

## ACTIVITY 2 – Elements of Programming (Part 2)

### 1. Print the first 50 power of $2^N$

R= changed the data type of the variable “powerOfTwo” to long to avoid to overflow the max range of the original type INT

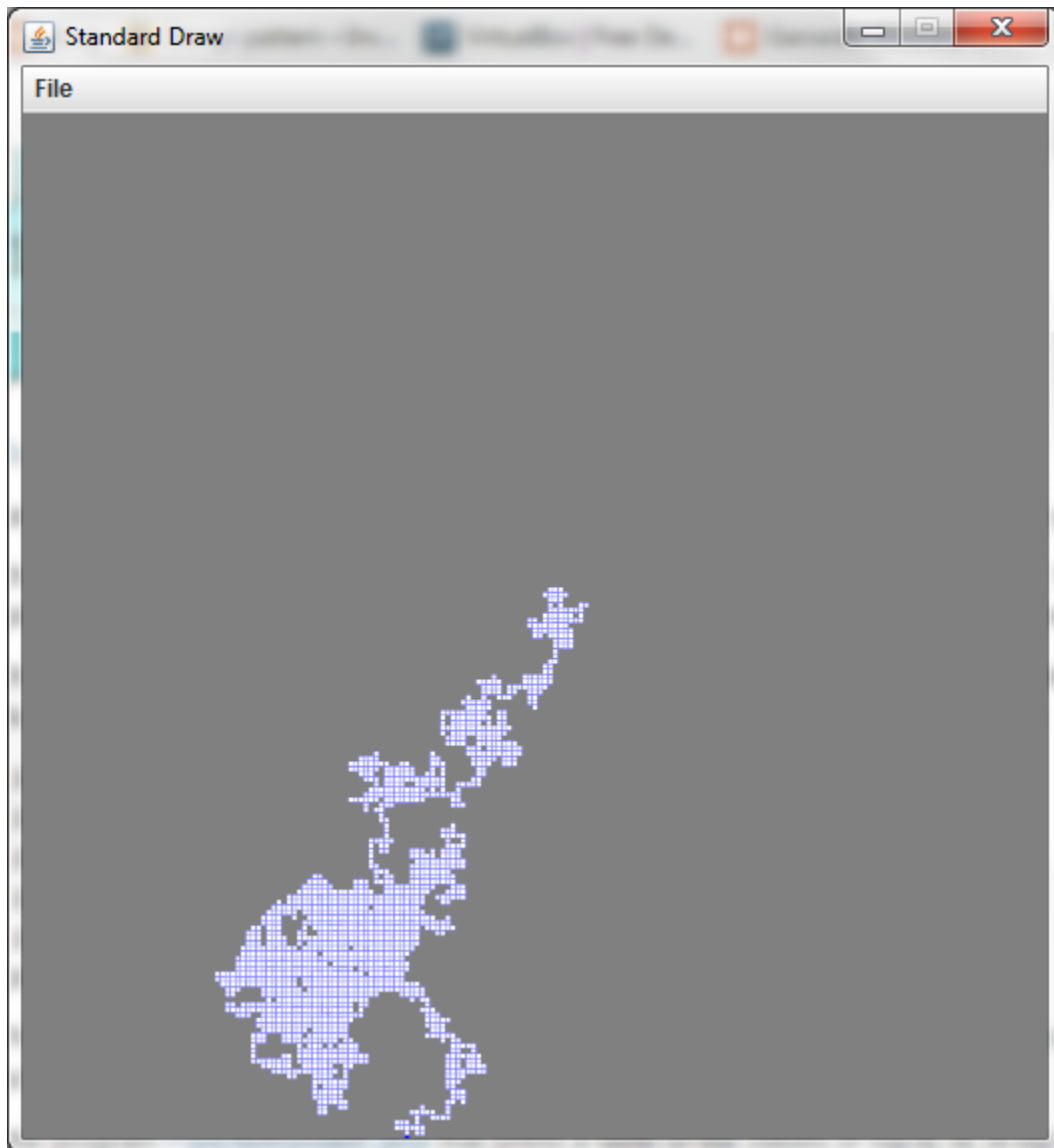
OUTPUT RESULT:

```
0 1
1 2
2 4
3 8
4 16
5 32
6 64
7 128
8 256
9 512
10 1024
11 2048
12 4096
13 8192
14 16384
15 32768
16 65536
17 131072
18 262144
19 524288
20 1048576
21 2097152
22 4194304
23 8388608
24 16777216
25 33554432
26 67108864
27 134217728
28 268435456
29 536870912
30 1073741824
31 2147483648
32 4294967296
33 8589934592
34 17179869184
35 34359738368
36 68719476736
37 137438953472
38 274877906944
39 549755813888
40 1099511627776
41 2199023255552
42 4398046511104
43 8796093022208
```

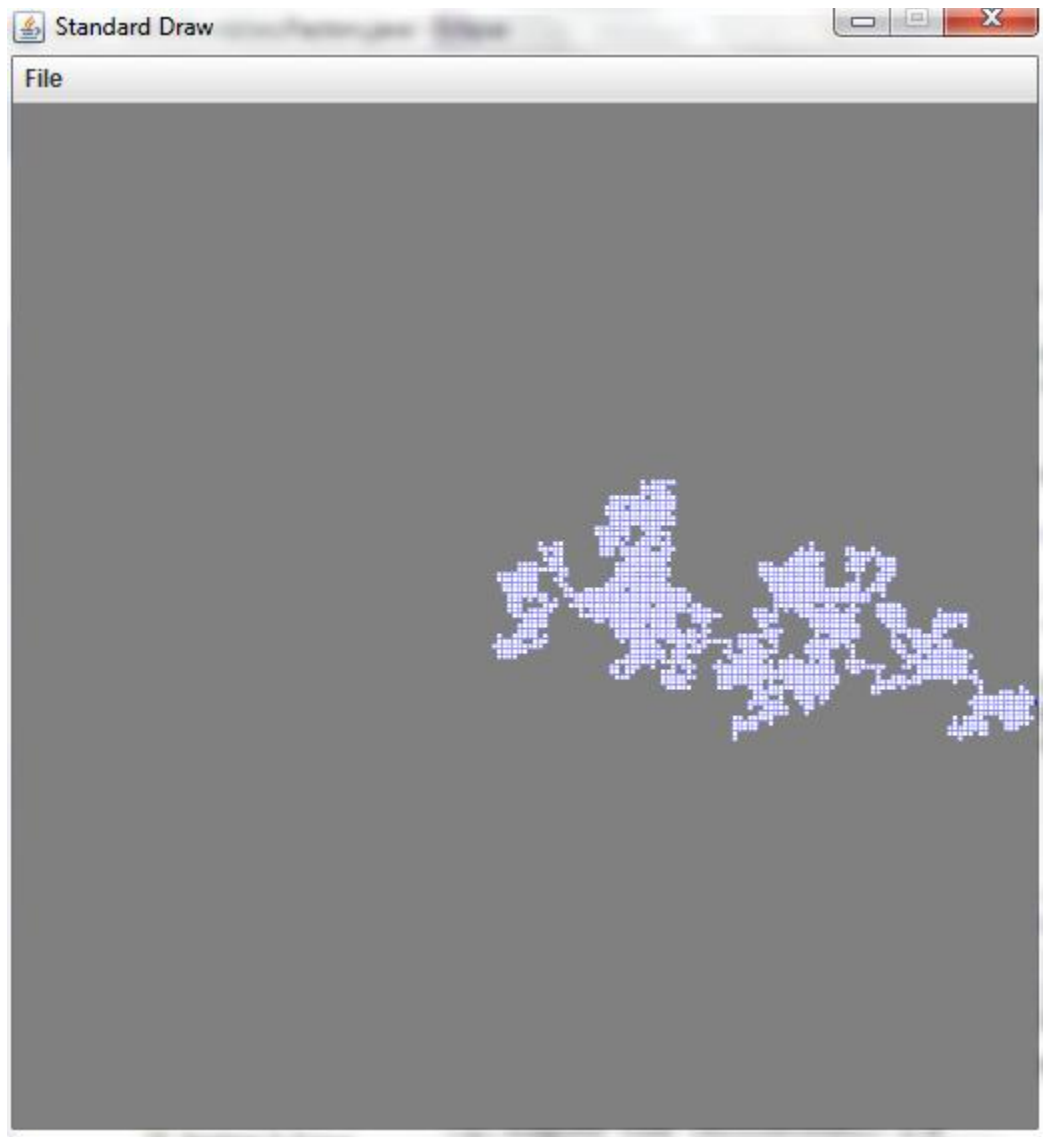
```
44 17592186044416
45 35184372088832
46 70368744177664
47 140737488355328
48 281474976710656
49 562949953421312
50 1125899906842624
```

## 2. RandomWalk.java

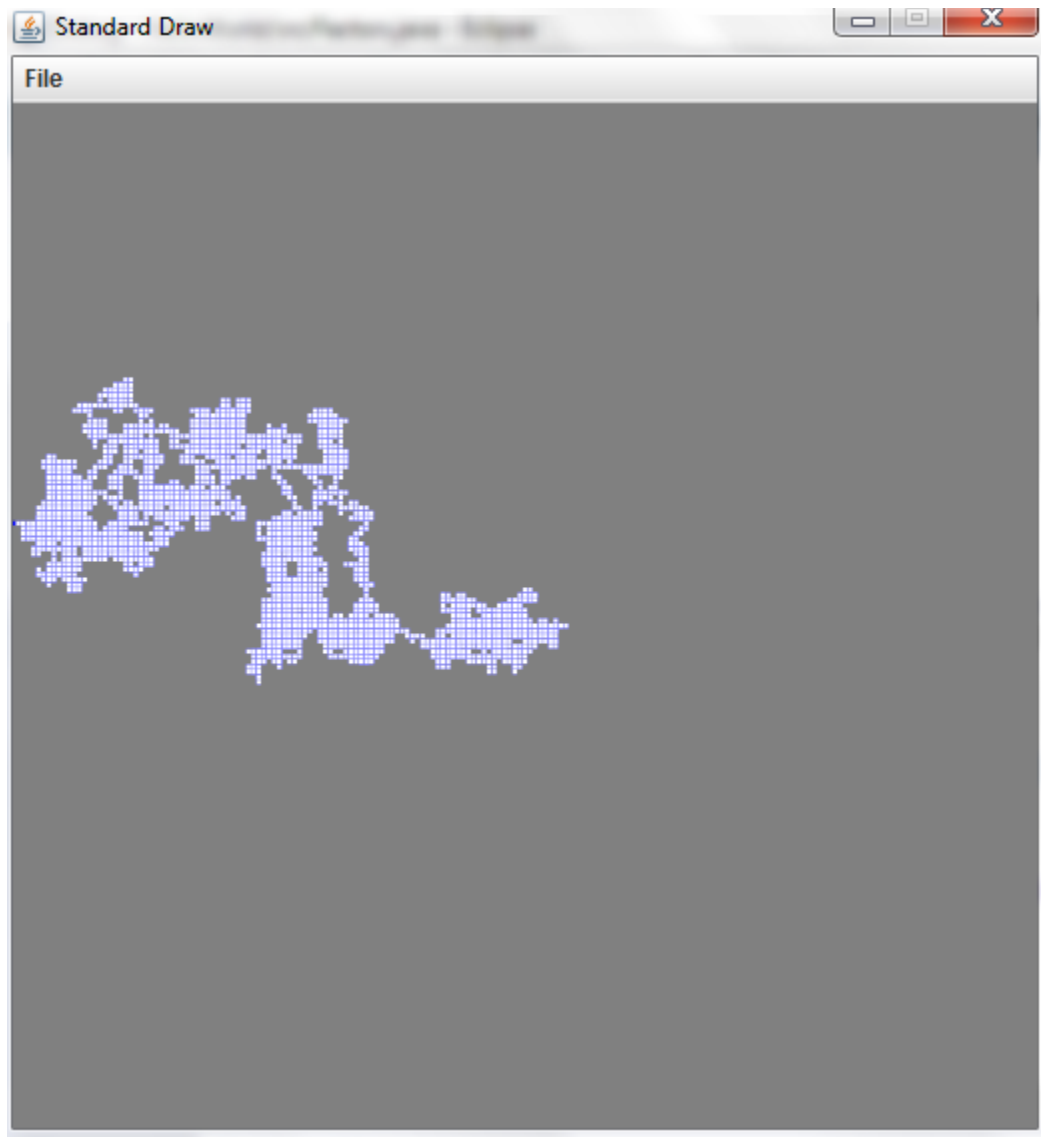
OUTPUT 1:



OUTPUT 2:



OUTPUT 3:



### 3. Factors

#### OUTPUT RESULTS:

The prime factorization of 997 is: 997

Elapsed time (milliseconds): 1.0

The prime factorization of 999983 is: 999983

Elapsed time (milliseconds): 1.0

The prime factorization of 999999937 is: 999999937

Elapsed time (milliseconds): 2.0

The prime factorization of 99999999989 is: 99999999989

Elapsed time (milliseconds): 14.0

The prime factorization of 9999999999989 is: 9999999999989

Elapsed time (milliseconds): 327.0

The prime factorization of 999999999999989 is: 999999999999989

Elapsed time (milliseconds): 10261.0

### 4. FunctionGrowth

#### OUTPUT RESULT:

log N	N	N log N	N^2	N^3
0.6931472	2.0	1.3862944	4.0	8.0
1.3862944	4.0	5.5451775	16.0	64.0
2.0794415	8.0	16.635532	64.0	512.0
2.7725887	16.0	44.36142	256.0	4096.0
3.465736	32.0	110.90355	1024.0	32768.0
4.158883	64.0	266.16852	4096.0	262144.0
4.8520303	128.0	621.0599	16384.0	2097152.0
5.5451775	256.0	1419.5654	65536.0	1.6777216E7
6.2383246	512.0	3194.0222	262144.0	1.34217728E8
6.931472	1024.0	7097.827	1048576.0	1.07374182E9
7.624619	2048.0	15615.22	4194304.0	8.5899346E9
8.317766	4096.0	34069.57	1.6777216E7	6.8719477E10
9.010913	8192.0	73817.4	6.7108864E7	5.4975581E11
9.704061	16384.0	158991.33	2.68435456E8	4.3980465E12
10.397207	32768.0	340695.7	1.07374182E9	3.5184372E13
11.090355	65536.0	726817.5	4.2949673E9	2.81474977E14
11.783502	131072.0	1544487.1	1.71798692E10	2.25179981E15
12.476649	262144.0	3270678.8	6.8719477E10	1.80143985E16
13.169796	524288.0	6904766.0	2.74877907E11	1.44115188E17
13.862944	1048576.0	1.453635E7	1.09951163E12	1.1529215E18
14.55609	2097152.0	3.0526334E7	4.3980465E12	9.223372E18
15.249238	4194304.0	6.395994E7	1.7592186E13	7.3786976E19
15.942385	8388608.0	1.33734416E8	7.0368744E13	5.902958E20
16.635532	1.6777216E7	2.7909792E8	2.81474977E14	4.7223665E21
17.32868	3.3554432E7	5.8145402E8	1.12589991E15	3.7778932E22
18.021826	6.7108864E7	1.20942426E9	4.5035996E15	3.0223145E23
18.714973	1.34217728E8	2.51188122E9	1.80143985E16	2.4178516E24

19.408121	2.68435456E8	5.2098278E9	7.2057594E16	1.9342813E25
20.101269	5.3687091E8	1.07917865E10	2.88230376E17	1.54742505E26
20.794415	1.07374182E9	2.23278326E10	1.1529215E18	1.23794004E27

## 5. First 256 num in HEX

OUTPUT RESULT:

Number 1 to hexadecimal: 1  
Number 2 to hexadecimal: 2  
Number 3 to hexadecimal: 3  
Number 4 to hexadecimal: 4  
Number 5 to hexadecimal: 5  
Number 6 to hexadecimal: 6  
Number 7 to hexadecimal: 7  
Number 8 to hexadecimal: 8  
Number 9 to hexadecimal: 9  
Number 10 to hexadecimal: A  
Number 11 to hexadecimal: B  
Number 12 to hexadecimal: C  
Number 13 to hexadecimal: D  
Number 14 to hexadecimal: E  
Number 15 to hexadecimal: F  
Number 16 to hexadecimal: 10  
Number 17 to hexadecimal: 11  
Number 18 to hexadecimal: 12  
Number 19 to hexadecimal: 13  
Number 20 to hexadecimal: 14  
Number 21 to hexadecimal: 15  
Number 22 to hexadecimal: 16  
Number 23 to hexadecimal: 17  
Number 24 to hexadecimal: 18  
Number 25 to hexadecimal: 19  
Number 26 to hexadecimal: 1A  
Number 27 to hexadecimal: 1B  
Number 28 to hexadecimal: 1C  
Number 29 to hexadecimal: 1D  
Number 30 to hexadecimal: 1E  
Number 31 to hexadecimal: 1F  
Number 32 to hexadecimal: 20  
Number 33 to hexadecimal: 21  
Number 34 to hexadecimal: 22  
Number 35 to hexadecimal: 23  
Number 36 to hexadecimal: 24  
Number 37 to hexadecimal: 25  
Number 38 to hexadecimal: 26  
Number 39 to hexadecimal: 27  
Number 40 to hexadecimal: 28  
Number 41 to hexadecimal: 29  
Number 42 to hexadecimal: 2A  
Number 43 to hexadecimal: 2B  
Number 44 to hexadecimal: 2C  
Number 45 to hexadecimal: 2D  
Number 46 to hexadecimal: 2E

Number 47 to hexadecimal: 2F  
Number 48 to hexadecimal: 30  
Number 49 to hexadecimal: 31  
Number 50 to hexadecimal: 32  
Number 51 to hexadecimal: 33  
Number 52 to hexadecimal: 34  
Number 53 to hexadecimal: 35  
Number 54 to hexadecimal: 36  
Number 55 to hexadecimal: 37  
Number 56 to hexadecimal: 38  
Number 57 to hexadecimal: 39  
Number 58 to hexadecimal: 3A  
Number 59 to hexadecimal: 3B  
Number 60 to hexadecimal: 3C  
Number 61 to hexadecimal: 3D  
Number 62 to hexadecimal: 3E  
Number 63 to hexadecimal: 3F  
Number 64 to hexadecimal: 40  
Number 65 to hexadecimal: 41  
Number 66 to hexadecimal: 42  
Number 67 to hexadecimal: 43  
Number 68 to hexadecimal: 44  
Number 69 to hexadecimal: 45  
Number 70 to hexadecimal: 46  
Number 71 to hexadecimal: 47  
Number 72 to hexadecimal: 48  
Number 73 to hexadecimal: 49  
Number 74 to hexadecimal: 4A  
Number 75 to hexadecimal: 4B  
Number 76 to hexadecimal: 4C  
Number 77 to hexadecimal: 4D  
Number 78 to hexadecimal: 4E  
Number 79 to hexadecimal: 4F  
Number 80 to hexadecimal: 50  
Number 81 to hexadecimal: 51  
Number 82 to hexadecimal: 52  
Number 83 to hexadecimal: 53  
Number 84 to hexadecimal: 54  
Number 85 to hexadecimal: 55  
Number 86 to hexadecimal: 56  
Number 87 to hexadecimal: 57  
Number 88 to hexadecimal: 58  
Number 89 to hexadecimal: 59  
Number 90 to hexadecimal: 5A  
Number 91 to hexadecimal: 5B  
Number 92 to hexadecimal: 5C  
Number 93 to hexadecimal: 5D  
Number 94 to hexadecimal: 5E  
Number 95 to hexadecimal: 5F  
Number 96 to hexadecimal: 60  
Number 97 to hexadecimal: 61  
Number 98 to hexadecimal: 62  
Number 99 to hexadecimal: 63  
Number 100 to hexadecimal: 64  
Number 101 to hexadecimal: 65

Number 102 to hexadecimal: 66  
Number 103 to hexadecimal: 67  
Number 104 to hexadecimal: 68  
Number 105 to hexadecimal: 69  
Number 106 to hexadecimal: 6A  
Number 107 to hexadecimal: 6B  
Number 108 to hexadecimal: 6C  
Number 109 to hexadecimal: 6D  
Number 110 to hexadecimal: 6E  
Number 111 to hexadecimal: 6F  
Number 112 to hexadecimal: 70  
Number 113 to hexadecimal: 71  
Number 114 to hexadecimal: 72  
Number 115 to hexadecimal: 73  
Number 116 to hexadecimal: 74  
Number 117 to hexadecimal: 75  
Number 118 to hexadecimal: 76  
Number 119 to hexadecimal: 77  
Number 120 to hexadecimal: 78  
Number 121 to hexadecimal: 79  
Number 122 to hexadecimal: 7A  
Number 123 to hexadecimal: 7B  
Number 124 to hexadecimal: 7C  
Number 125 to hexadecimal: 7D  
Number 126 to hexadecimal: 7E  
Number 127 to hexadecimal: 7F  
Number 128 to hexadecimal: 80  
Number 129 to hexadecimal: 81  
Number 130 to hexadecimal: 82  
Number 131 to hexadecimal: 83  
Number 132 to hexadecimal: 84  
Number 133 to hexadecimal: 85  
Number 134 to hexadecimal: 86  
Number 135 to hexadecimal: 87  
Number 136 to hexadecimal: 88  
Number 137 to hexadecimal: 89  
Number 138 to hexadecimal: 8A  
Number 139 to hexadecimal: 8B  
Number 140 to hexadecimal: 8C  
Number 141 to hexadecimal: 8D  
Number 142 to hexadecimal: 8E  
Number 143 to hexadecimal: 8F  
Number 144 to hexadecimal: 90  
Number 145 to hexadecimal: 91  
Number 146 to hexadecimal: 92  
Number 147 to hexadecimal: 93  
Number 148 to hexadecimal: 94  
Number 149 to hexadecimal: 95  
Number 150 to hexadecimal: 96  
Number 151 to hexadecimal: 97  
Number 152 to hexadecimal: 98  
Number 153 to hexadecimal: 99  
Number 154 to hexadecimal: 9A  
Number 155 to hexadecimal: 9B  
Number 156 to hexadecimal: 9C



Number 157 to hexadecimal: 9D  
Number 158 to hexadecimal: 9E  
Number 159 to hexadecimal: 9F  
Number 160 to hexadecimal: A0  
Number 161 to hexadecimal: A1  
Number 162 to hexadecimal: A2  
Number 163 to hexadecimal: A3  
Number 164 to hexadecimal: A4  
Number 165 to hexadecimal: A5  
Number 166 to hexadecimal: A6  
Number 167 to hexadecimal: A7  
Number 168 to hexadecimal: A8  
Number 169 to hexadecimal: A9  
Number 170 to hexadecimal: AA  
Number 171 to hexadecimal: AB  
Number 172 to hexadecimal: AC  
Number 173 to hexadecimal: AD  
Number 174 to hexadecimal: AE  
Number 175 to hexadecimal: AF  
Number 176 to hexadecimal: B0  
Number 177 to hexadecimal: B1  
Number 178 to hexadecimal: B2  
Number 179 to hexadecimal: B3  
Number 180 to hexadecimal: B4  
Number 181 to hexadecimal: B5  
Number 182 to hexadecimal: B6  
Number 183 to hexadecimal: B7  
Number 184 to hexadecimal: B8  
Number 185 to hexadecimal: B9  
Number 186 to hexadecimal: BA  
Number 187 to hexadecimal: BB  
Number 188 to hexadecimal: BC  
Number 189 to hexadecimal: BD  
Number 190 to hexadecimal: BE  
Number 191 to hexadecimal: BF  
Number 192 to hexadecimal: C0  
Number 193 to hexadecimal: C1  
Number 194 to hexadecimal: C2  
Number 195 to hexadecimal: C3  
Number 196 to hexadecimal: C4  
Number 197 to hexadecimal: C5  
Number 198 to hexadecimal: C6  
Number 199 to hexadecimal: C7  
Number 200 to hexadecimal: C8  
Number 201 to hexadecimal: C9  
Number 202 to hexadecimal: CA  
Number 203 to hexadecimal: CB  
Number 204 to hexadecimal: CC  
Number 205 to hexadecimal: CD  
Number 206 to hexadecimal: CE  
Number 207 to hexadecimal: CF  
Number 208 to hexadecimal: D0  
Number 209 to hexadecimal: D1  
Number 210 to hexadecimal: D2  
Number 211 to hexadecimal: D3

Number 212 to hexadecimal: D4  
Number 213 to hexadecimal: D5  
Number 214 to hexadecimal: D6  
Number 215 to hexadecimal: D7  
Number 216 to hexadecimal: D8  
Number 217 to hexadecimal: D9  
Number 218 to hexadecimal: DA  
Number 219 to hexadecimal: DB  
Number 220 to hexadecimal: DC  
Number 221 to hexadecimal: DD  
Number 222 to hexadecimal: DE  
Number 223 to hexadecimal: DF  
Number 224 to hexadecimal: E0  
Number 225 to hexadecimal: E1  
Number 226 to hexadecimal: E2  
Number 227 to hexadecimal: E3  
Number 228 to hexadecimal: E4  
Number 229 to hexadecimal: E5  
Number 230 to hexadecimal: E6  
Number 231 to hexadecimal: E7  
Number 232 to hexadecimal: E8  
Number 233 to hexadecimal: E9  
Number 234 to hexadecimal: EA  
Number 235 to hexadecimal: EB  
Number 236 to hexadecimal: EC  
Number 237 to hexadecimal: ED  
Number 238 to hexadecimal: EE  
Number 239 to hexadecimal: EF  
Number 240 to hexadecimal: F0  
Number 241 to hexadecimal: F1  
Number 242 to hexadecimal: F2  
Number 243 to hexadecimal: F3  
Number 244 to hexadecimal: F4  
Number 245 to hexadecimal: F5  
Number 246 to hexadecimal: F6  
Number 247 to hexadecimal: F7  
Number 248 to hexadecimal: F8  
Number 249 to hexadecimal: F9  
Number 250 to hexadecimal: FA  
Number 251 to hexadecimal: FB  
Number 252 to hexadecimal: FC  
Number 253 to hexadecimal: FD  
Number 254 to hexadecimal: FE  
Number 255 to hexadecimal: FF  
Number 256 to hexadecimal: 100

## **6. DayOfWeek**

OUTPUT RESULT:

Month: 17

Day: 2

Year: 1981

Day of Week: Tuesday

## **7. Deal**

RESULTS:

In 20 trials user won 7 times vs 13 of house

## **8. Average number of people (Birthday.java)**

RESULTS:

Parameter Days = 365

18  
35  
37  
53  
61  
63  
76  
79  
84  
92  
99  
101  
105  
112  
115  
118  
120  
122  
123  
130

Average number of people after 20 rounds: 87

## 9. Pascal Triangle (Pacal.java)

RESULT:

Enter parameter 11 to produce a level 10 Pascal Triangle

```
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
```

## 10. Sierpinski Triangle

RESULT:

Black Inverted Triangles # = (int) Math.pow(3, level - 1)

Upright White Triangles # = (int) (# BlackInvertedTriangles - 1) / 2

What level do you want? 5

No. of black inverted triangles: 81

No. of upright white triangles: 40

