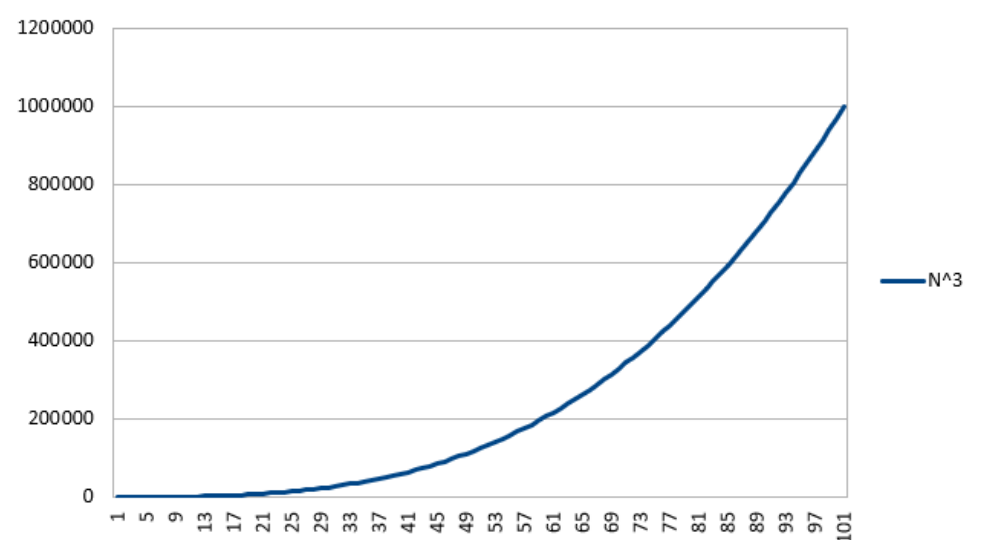


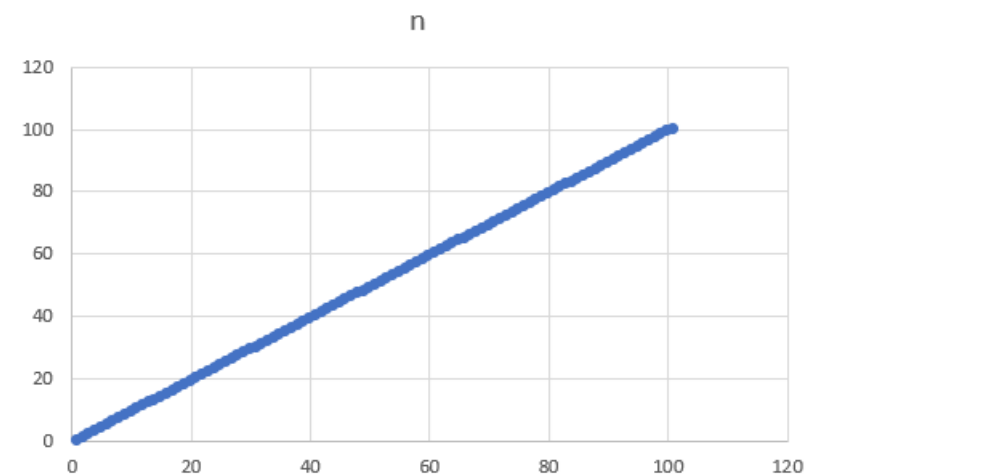
<b>NAME</b>	Darshana Chothave
<b>UID</b>	2021300021
<b>SUBJECT</b>	DAA
<b>EXPERIMENT NO.</b>	1
<b>CLASS</b>	SE COMPS-A
<b>BATCH</b>	D
<b>AIM</b>	To implement the various functions e.g. linear, non-linear, quadratic, exponential etc.
<b>PROGRAM</b>	<pre> #include &lt;stdio.h&gt; #include &lt;math.h&gt; int main() {     //int i,n=100;     for(int i=0;i&lt;=100;i++)     {         printf("Number is : %d and cube of the %d is :%d \n",i,i, (i*i*i));     }     printf("-----\n");     for(int i=0;i&lt;=100;i++)     {         printf("The number is: %d\n",i);     }     printf("-----\n");     for(double i=0;i&lt;=100;i++)     {         printf("The value of ln.%f is: %f\n",i,log(i));     }     printf("-----\n");     for(double i=0;i&lt;=100;i++)     {         printf("The value of ln(ln.%f) is: %f\n",i,log(log(i)));     }     for(double i=0;i&lt;=100;i++)     {         printf("The value of %f.2^%f is: %f\n",i,i*pow(2,i));     }     printf("-----\n");     for(double i=0;i&lt;=100;i++)     {         printf("The value of (3/2)^%f is: %f\n",i,pow(1.5,i));     }     printf("-----\n");     for(double i=0;i&lt;=100;i++)     {         printf("The value of 2^2^%f is: %f\n",i,pow(2,pow(2,i)));     }     printf("-----\n");     for(double i=0;i&lt;=100;i++)     {         printf("The value of 2^2^(%f+1) is: %f\n",i,pow(2,pow(2,i+1)));     }     printf("-----\n");     for(double i=0;i&lt;=100;i++) </pre>

	<pre> {     printf("The value of lg.%f is: %f\n",i,log10(i)); } printf("-----\n"); for(double i=0;i&lt;=100;i++) {     printf("The value of 2^lg.%f is: %f\n",i,pow(2,log10(i))) } </pre>										
OBSERVATION	Input	N^3	n	ln.n	ln(ln.n)	n.2^n	(3/2)^n	2^2^n	2^2^(n+1)	lg.n	2^lg.n
	0	0	0	-inf	-nan	0	1	2	4	-inf	0
	1	1	1	0	-inf	2	1.5	4	16	0	1
	2	8	2	0.693147	-0.366513	8	2.25	16	256	0.30103	1.232024
	3	27	3	1.098612	0.094048	24	3.375	256	65536	0.477121	1.391963
	4	64	4	1.386294	0.326634	64	5.0625	65536	4.295E+09	0.60206	1.517882
	5	125	5	1.609438	0.475885	160	7.59375	4.295E+09	1.845E+19	0.69897	1.623345
	6	216	6	1.791759	0.583198	384	11.390625	1.845E+19	3.403E+38	0.778151	1.714932
	7	343	7	1.94591	0.66573	896	17.085938	3.403E+38	1.158E+77	0.845098	1.796387
	8	512	8	2.079442	0.732099	2048	25.628906	1.158E+77	1.34E+154	0.90309	1.870067
	9	729	9	2.197225	0.787195	4608	38.443359	1.34E+154	inf	0.954243	1.937562
	10	1000	10	2.302585	0.834032	10240	57.665039	inf	inf	1	2
	11	1331	11	2.397895	0.874591	22528	86.497559	inf	inf	1.041393	2.058214
	12	1728	12	2.484907	0.910235	49152	129.74634	inf	inf	1.079181	2.112837
	13	2197	13	2.564949	0.941939	106496	194.61951	inf	inf	1.113943	2.164364
	14	2744	14	2.639057	0.970422	229376	291.92926	inf	inf	1.146128	2.213191
	15	3375	15	2.70805	0.996229	491520	437.89389	inf	inf	1.176091	2.259637
	16	4096	16	2.772589	1.019781	1048576	656.84084	inf	inf	1.20412	2.303967
	17	4913	17	2.833213	1.041412	2228224	985.26125	inf	inf	1.230449	2.3464
	18	5832	18	2.890372	1.061385	4718592	1477.8919	inf	inf	1.255273	2.387122
	19	6859	19	2.944439	1.079918	9961472	2216.8378	inf	inf	1.278754	2.426293
	20	8000	20	2.995732	1.097189	20971520	3325.2567	inf	inf	1.30103	2.464047
	21	9261	21	3.044522	1.113344	44040192	4987.8851	inf	inf	1.322219	2.500505
	22	10648	22	3.091042	1.128508	92274688	7481.8276	inf	inf	1.342423	2.535768
	23	12167	23	3.135494	1.142787	192937984	11222.741	inf	inf	1.361728	2.569928
	24	13824	24	3.178054	1.156269	402653184	16834.112	inf	inf	1.380211	2.603065
	25	15625	25	3.218876	1.169032	838860800	25251.168	inf	inf	1.39794	2.63525
	26	17576	26	3.258097	1.181143	1.745E+09	37876.752	inf	inf	1.414973	2.666548
	27	19683	27	3.295837	1.19266	3.624E+09	56815.129	inf	inf	1.431364	2.697015
	28	21952	28	3.332205	1.203634	7.516E+09	85222.693	inf	inf	1.447158	2.726704
	29	24389	29	3.367296	1.21411	1.557E+10	127834.04	inf	inf	1.462398	2.75566
	30	27000	30	3.401197	1.224128	3.221E+10	191751.06	inf	inf	1.477121	2.783927
	31	29791	31	3.433987	1.233722	6.657E+10	287626.59	inf	inf	1.491362	2.811542
	32	32768	32	3.465736	1.242925	1.374E+11	431439.88	inf	inf	1.50515	2.838542
	33	35937	33	3.496508	1.251765	2.835E+11	647159.82	inf	inf	1.518514	2.864958
	34	39304	34	3.526361	1.260266	5.841E+11	970739.74	inf	inf	1.531479	2.89082
	35	42875	35	3.555348	1.268453	1.203E+12	1456109.6	inf	inf	1.544068	2.916156
	36	46656	36	3.583519	1.276345	2.474E+12	2184164.4	inf	inf	1.556303	2.940991
	37	50653	37	3.610918	1.283962	5.085E+12	3276246.6	inf	inf	1.568202	2.965349
	38	54872	38	3.637586	1.29132	1.045E+13	4914369.9	inf	inf	1.579784	2.98925
	39	59319	39	3.663562	1.298436	2.144E+13	7371554.9	inf	inf	1.591065	3.012716
	40	64000	40	3.688879	1.305323	4.398E+13	11057332	inf	inf	1.60206	3.035765
	41	68921	41	3.713572	1.311994	9.016E+13	16585998	inf	inf	1.612784	3.058414
	42	74088	42	3.73767	1.318462	1.847E+14	24878998	inf	inf	1.623249	3.080681
	43	79507	43	3.7612	1.324738	3.782E+14	37318497	inf	inf	1.633468	3.10258
	44	85184	44	3.78419	1.330832	7.741E+14	55977745	inf	inf	1.643453	3.124126
	45	91125	45	3.806662	1.336753	1.583E+15	83966617	inf	inf	1.653213	3.145332
	46	97336	46	3.828641	1.34251	3.237E+15	125949926	inf	inf	1.662758	3.166212
	47	103823	47	3.850148	1.348111	6.615E+15	188924889	inf	inf	1.672098	3.186777
	48	110592	48	3.871201	1.353565	1.351E+16	283387333	inf	inf	1.681241	3.207038
	49	117649	49	3.89182	1.358877	2.758E+16	425081000	inf	inf	1.690196	3.227006
	50	125000	50	3.912023	1.364055	5.629E+16	637621500	inf	inf	1.69897	3.246691
	51	132651	51	3.931826	1.369104	1.148E+17	956432250	inf	inf	1.70757	3.266103
	52	140608	52	3.951244	1.37403	2.342E+17	1.435E+09	inf	inf	1.716003	3.28525
	53	148877	53	3.970292	1.37884	4.774E+17	2.152E+09	inf	inf	1.724276	3.304142
	54	157464	54	3.988984	1.383537	9.728E+17	3.228E+09	inf	inf	1.732394	3.322787
	55	166375	55	4.007333	1.388126	1.982E+18	4.842E+09	inf	inf	1.740363	3.341192
	56	175616	56	4.025352	1.392612	4.035E+18	7.263E+09	inf	inf	1.748188	3.359364
	57	185193	57	4.043051	1.397	8.215E+18	1.089E+10	inf	inf	1.755875	3.377311
	58	195112	58	4.060443	1.401292	1.672E+19	1.634E+10	inf	inf	1.763428	3.395039
	59	205379	59	4.077537	1.405493	3.401E+19	2.451E+10	inf	inf	1.770852	3.412554
	60	216000	60	4.094345	1.409607	6.918E+19	3.677E+10	inf	inf	1.778151	3.429864
	61	226981	61	4.110874	1.413636	1.407E+20	5.515E+10	inf	inf	1.78533	3.446973
	62	238328	62	4.127134	1.417583	2.859E+20	8.273E+10	inf	inf	1.792392	3.463887
	63	250047	63	4.143135	1.421453	5.811E+20	1.241E+11	inf	inf	1.799341	3.480611
	64	262144	64	4.158883	1.425247	1.181E+21	1.861E+11	inf	inf	1.80618	3.497151
	65	274625	65	4.174387	1.428968	2.398E+21	2.792E+11	inf	inf	1.812913	3.513511
	66	287496	66	4.189655	1.432618	4.87E+21	4.188E+11	inf	inf	1.819544	3.529696
	67	300763	67	4.204693	1.436201	9.887E+21	6.282E+11	inf	inf	1.826075	3.545711
	68	314432	68	4.219508	1.439718	2.007E+22	9.423E+11	inf	inf	1.832509	3.561559
	69	328509	69	4.234107	1.443172	4.073E+22	1.414E+12	inf	inf	1.838849	3.577245

70	343000	70	4.248495	1.446565	8.264E+22	2.12E+12	inf	inf	1.845098	3.592774
71	357911	71	4.26268	1.449898	1.676E+23	3.18E+12	inf	inf	1.851258	3.608148
72	373248	72	4.276666	1.453174	3.4E+23	4.771E+12	inf	inf	1.857332	3.623371
73	389017	73	4.290459	1.456394	6.895E+23	7.156E+12	inf	inf	1.863323	3.638447
74	405224	74	4.304065	1.45956	1.398E+24	1.073E+13	inf	inf	1.869232	3.65338
75	421875	75	4.317488	1.462674	2.833E+24	1.61E+13	inf	inf	1.875061	3.668172
76	438976	76	4.330733	1.465737	5.742E+24	2.415E+13	inf	inf	1.880814	3.682827
77	456533	77	4.343805	1.468751	1.164E+25	3.623E+13	inf	inf	1.886491	3.697348
78	474552	78	4.356709	1.471717	2.357E+25	5.434E+13	inf	inf	1.892095	3.711737
79	493039	79	4.369448	1.474637	4.775E+25	8.151E+13	inf	inf	1.897627	3.725998
80	512000	80	4.382027	1.477511	9.671E+25	1.223E+14	inf	inf	1.90309	3.740134
81	531441	81	4.394449	1.480342	1.958E+26	1.834E+14	inf	inf	1.908485	3.754147
82	551368	82	4.406719	1.48313	3.965E+26	2.751E+14	inf	inf	1.913814	3.768039
83	571787	83	4.418841	1.485877	8.027E+26	4.126E+14	inf	inf	1.919078	3.781813
84	592704	84	4.430817	1.488584	1.625E+27	6.19E+14	inf	inf	1.924279	3.795472
85	614125	85	4.442651	1.491251	3.288E+27	9.284E+14	inf	inf	1.929419	3.809018
86	636056	86	4.454347	1.493881	6.654E+27	1.393E+15	inf	inf	1.934498	3.822452
87	658503	87	4.465908	1.496473	1.346E+28	2.089E+15	inf	inf	1.939519	3.835778
88	681472	88	4.477337	1.499028	2.723E+28	3.134E+15	inf	inf	1.944483	3.848997
89	704969	89	4.488636	1.501549	5.509E+28	4.7E+15	inf	inf	1.94939	3.862112
90	729000	90	4.49981	1.504035	1.114E+29	7.05E+15	inf	inf	1.954243	3.875124
91	753571	91	4.51086	1.506488	2.253E+29	1.058E+16	inf	inf	1.959041	3.888036
92	778688	92	4.521789	1.508908	4.556E+29	1.586E+16	inf	inf	1.963788	3.900848
93	804357	93	4.532599	1.511296	9.21E+29	2.38E+16	inf	inf	1.968483	3.913564
94	830584	94	4.543295	1.513652	1.862E+30	3.569E+16	inf	inf	1.973128	3.926184
95	857375	95	4.553877	1.515979	3.763E+30	5.354E+16	inf	inf	1.977724	3.938711
96	884736	96	4.564348	1.518276	7.606E+30	8.031E+16	inf	inf	1.982271	3.951146
97	912673	97	4.574711	1.520544	1.537E+31	1.205E+17	inf	inf	1.986772	3.963491
98	941192	98	4.584967	1.522783	3.106E+31	1.807E+17	inf	inf	1.991226	3.975747
99	970299	99	4.59512	1.524995	6.275E+31	2.71E+17	inf	inf	1.995635	3.987916
100	1000000	100	4.60517	1.52718	1.268E+32	4.066E+17	inf	inf	2	4



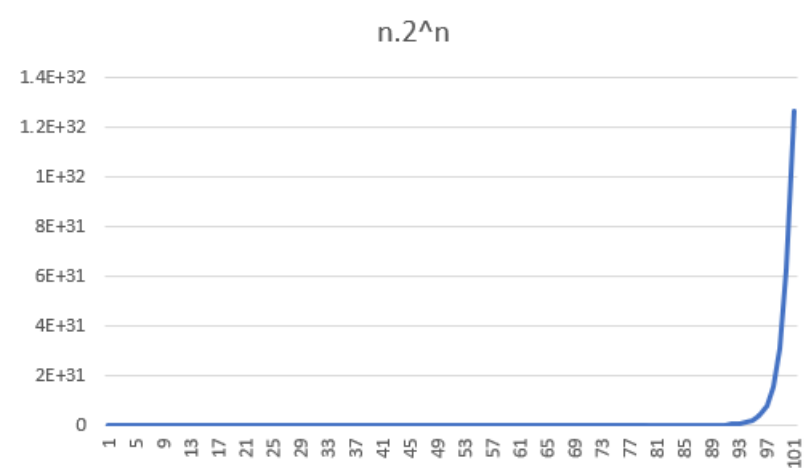
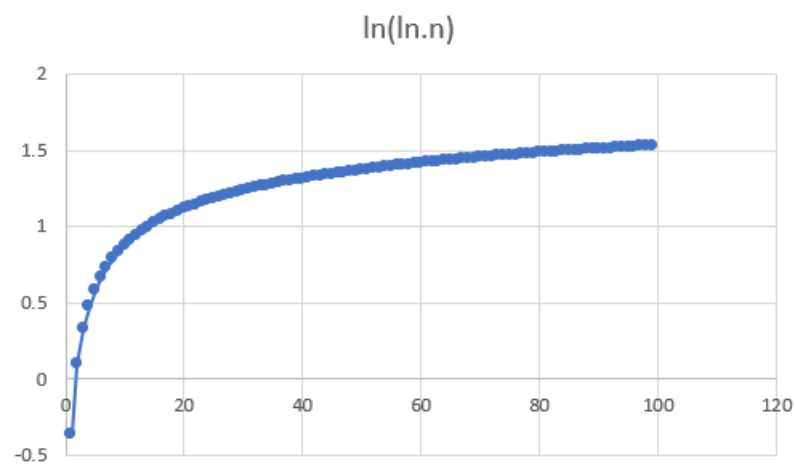
Increasing cubically



Increasing linearly with value.

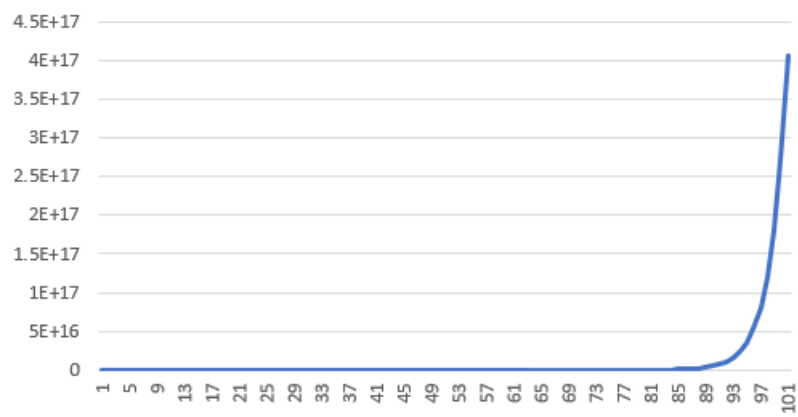


Increases in logarithmic form



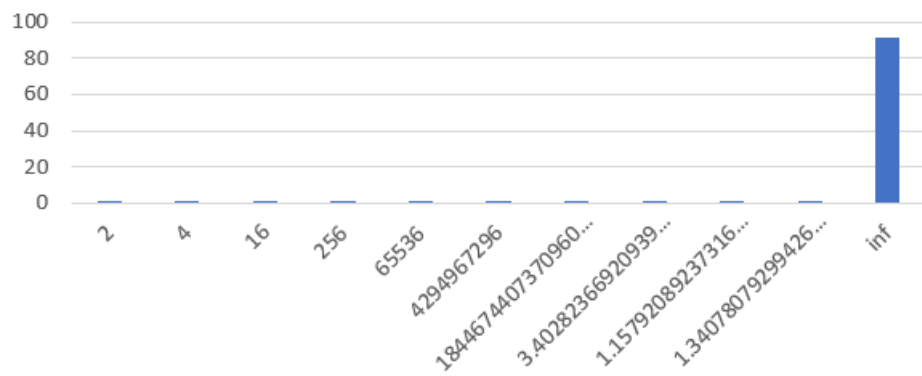
Increases exponentially

$$(3/2)^n$$



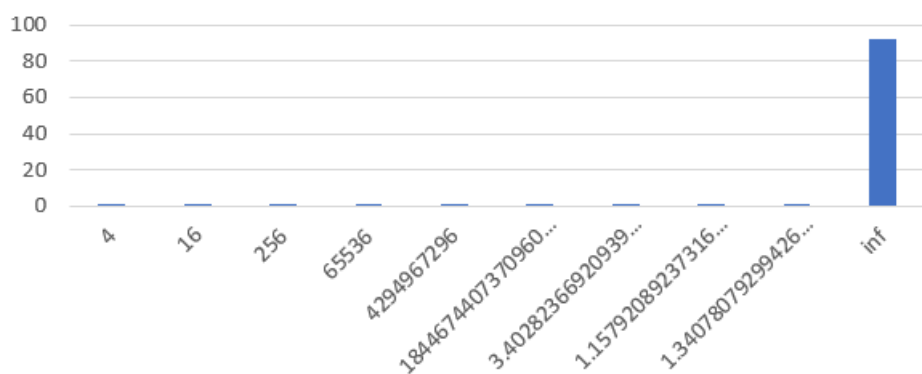
Increases 1.5 folds with increase in each value

$$2^{2^n}$$



Increases exponentially

$$2^{2^{(n+1)}}$$



Increases exponentially

	<div data-bbox="406 197 1197 672"> <p style="text-align: center;"><math>\lg.n</math></p> <p>increases logarithmically</p> </div> <div data-bbox="406 761 1197 1232"> <p style="text-align: center;"><math>2^{\lg.n}</math></p> </div>
<b>CONCLUSION</b>	<p>The above experiment made me understand about the various exponential, linear and logarithmic functions while implementing them in the C programming language. Each spike is seen with a very big gap as all the functions are highly increasing.</p>