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EXPERIMENT:	1
BATCH:	A3

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\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:

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	1.00	-1.00	0.00	-1.00	1.00	1.00	1.00	1.00
1	1.50	1.00	0.00	0.00	2.00	0.00	-1.00	2.72	2.00	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	17179869184.00
32	431439.88	32768.00	12.01	1.86	3.47	137438953472.00	3.47	1.24	78962956959744.00	2147483648.00
33	647159.81	35937.00	12.23	1.87	3.50	283467841536.00	3.50	1.25	214643574308864.00	431439.88
34	970739.75	39304.00	12.44	1.88	3.53	584115552256.00	3.53	1.26	583461710594048.00	4294967296.00
35	1456109.63	42875.00	12.64	1.89	3.56	1202590842880.00	3.56	1.27	1586013445029888.00	647159.81
36	2184164.50	46656.00	12.84	1.89	3.58	2473901162496.00	3.58	1.28	4311231531843584.00	8589934592.00
37	3276246.50	50653.00	13.04	1.90	3.61	5085241278464.00	3.61	1.28	11719142537166848.00	970739.75
38	4914370.00	54872.00	13.23	1.91	3.64	10445360463872.00	3.64	1.29	31855931348221952.00	17179869184.00
39	7371555.00	59319.00	13.42	1.91	3.66	21440476741632.00	3.66	1.30	86593404045099008.00	2184164.50
40	11057332.00	64000.00	13.61	1.92	3.69	43980465111040.00	3.69	1.31	235385270340419580.00	3276246.50

```
Factorial of first 20 numbers:
Number factorial
0 1.00
1 1.00
2 2.00
3 6.00
4 24.00
5 120.00
6 720.00
7 5040.00
8 40320.00
9 362880.00
10 3628800.00
11 39916800.00
12 479001600.00
13 6227020800.00
14 87178289152.00
15 1307674279936.00
16 20922788478976.00
17 355687414628352.00
18 6402373530419200.00
19 121645096004222980.00
20 2432902023163674600.00

Process returned 0 (0x0) execution time : 0.122 s
Press any key to continue.
```

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.