1. The number of odd coefficient in an expansion

The function considers two cases: when n is odd and when n is even. The naive way.

```
lb[n_] := Module[{obc = {}, ebc = {}}, If[EvenQ[n],

   For[i = 0, i < (n/2) + 1, i++,
    If[OddQ[Binomial[n, i]],
     AppendTo[obc, Binomial[n, i]], AppendTo[ebc, Binomial[n, i]]]
   ],
   For[k = 0, k < (n + 1)/2, k++,
    If[OddQ[Binomial[n, k]],
     AppendTo[obc, Binomial[n, k]], AppendTo[ebc, Binomial[n, k]]]
   ]
  ];
  num = {{"Odd:" Length[obc]}, {"Even:" Length[ebc]}}
  (*Index 1 holds number of distinct odd coefficients,
  Index 2 holds number of distinct even coefficients*)
 ]
```

Another way of finding the odd numbers in the expansion (x + y)^n. When I understood Tables and the Count functions.

```
lb1[n_] := Module[{i},
   l = Count[Table[Binomial[n, i], {i, 0, n}] // OddQ, True]/2;
   Print["The distinct odd number(s) with n = ", n , " is/are:   ", l]
  ];
```

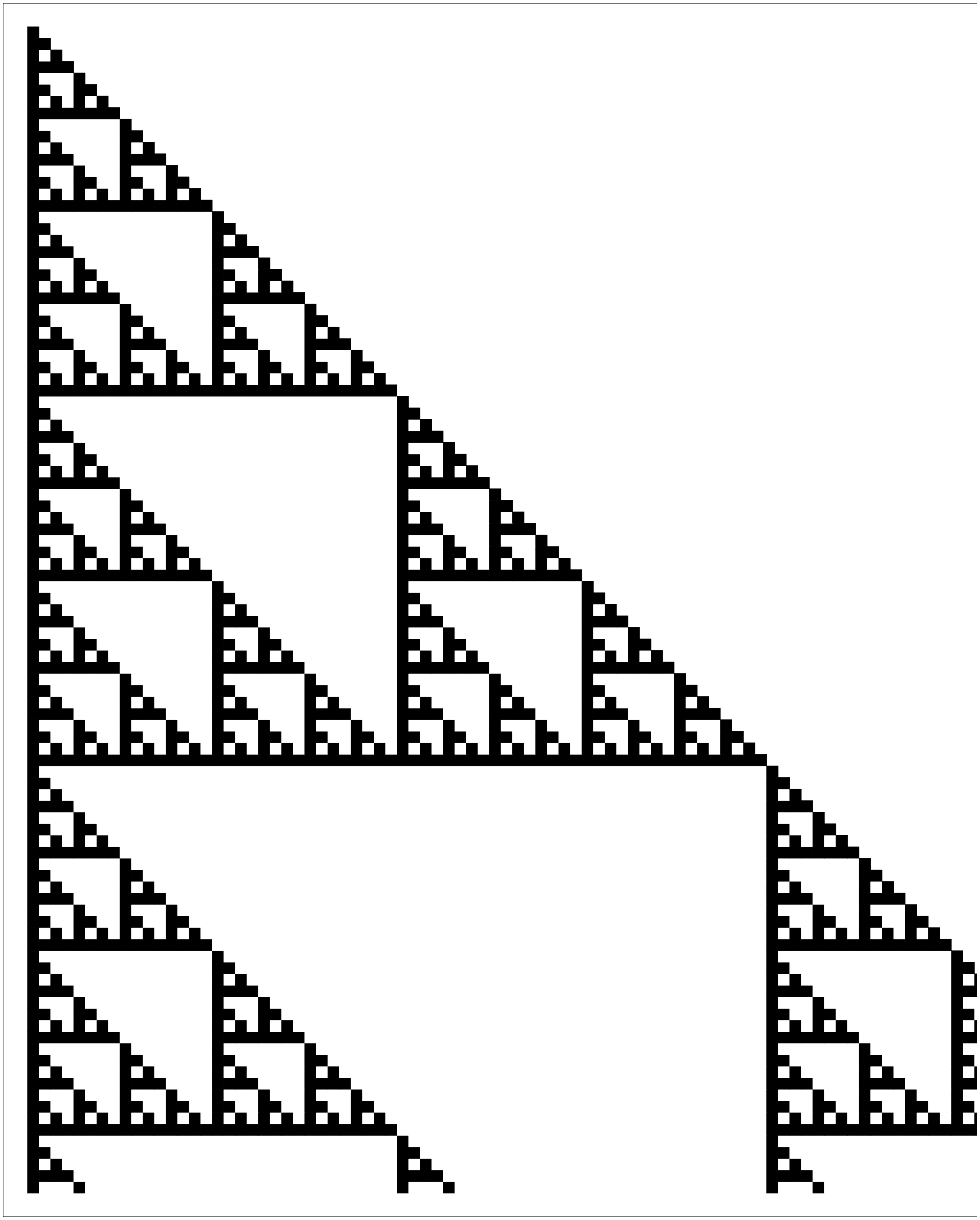
```
lb1[10000]
```

```
The distinct odd number(s) with n = 10000 is/are:   16
```

```
? ArrayPlot
```

```
ArrayPlot[array] generates a plot in which the
   values in an array are shown in a discrete array of squares.  >>
```

```
ArrayPlot[Table[
  Mod[Binomial[n, k], 2],
  {n, 0, 100}, {k, 0, n}]]
```



? Mod

Mod[m, n] gives the remainder on division of m by n.
Mod[m, n, d] uses an offset d. >>