**Lab Assignment Factorial**

**Source Code int:**

//FactorialProg

/\* Programmer: Cole Rodenberg Date: 10/6/15\*/

public class FactorialProg

{

public static void main(String[]args)

{

System.out.println("Value of N Value of N Factorial");

System.out.println("\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_");

for(int i=10; i<=30; i++)

{

System.out.printf("%10d %20d", i, factorial(i));

System.out.println();

}

}//main

public static int factorial(int n)

{

int fact = 1;

for(int count=n; count>1; count--)

fact\*=count;

return fact;

}//factorial

}//class

**Execution/Run int:**

Value of N Value of N Factorial

\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

10 3628800

11 39916800

12 479001600

13 1932053504

14 1278945280

15 2004310016

16 2004189184

17 -288522240

18 -898433024

19 109641728

20 -2102132736

21 -1195114496

22 -522715136

23 862453760

24 -775946240

25 2076180480

26 -1853882368

27 1484783616

28 -1375731712

29 -1241513984

30 1409286144

Int will not have the correct value at 13.

**Source Code Long:**

//FactorialProg2

/\* Programmer: Cole Rodenberg Date: 10/6/15\*/

public class FactorialProg2

{

public static void main(String[]args)

{

System.out.println("Value of N Value of N Factorial");

System.out.println("\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_");

for(int i=1; i<=9; i++)

{

System.out.printf("%10d %20d", i, factorial(i));

System.out.println();

}

for(int i=10; i<=30; i++)

{

System.out.printf("%10d %20d", i, factorial(i));

System.out.println();

}

}//main

public static long factorial(int n)

{

long fact = 1;

for(int count=n; count>1; count--)

fact\*=count;

return fact;

}//factorial

}//class

**Execution/Run Long:**

Value of N Value of N Factorial

\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1 1

2 2

3 6

4 24

5 120

6 720

7 5040

8 40320

9 362880

10 3628800

11 39916800

12 479001600

13 6227020800

14 87178291200

15 1307674368000

16 20922789888000

17 355687428096000

18 6402373705728000

19 121645100408832000

20 2432902008176640000

21 -4249290049419214848

22 -1250660718674968576

23 8128291617894825984

24 -7835185981329244160

25 7034535277573963776

26 -1569523520172457984

27 -5483646897237262336

28 -5968160532966932480

29 -7055958792655077376

30 -8764578968847253504

Long will not have the correct value at 21.

**Source Code Double:**

//FactorialProg3

/\* Programmer: Cole Rodenberg Date: 10/6/15\*/

public class FactorialProg3

{

public static void main(String[]args)

{

System.out.println("Value of N Value of N Factorial");

System.out.println("\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_");

for(int i=10; i<=175; i+=5)

{

System.out.printf("%10d %20.7e", i, factorial(i));

System.out.println();

}

}//main

public static double factorial(int n)

{

double fact = 1;

for(int count=n; count>1; count--)

fact\*=count;

return fact;

}//factorial

}//class

**Execution/Run C:**

Value of N Value of N Factorial

\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

10 3.6288000e+06

15 1.3076744e+12

20 2.4329020e+18

25 1.5511210e+25

30 2.6525286e+32

35 1.0333148e+40

40 8.1591528e+47

45 1.1962222e+56

50 3.0414093e+64

55 1.2696403e+73

60 8.3209871e+81

65 8.2476506e+90

70 1.1978572e+100

75 2.4809141e+109

80 7.1569457e+118

85 2.8171041e+128

90 1.4857160e+138

95 1.0329978e+148

100 9.3326215e+157

105 1.0813968e+168

110 1.5882455e+178

115 2.9250937e+188

120 6.6895029e+198

125 1.8826772e+209

130 6.4668555e+219

135 2.6904727e+230

140 1.3462012e+241

145 8.0479261e+251

150 5.7133840e+262

155 4.7891429e+273

160 4.7147236e+284

165 5.4239107e+295

170 7.2574156e+306

175 Infinity

Double will mess up at 171.

**Source Code Recursion:**

//FactorialR

/\* Programmer: Cole Rodenberg Date: 2/23/16\*/

public class FactorialR

{

public static void main(String[]args)

{

System.out.println("Value of N Value of N Factorial");

System.out.println("\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_");

for(int i=10; i<=175; i+=5)

{

System.out.printf("%10d %20.7e", i, factorial(i));

System.out.println();

}

}//main

public static double factorial(int n)

{

if (n == 1)

return 1;

return n \* factorial(n-1);

}//factorial

}//class

**Compile/Execution Recursion:**

W:\ComputerProgramming>javac FactorialR.java

W:\ComputerProgramming>java FactorialR

Value of N Value of N Factorial

\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

10 3.6288000e+06

15 1.3076744e+12

20 2.4329020e+18

25 1.5511210e+25

30 2.6525286e+32

35 1.0333148e+40

40 8.1591528e+47

45 1.1962222e+56

50 3.0414093e+64

55 1.2696403e+73

60 8.3209871e+81

65 8.2476506e+90

70 1.1978572e+100

75 2.4809141e+109

80 7.1569457e+118

85 2.8171041e+128

90 1.4857160e+138

95 1.0329978e+148

100 9.3326215e+157

105 1.0813968e+168

110 1.5882455e+178

115 2.9250937e+188

120 6.6895029e+198

125 1.8826772e+209

130 6.4668555e+219

135 2.6904727e+230

140 1.3462012e+241

145 8.0479261e+251

150 5.7133840e+262

155 4.7891429e+273

160 4.7147236e+284

165 5.4239107e+295

170 7.2574156e+306

175 Infinity