

Worksheet 24

For Loops and Counting

Consider placing one grain of sand on the first square and then doubling it for the second square and so on until you have filled all 64 squares. That's a lot of sand on a checker board!

Write a Java main program to display how many grains of sand would be on every square of the checker board.

On the last line of your chart, i.e., after the 64th square's count;

display the sum of all of the grains of sand on the entire checkboard.

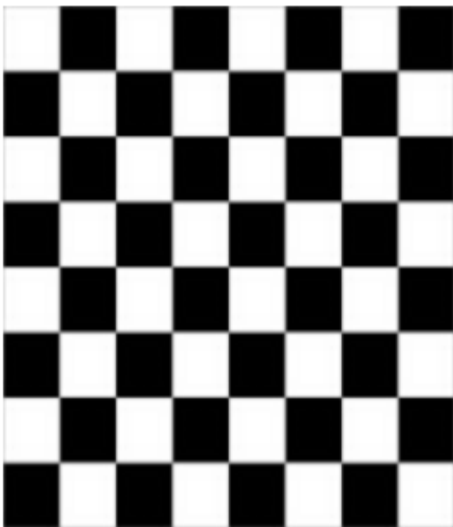


Figure 1 – A Checkerboard

This is an incomplete Sample Session.... Make your session go all the way to square 64 and then include an additional line showing the SUM of all of the grains of sand that are on the entire checker board.

```
square# 1 has 1 grains. Total: 1
square# 2 has 2 grains. Total: 3
square# 3 has 4 grains. Total: 7
square# 4 has 8 grains. Total: 15
square# 5 has 16 grains. Total: 31
square# 6 has 32 grains. Total: 63
square# 7 has 64 grains. Total: 127
square# 8 has 128 grains. Total: 255
square# 9 has 256 grains. Total: 511
square# 10 has 512 grains. Total: 1023
square# 11 has 1024 grains. Total: 2047
square# 12 has 2048 grains. Total: 4095
square# 13 has 4096 grains. Total: 8191
square# 14 has 8192 grains. Total: 16383
square# 15 has 16384 grains. Total: 32767
square# 16 has 32768 grains. Total: 65535
square# 17 has 65536 grains. Total: 131071
square# 18 has 131072 grains. Total: 262143
square# 19 has 262144 grains. Total: 524287
square# 20 has 524288 grains. Total: 1048575
square# 21 has 1048576 grains. Total: 2097151
square# 22 has 2097152 grains. Total: 4194303
square# 23 has 4194304 grains. Total: 8388607
square# 24 has 8388608 grains. Total: 16777215
square# 25 has 16777216 grains. Total: 33554431
square# 26 has 33554432 grains. Total: 67108863
square# 27 has 67108864 grains. Total: 134217727
square# 28 has 134217728 grains. Total: 268435455
square# 29 has 268435456 grains. Total: 536870911
square# 30 has 536870912 grains. Total: 1073741823
square# 31 has 1073741824 grains. Total: 2147483647
square# 32 has 2147483648 grains. Total: 4294967295
square# 33 has 4294967296 grains. Total: 8589934591
square# 34 has 8589934592 grains. Total: 17179869183
square# 35 has 17179869184 grains. Total: 34359738367
square# 36 has 34359738368 grains. Total: 68719476735
square# 37 has 68719476736 grains. Total: 137438953471
square# 38 has 137438953472 grains. Total: 274877906943
square# 39 has 274877906944 grains. Total: 549755813887
square# 40 has 549755813888 grains. Total: 1099511627775
square# 41 has 1099511627776 grains. Total: 2199023255551
square# 42 has 2199023255552 grains. Total: 4398046511103
square# 43 has 4398046511104 grains. Total: 8796093022207
```