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EXPERIMENT:	1a
BATCH:	A3
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Aim: To implement the various functions e.g. linear, non-linear, quadratic, exponential etc.

Code:

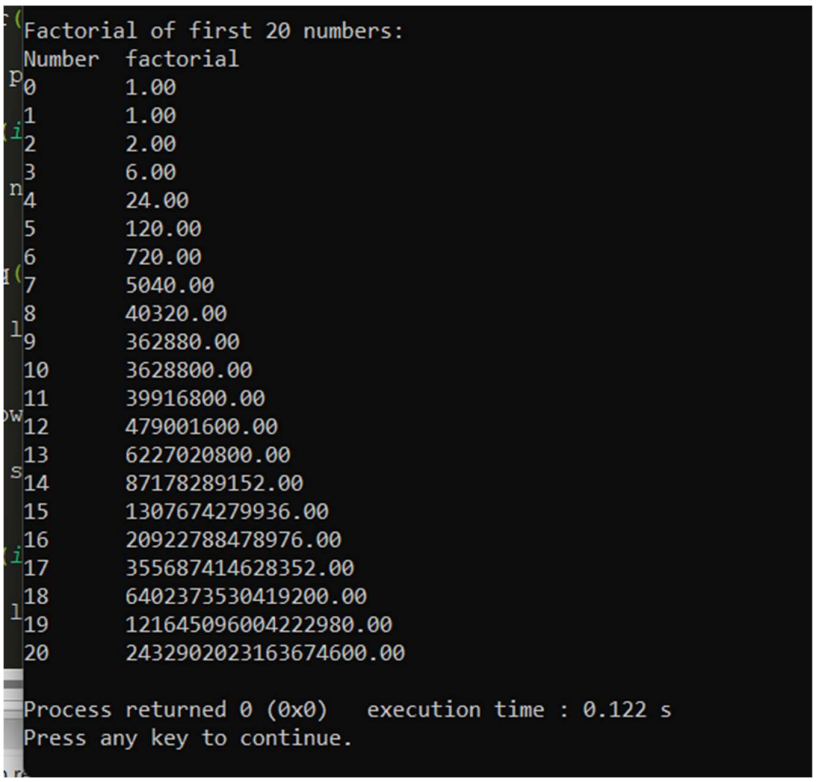
```
#include <stdio.h>
float power(int n)
{
   return pow(1.5, n);
}
float cube(int n)
{
   return n * n * n;
}

float logsq(int n)
{
   return log(n) * log(n);
}

float powpow(int n)
{
   return sqrt(log(n));
}

float loga(int n)
{
   return log(n);
}

float func(int n)
{
   return n * pow(2, n);
```

```
}

float logdiv(int n)
{
   return (log(n) / log(2.718));
}

float loga2(int n)
{
   return log(log(n));
}

float expo(int n)
{
   return exp(n);
}

float pown(int n)
{
   return pow(2, n);
}
float fact(int n)
{
   float ans = 1.0;
   for (int i = 1; i <= n; i++)
   {
      ans = ans * i;
   }
   return ans;
}

int main()
{
   printf("Number\t(3/2)^n\tn^3\t(lg n)^2\tsqrt(log n)\tlog n\tn*2^n\tln
n\tlog(log n)\te^n\t2^n\n");
   for (int i = 0; i <= 100; i++)
   {

printf("%d\t%.2f\t%.2f\t%.2f\t%.2f\t%.2f\t%.2f\t%.2f\t%.2f\t%.2f\t%.2f\t%.2f\n", i,
```

```
power(i), cube(i), logsq(i), powpow(i), loga(i), func(i), logdiv(i), loga2(i), expo(i),
pown(i));
   }
   printf("\nFactorial of first 20 numbers:\n");
   printf("Number\tfactorial\n");
   for (int i = 0; i <= 20; i++)
   {
      printf("%d\t%.2f\n", i, fact(i));
   }
   return 0;
}
```

Output:

```
C:\Users\Neha\Desktop\GitHub\DAA\exp1.exe
Number  (3/2)^n n^3     (lg n)^2        sqrt(log n)     log n   n*2^n   ln n    log(log n)      e^n     2^n
0       1.00    0.00    1.#J    -1.#J   -1.#J   0.00    -1.#J   1.#R    1.00    1.00
1       1.50    1.00    0.00    0.00    0.00    2.00    0.00    -1.#J   2.72    2.00
2       2.25    8.00    0.48    0.83    0.69    8.00    0.69    -0.37   7.39    4.00
3       3.38    27.00   1.21    1.05    1.10    24.00   1.10    0.09    20.09   8.00
4       5.06    64.00   1.92    1.18    1.39    64.00   1.39    0.33    54.60   16.00
5       7.59    125.00  2.59    1.27    1.61    160.00  1.61    0.48    148.41  32.00
6       11.39   216.00  3.21    1.34    1.79    384.00  1.79    0.58    403.43  64.00
7       17.09   343.00  3.79    1.39    1.95    896.00  1.95    0.67    1096.63 128.00
8       25.63   512.00  4.32    1.44    2.08    2048.00 2.08    0.73    2980.96 256.00
9       38.44   729.00  4.83    1.48    2.20    4608.00 2.20    0.79    8103.08 512.00
10      57.67   1000.00 5.30    1.52    2.30    10240.00        2.30    0.83    22026.46        1024.00
11      86.50   1331.00 5.75    1.55    2.40    22528.00        2.40    0.87    59874.14        2048.00
12      129.75  1728.00 6.17    1.58    2.48    49152.00        2.49    0.91    162754.80       4096.00
13      194.62  2197.00 6.58    1.60    2.56    106496.00       2.57    0.94    442413.41       8192.00
14      291.93  2744.00 6.96    1.62    2.64    229376.00       2.64    0.97    1202604.25      16384.00
15      437.89  3375.00 7.33    1.65    2.71    491520.00       2.71    1.00    3269017.25      32768.00
16      656.84  4096.00 7.69    1.67    2.77    1048576.00      2.77    1.02    8886111.00      65536.00
17      985.26  4913.00 8.03    1.68    2.83    2228224.00      2.83    1.04    24154952.00     131072.00
18      1477.89 5832.00 8.35    1.70    2.89    4718592.00      2.89    1.06    65659968.00     262144.00
19      2216.84 6859.00 8.67    1.72    2.94    9961472.00      2.94    1.08    178482304.00    524288.00
20      3325.26 8000.00 8.97    1.73    3.00    20971520.00     3.00    1.10    485165184.00    1048576.00
21      4987.89 9261.00 9.27    1.74    3.04    44040192.00     3.04    1.11    1318815744.00   2097152.00
22      7481.83 10648.00        9.55    1.76    3.09    92274688.00     3.09    1.13    3584912896.00   4194304.00
23      11222.74        12167.00        9.83    1.77    3.14    192937984.00    3.14    1.14    9744803840.00   8388608.00
24      16834.11        13824.00        10.10   1.78    3.18    402653184.00    3.18    1.16    26489122816.00  16777216.00
25      25251.17        15625.00        10.36   1.79    3.22    838860800.00    3.22    1.17    72004902912.00  33554432.00
26      37876.75        17576.00        10.62   1.81    3.26    1744830464.00   3.26    1.18    195729604608.00 67108864.00
27      56815.13        19683.00        10.86   1.82    3.30    3623878656.00   3.30    1.19    532048248832.00 134217728.00
28      85222.70        21952.00        11.10   1.83    3.33    7516192768.00   3.33    1.20    1446257098752.00
        268435456.00
29      127834.04       24389.00        11.34   1.84    3.37    15569256448.00  3.37    1.21    3931334246400.00
        536870912.00
30      191751.06       27000.00        11.57   1.84    3.40    32212254720.00  3.40    1.22    10686474223616.00
        1073741824.00
31      287626.59       29791.00        11.79   1.85    3.43    66571993088.00  3.43    1.23    29048849825792.00
        2147483648.00
32      431439.88       32768.00        12.01   1.86    3.47    137438953472.00 3.47    1.24    78962956959744.00
        4294967296.00
33      647159.81       35937.00        12.23   1.87    3.50    283467841536.00 3.50    1.25    214643574308864.00
        8589934592.00
34      970739.75       39304.00        12.44   1.88    3.53    584115552256.00 3.53    1.26    583461710594048.00
        17179869184.00
35      1456109.63      42875.00        12.64   1.89    3.56    1202590842880.00        3.56    1.27    1586013445029888.00     34359738368.00
36      2184164.50      46656.00        12.84   1.89    3.58    2473901162496.00        3.58    1.28    4311231531843584.00     68719476736.00
37      3276246.50      50653.00        13.04   1.90    3.61    5085241278464.00        3.61    1.28    11719142537166848.00    137438953472.00
38      4914370.00      54872.00        13.23   1.91    3.64    10445360463872.00       3.64    1.29    31855931348221952.00    274877906944.00
39      7371555.00      59319.00        13.42   1.91    3.66    21440476741632.00       3.66    1.30    86593404045099008.00    549755813888.00
40      11057332.00     64000.00        13.61   1.92    3.69    43980465111040.00       3.69    1.31    235385270340419580.00   1099511627776.00
```



Observation: We observe the 2D plots for the various functions. The plots change according to given function with increase in value of n i.e. on x-axis.