In[1]:=

In[8]:=

```
def greedy_coins(Value):
    coins = [ 2, 5, 10, 20, 50,100, 500 ]
    n = len(coins) - 1
    result = []
    L=0
    while n >= 0 :
        while Value >= coins[n]:
            Value -= coins[n]
            result.append(coins[n])
            L=L+1
        n -= 1
    return (result,L)
greedy_coins(1781)
```

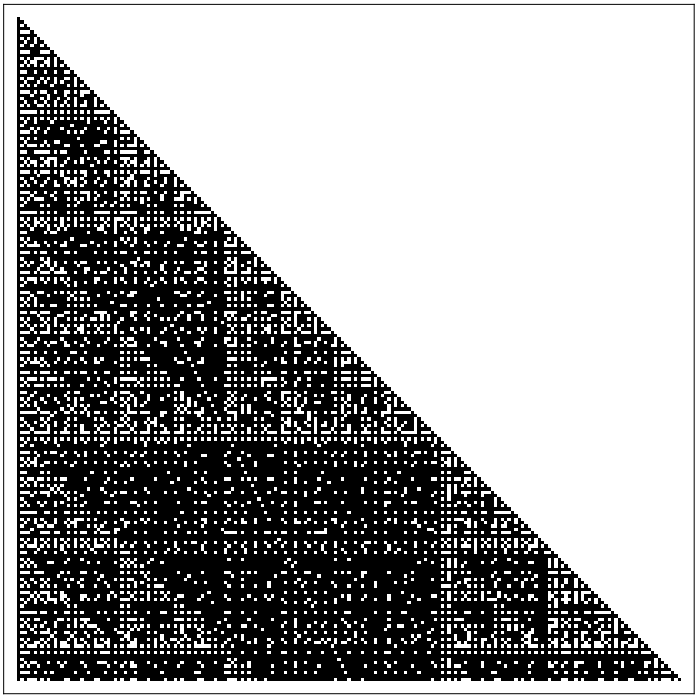
Out[8]= {{500, 500, 500, 100, 100, 50, 20, 10}, 8}

In[78]:= `f[x_] := FoldList[Times, 1 Table [(x - n) / (n + 1), {n, 1, x - 2}]]`

In[13]:= `f[7]`

In[43]:= `(Table[FoldList[Times, 1, f[n]], {n, 2, 200}] /. x_Rational → 0 /. x_Integer /; x > 1 → 1) // ArrayPlot`

Out[43]=



In[75]:=
```
Table[FoldList[Times, 1, f[n]], {n, 1, 20}] // TableForm
```

Out[75]//TableForm=

1										
1										
1	1									
1	$\frac{3}{2}$	1								
1	2	2	1							
1	$\frac{5}{2}$	$\frac{10}{3}$	$\frac{5}{2}$	1						
1	3	5	5	3	1					
1	$\frac{7}{2}$	7	$\frac{35}{4}$	7	$\frac{7}{2}$	1				
1	4	$\frac{28}{3}$	14	14	$\frac{28}{3}$	4	1			
1	$\frac{9}{2}$	12	21	$\frac{126}{5}$	21	12	$\frac{9}{2}$	1		
1	5	15	30	42	42	30	15	5	1	
1	$\frac{11}{2}$	$\frac{55}{3}$	$\frac{165}{4}$	66	77	66	$\frac{165}{4}$	$\frac{55}{3}$	$\frac{11}{2}$	1
1	6	22	55	99	132	132	99	55	22	6	1
1	$\frac{13}{2}$	26	$\frac{143}{2}$	143	$\frac{429}{2}$	$\frac{1716}{7}$	$\frac{429}{2}$	143	$\frac{143}{2}$	26	$\frac{13}{2}$
1	7	$\frac{91}{3}$	91	$\frac{1001}{5}$	$\frac{1001}{3}$	429	429	$\frac{1001}{3}$	$\frac{1001}{5}$	91	$\frac{91}{3}$
1	$\frac{15}{2}$	35	$\frac{455}{4}$	273	$\frac{1001}{2}$	715	$\frac{6435}{8}$	715	$\frac{1001}{2}$	273	$\frac{455}{4}$
1	8	40	140	364	728	1144	1430	1430	1144	728	364
1	$\frac{17}{2}$	$\frac{136}{3}$	170	476	$\frac{3094}{3}$	1768	2431	$\frac{24\,310}{9}$	2431	1768	$\frac{3094}{3}$
1	9	51	204	612	1428	2652	3978	4862	4862	3978	2652
1	$\frac{19}{2}$	57	$\frac{969}{4}$	$\frac{3876}{5}$	1938	3876	$\frac{12\,597}{2}$	8398	$\frac{46\,189}{5}$	8398	$\frac{12\,597}{2}$

In[74]:=
```
Table[FoldList[Times, 1, Table[(m - n) / (n), {n, 1, m - 1}]], {m, 1, 20}] //
 Column[#, Center] &
```

Out[74]=
```
{1}
{1, 1}
{1, 2, 1}
{1, 3, 3, 1}
{1, 4, 6, 4, 1}
{1, 5, 10, 10, 5, 1}
{1, 6, 15, 20, 15, 6, 1}
{1, 7, 21, 35, 35, 21, 7, 1}
{1, 8, 28, 56, 70, 56, 28, 8, 1}
{1, 9, 36, 84, 126, 126, 84, 36, 9, 1}
{1, 10, 45, 120, 210, 252, 210, 120, 45, 10, 1}
{1, 11, 55, 165, 330, 462, 462, 330, 165, 55, 11, 1}
{1, 12, 66, 220, 495, 792, 924, 792, 495, 220, 66, 12, 1}
{1, 13, 78, 286, 715, 1287, 1716, 1716, 1287, 715, 286, 78, 13, 1}
{1, 14, 91, 364, 1001, 2002, 3003, 3432, 3003, 2002, 1001, 364, 91, 14, 1}
{1, 15, 105, 455, 1365, 3003, 5005, 6435, 6435, 5005, 3003, 1365, 455, 105, 15, 1}
{1, 16, 120, 560, 1820, 4368, 8008, 11 440, 12 870, 11 440, 8008, 4368, 1820, 560, 120, 16, 1}
{1, 17, 136, 680, 2380, 6188, 12 376, 19 448,
 24 310, 24 310, 19 448, 12 376, 6188, 2380, 680, 136, 17, 1}
{1, 18, 153, 816, 3060, 8568, 18 564, 31 824, 43 758,
 48 620, 43 758, 31 824, 18 564, 8568, 3060, 816, 153, 18, 1}
{1, 19, 171, 969, 3876, 11 628, 27 132, 50 388, 75 582,
 92 378, 92 378, 75 582, 50 388, 27 132, 11 628, 3876, 969, 171, 19, 1}
```

In[84]:=
```
{1, 13, 78, 286, 715, 1287, 1716, 1716, 1287, 715, 286, 78, 13, 1} / 13
```

Out[84]= $\left\{\frac{1}{13}, 1, 6, 22, 55, 99, 132, 132, 99, 55, 22, 6, 1, \frac{1}{13}\right\}$