

Pensieve header: Solving Quiz 1 on the computer.

```

sl[1] = {"", "1"}; (* "sl" for "subsets list" *)
sl[n_] := sl[n] = Join[
  sl[n-1],
  {#<>ToString[n] & /@ Reverse[sl[n-1]]}
]

sl[1] /. "" -> "∅"
{∅, 1}

sl[2] /. "" -> "∅"
{∅, 1, 12, 2}

sl[3] /. "" -> "∅"
{∅, 1, 12, 2, 23, 123, 13, 3}

sl[4] /. "" -> "∅"
{∅, 1, 12, 2, 23, 123, 13, 3, 34, 134, 1234, 234, 24, 124, 14, 4}

sl[5] /. "" -> "∅"
{∅, 1, 12, 2, 23, 123, 13, 3, 34, 134, 1234, 234, 24, 124, 14, 4, 45, 145,
  1245, 245, 2345, 12345, 1345, 345, 35, 135, 1235, 235, 25, 125, 15, 5}

```

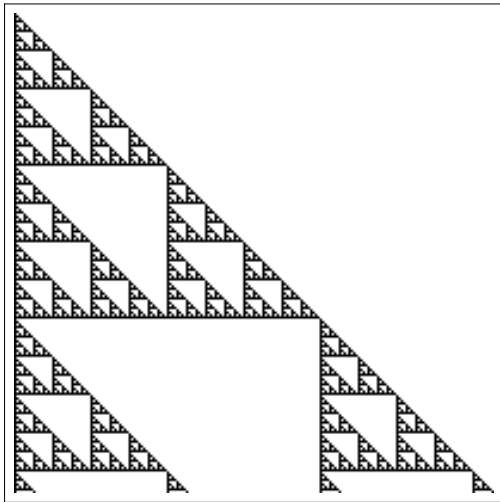
```

bp[n_, 0] = bp[n_, n_] = 1; (* "bp" for "binary pascal" *)
bp[n_, k_] := bp[n, k] = (bp[n-1, k-1] + bp[n-1, k]) /. 2 -> 0
Sum[bp[1000, k], {k, 0, 1000}]

```

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ArrayPlot[  
  Table[bp[n, k], {n, 0, 200}, {k, 0, n}]  
]
```



```
S[0] = 1;  
S[n_] := 2 * S[n - 2Floor[Log[2, n]]];  
S[1000]
```

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