^3 + 5x^4 + 10x^5$
$2x + 8x^2 + 10x^3 + 4x^5$
$10x + 9x^2 + 7x^3 + 9x^4 + 6x^5$
$x + 3x^2 + 9x^4 + 10x^5$
$7x + 5x^2 + 10x^3 + 10x^4 + 10x^5$
$6x + 6x^2 + 2x^4 + 9x^5$
$3x^2 + 8x^3 + 4x^4 + 3x^5$
$2x + 2x^2 + 3x^3 + 9x^4$
$6x + 5x^2 + 10x^3 + 7x^4 + 4x^5$
$5x + 6x^2 + 5x^4 + 7x^5$
$7x + 7x^2 + 2x^3 + 2x^4$
$5x + 8x^2 + 8x^3 + 4x^4 + 3x^5$
$7x + x^2 + 8x^3 + 10x^4 + 8x^5$
$8x + x^2 + 8x^3 + 4x^5$
$3x^2 + 10x^3 + 2x^4 + 5x^5$
$2x + 6x^2 + 7x^3 + 8x^5$
$2x + 10x^2 + 7x^3 + 10x^4$
$10x^2 + 5x^3 + 3x^4 + 6x^5$
$8x^2 + 6x^3 + 5x^4 + 3x^5$
$10x^2 + 5x^3 + 7x^4 + 4x^5$
$x + 2x^2 + 3x^3 + 10x^5$
$9x + 4x^2 + 7x^3 + 3x^5$
$3x + 3x^2 + 10x^3 + 2x^4 + 8x^5$
$10x + 7x^2 + 7x^3 + 3x^5$
$3x + 9x^2 + 2x^3 + 7x^4 + 10x^5$
$3x + 9x^2 + 3x^3 + 4x^4$
$7x + x^2 + 6x^3 + 8x^4 + 5x^5$
$4x + 7x^2 + 4x^3 + 6x^4 + 7x^5$
$x + 7x^2 + 4x^3 + 5x^4$
$4x + 4x^2 + x^4 + 5x^5$
$2x + 3x^2 + 10x^3 + 5x^4 + x^5$
$7x + 2x^2 + 9x^3 + 9x^4 + 2x^5$
$9x + 2x^2 + 10x^3 + 6x^4 + 4x^5$
$10x + 9x^2 + 3x^3 + 3x^4 + x^5$
$7x + 10x^2 + 9x^3 + 8x^4 + 3x^5$
$2x + 6x^2 + 9x^3 + x^4 + x^5$

In[60]:=
```
Plot[{##}, {x, -1, 1}] &@@ Table[Sum[RandomInteger[10] x^n, {n, 1, 5}], 100]
```

Out[60]=



In[55]:=
```
NSolve[# == 0, x] & /@
  Table[Sum[RandomInteger[10] x^n, {n, 1, 100}], 11] // TableForm
```

Out[55]//TableForm=

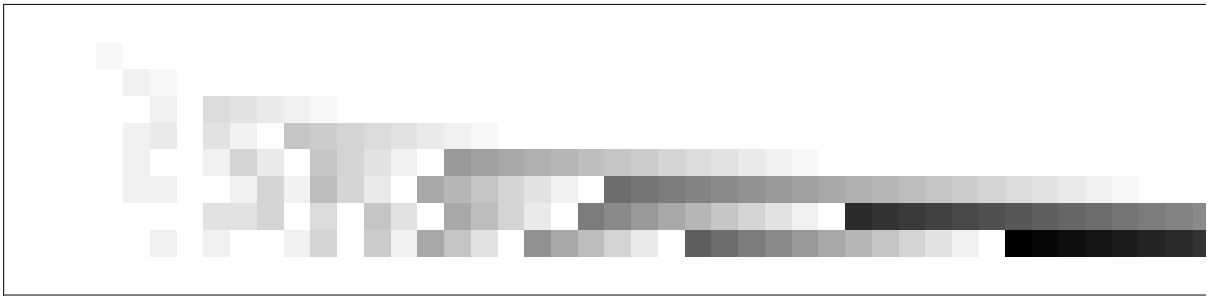
x → −1.03115	x → −1.02745 − 0.114855 i	x → −1.02745 + 0.114855 i
x → −1.33687	x → −0.99644 − 0.0271398 i	x → −0.99644 + 0.0271398 i
x → −1.05508	x → −1.01759 − 0.0199965 i	x → −1.01759 + 0.0199965 i
x → −1.06472 − 0.117427 i	x → −1.06472 + 0.117427 i	x → −1.02564
x → −1.00503 − 0.147937 i	x → −1.00503 + 0.147937 i	x → −1.00214 − 0.0116609 i
x → −1.02955 − 0.0272704 i	x → −1.02955 + 0.0272704 i	x → −0.983177 − 0.145547 i
x → −1.00133 − 0.144167 i	x → −1.00133 + 0.144167 i	x → −0.997893 − 0.186423 i
x → −1.00892 − 0.0545014 i	x → −1.00892 + 0.0545014 i	x → −0.989699 − 0.292142 i
x → −1.06753	x → −0.995916 − 0.0560996 i	x → −0.995916 + 0.0560996 i
x → −1.19741	x → −1.12739 − 0.176836 i	x → −1.12739 + 0.176836 i
x → −0.997223 − 0.118034 i	x → −0.997223 + 0.118034 i	x → −0.995419 − 0.332615 i

Out[91]=
```
{f[f[1], g[1]], f[f[2], g[2]], f[f[3], g[3]], f[f[4], g[4]], f[f[5], g[5]]}
```

Out[162]=
```
Slot[1, n]
```

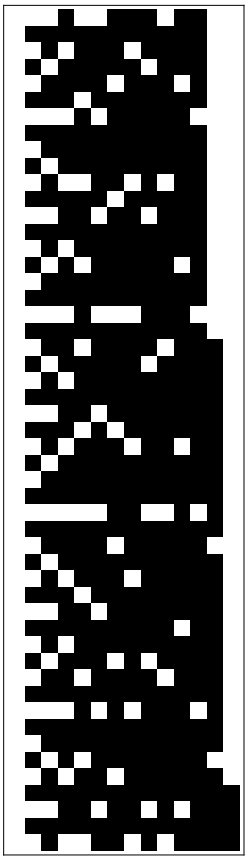
In[227]:=
```
(If[PrimeQ[# + 1] && PrimeQ[# - 1], #, Nothing] & /@ (Range[100]) //
   Mod[#, Range[#]] &) // ArrayPlot
```

Out[227]=



In[244]:=
```
If[# > 0, 1, 0] & /@ Mod[#, Range[Sqrt[#]]] & /@ (Range[150, 200]) // ArrayPlot
```

Out[244]=



In[309]:=
```
Clear[x, a]
```

In[347]:=
```
f[x_, y_] := Module[{a}, (Mod[x, Range[x]] ~Join~ Table[x, {y}]) +
     (Mod[y, Range[y]] ~Join~ Table[y, {x}]) //
   ReplacePart[#, (a Reverse[Range[(Position[#, x + y] // Length)]]) +
        Flatten@Position[#, x + y] /. (Plus → Rule) /. a -> 1] &]
```

In[349]:=
```
f[7, 5]
```

Out[349]=
```
{0, 2, 3, 4, 2, 6, 5, 5, 4, 3, 2, 1}
```

In[299]:=
```
{0, 1, 3, 3, 0, 9, 8, 7, 6, 5, 15, 15, 15, 15, 15} //
 ReplacePart[#, (x Range[(Position[#, 15] // Length)]) +
      Flatten@Position[#, 15] /. Plus → Rule /. x → 1] &
```

Out[299]=
```
{0, 1, 3, 3, 0, 9, 8, 7, 6, 5, 1, 2, 3, 4, 5}
```

In[288]:=
```
{{11}, {12}, {13}, {14}, {15}} // Flatten
```

In[292]:=
```
x Range[5] + {11, 12, 13, 14, 15}
```

In[294]:=
```
{11 + x, 12 + 2 x, 13 + 3 x, 14 + 4 x, 15 + 5 x} /. Plus → Rule /. x → 1
```

Out[294]=
```
{11 → 1, 12 → 2, 13 → 3, 14 → 4, 15 → 5}
```

In[273]:=
```
Mod[10, Range[14]]
```

Out[273]=
```
{0, 0, 1, 2, 0, 4, 3, 2, 1, 0, 10, 10, 10, 10}
```

In[247]:=
```
Table[x, {10}]
```

In[248]:=
```
{x, x, x, x, x, x, x, x, x, x}~Join~{1, 2}
```

Out[248]=
```
{x, x, x, x, x, x, x, x, x, x, 1, 2}
```

In[346]:=
```
Table[FindSequenceFunction[Times @@@ IntegerPartitions[n, {2}], x],
  {n, 8, 100}] // TableForm
```

Out[346]//TableForm=

$8\ x - x^2$
$9\ x - x^2$
$10\ x - x^2$
$11\ x - x^2$
$12\ x - x^2$
$13\ x - x^2$
$14\ x - x^2$
$15\ x - x^2$
$16\ x - x^2$
$17\ x - x^2$
$18\ x - x^2$
$19\ x - x^2$
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$21\ x - x^2$
$22\ x - x^2$
$23\ x - x^2$
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$92\ x - x^2$
$93\ x - x^2$
$94\ x - x^2$
$95\ x - x^2$
$96\ x - x^2$
$97\ x - x^2$
$98\ x - x^2$
$99\ x - x^2$
$100\ x - x^2$

In[337]:= **FindSequenceFunction[{19, 36, 51, 64, 75, 84, 91, 96, 99, 100}, n]**

In[340]:= **20 n - n^2 /. n -> Range[100]**

Out[340]= {19, 36, 51, 64, 75, 84, 91, 96, 99, 100, 99, 96, 91, 84, 75, 64, 51, 36, 19, 0, -21,
-44, -69, -96, -125, -156, -189, -224, -261, -300, -341, -384, -429, -476,
-525, -576, -629, -684, -741, -800, -861, -924, -989, -1056, -1125, -1196,
-1269, -1344, -1421, -1500, -1581, -1664, -1749, -1836, -1925, -2016, -2109,
-2204, -2301, -2400, -2501, -2604, -2709, -2816, -2925, -3036, -3149, -3264,
-3381, -3500, -3621, -3744, -3869, -3996, -4125, -4256, -4389, -4524, -4661,
-4800, -4941, -5084, -5229, -5376, -5525, -5676, -5829, -5984, -6141, -6300,
-6461, -6624, -6789, -6956, -7125, -7296, -7469, -7644, -7821, -8000}