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Sardar Patel Institute of Technology
Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai-400058-India
(Autonomous College Affiliated to University of Mumbai)

SE – COMP (SE-A)
Sub- DAA Lab

Name	Rahil Ankhad
UID No.	2021300003
Subject	Design And Analysis of Algorithm
Class	Comps A
Experiment No.	1a
AIM	To implement the various functions e.g., linear, non-linear, quadratic, exponential etc.

Theory –

In this experiment, we implemented 10 different functions as follows:
1. $(3/2)^n$
2. n^3
3. (2^{2^n})
4. $n*2^n$
5. n
6. 2^n
7. e^n
8. $2^{(\log_2 (n))}$
9. $\log n$
10. $2^{(\log_2 (n))}$
11. n Factorial

Algorithm –

The algorithm being used here is basically the function to be printed with n ranging from 0 to 100 for each function.

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Program –

```c
#include <stdio.h>
#include <stdlib.h>
#include <math.h>

int factorial(int num)
{
    if (num == 1 || num == 0)
    {
        return 1;
    }
    else
    {
        return num * factorial(num - 1);
    }
}

int main()
{
    double n;
    double temp;
    printf("Enter the value of n:\n");
    scanf("%lf", &n);
    for (double i = 0; i <= n; i++)
    {
        int result;
        result = factorial(i);
        //printf("The factorial of %lf is %d\n", i, result);
        printf("%d\n", result);
```

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```
        // temp=pow(1.5,i);
        // temp=pow(i,3.0);
        // temp=pow(2.0,pow(2.0,i));
        // temp=i*pow(2.0,i);
        // temp=i;
        // temp=pow(2.0,i);
        // temp=exp(i);
        // temp=pow(2.0,log2(i));
        // temp=log(i);
        //temp=pow(2.0,log2(i));


         //printf("%lf\n", temp);
    }
}
```
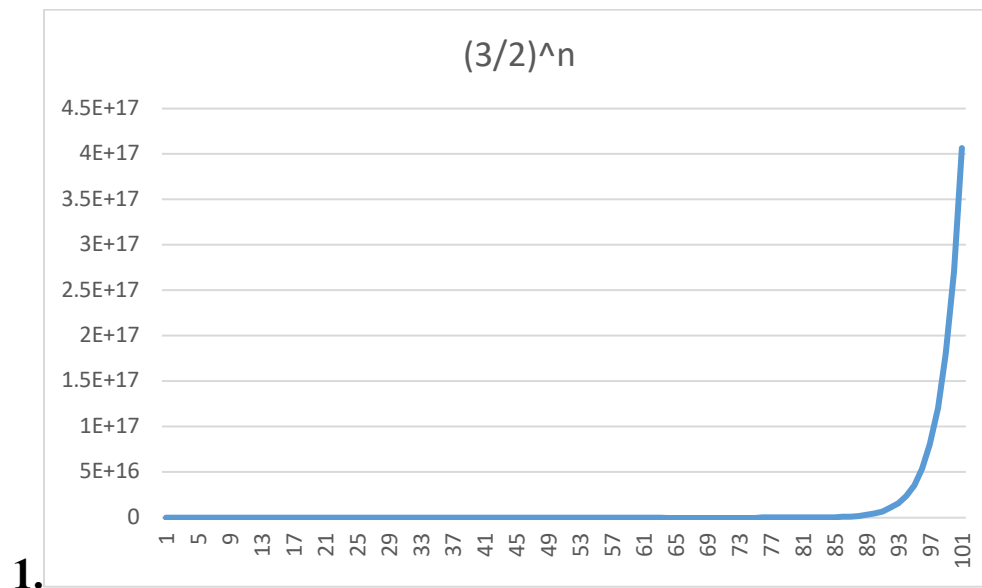
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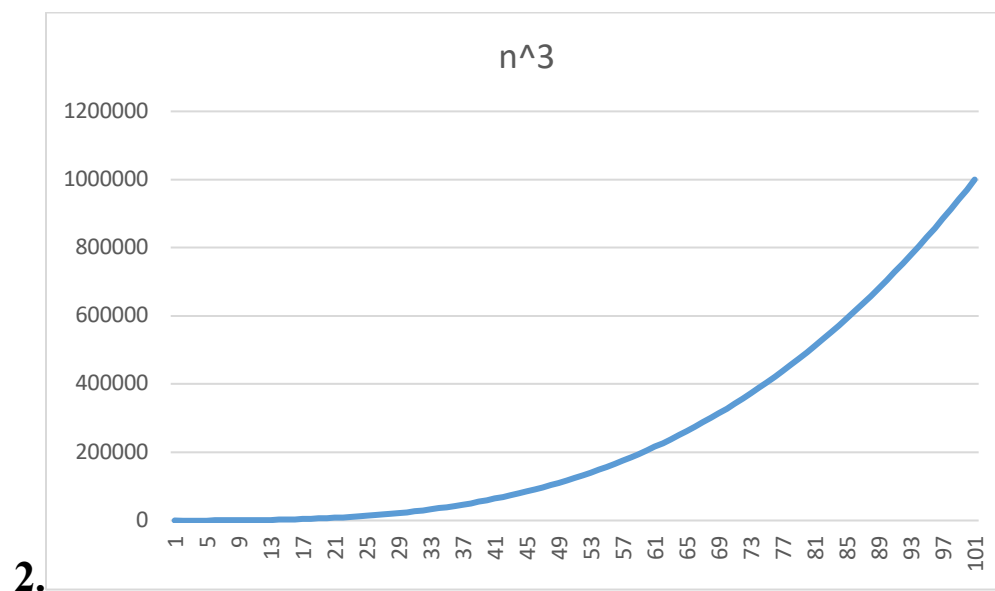**Sub- DAA Lab**

Result Analysis –

1.

This Graph Shows a sharp Change when the values of n reaches 93

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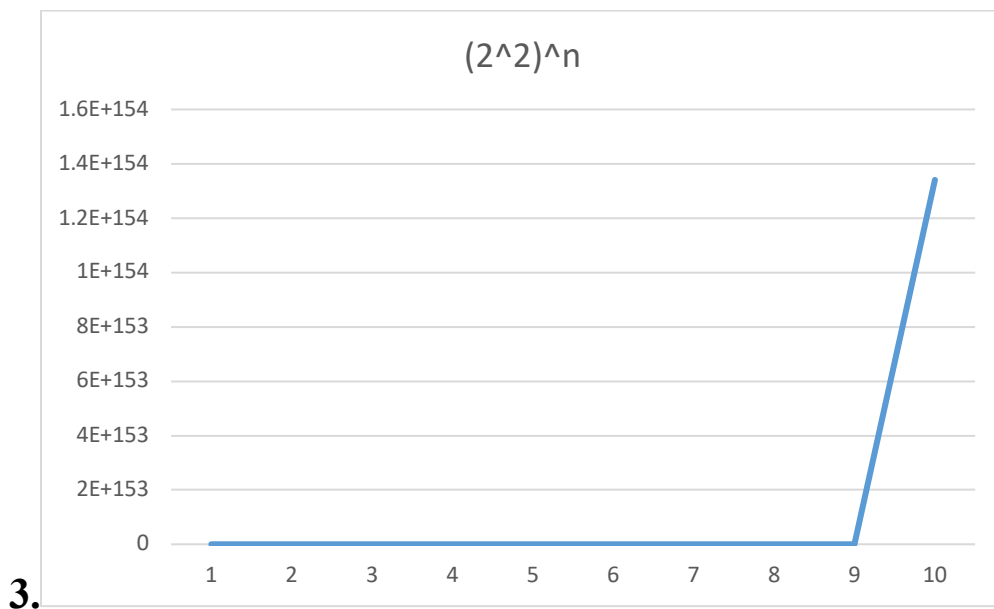**SE – COMP (SE-A)**

Sub- DAA Lab

2.

This is a Basic n-cube Graph where the values increase significantly when the value of n reaches 50

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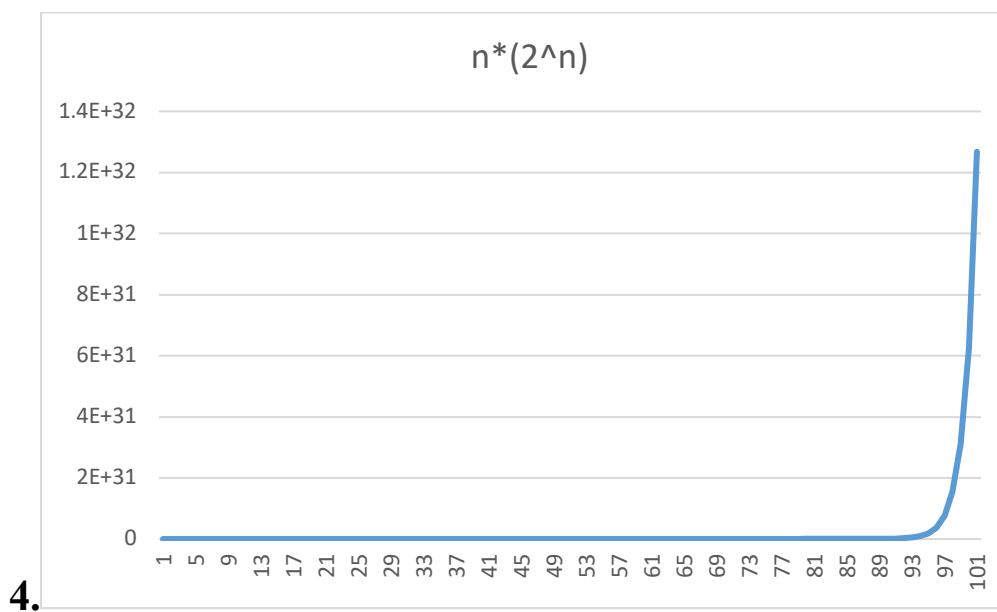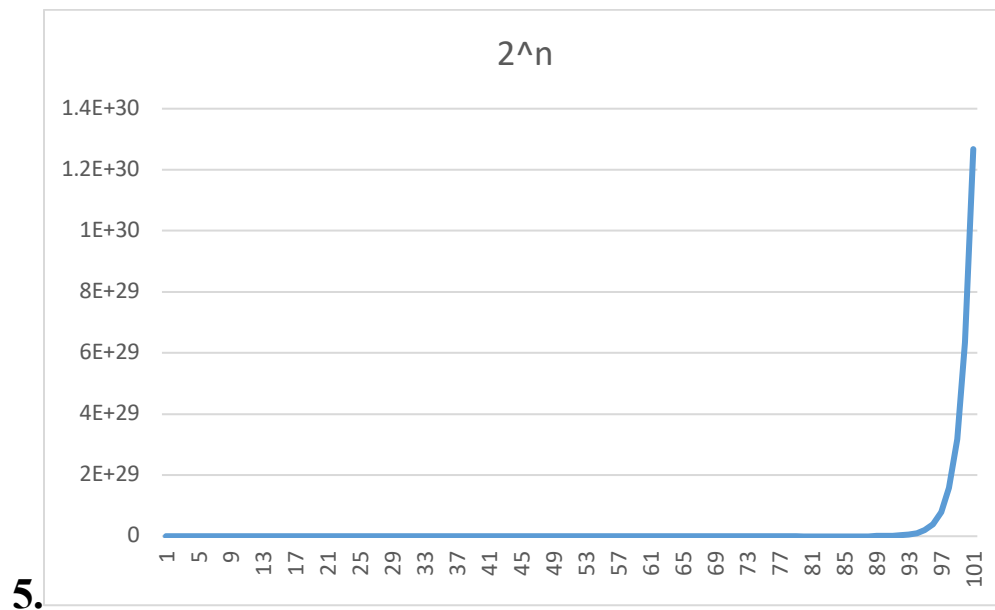**SE – COMP (SE-A)**

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3.

$(2^2)^n$

In this Graph, there is a sharp change in curve when value reaches 9.

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4.

In this Graph there is a sharp change in curve when value reaches 97.

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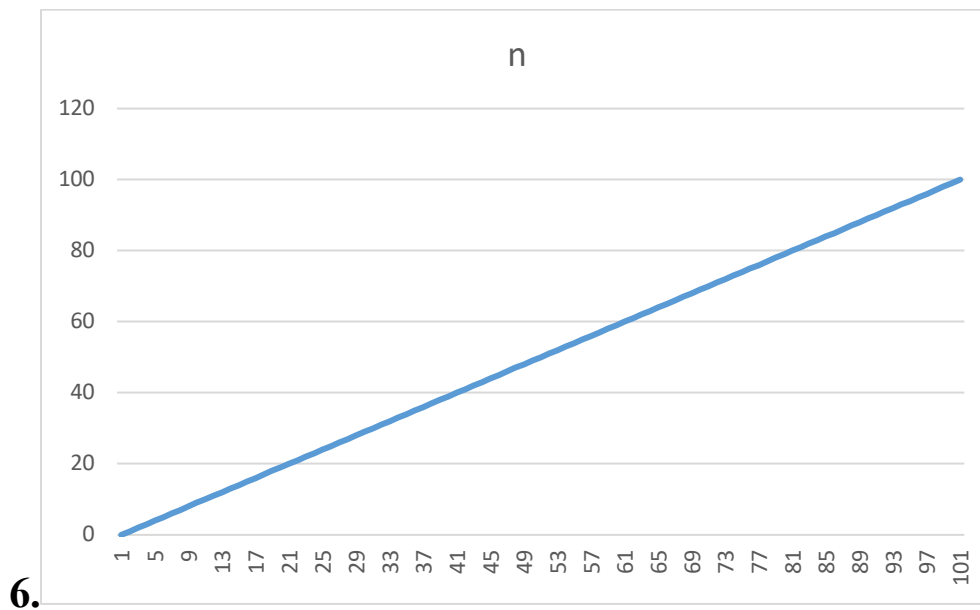
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5.

In this Graph there is a sharp change in curve when value reaches 97.

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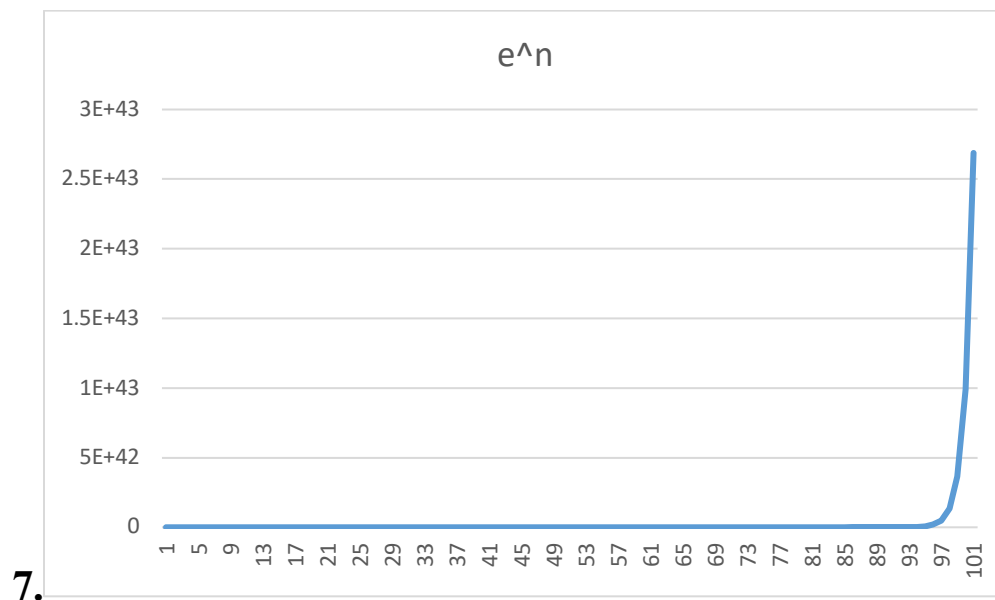
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6.

This is a Linear graph where time Complexity increases with the increase in values of n.

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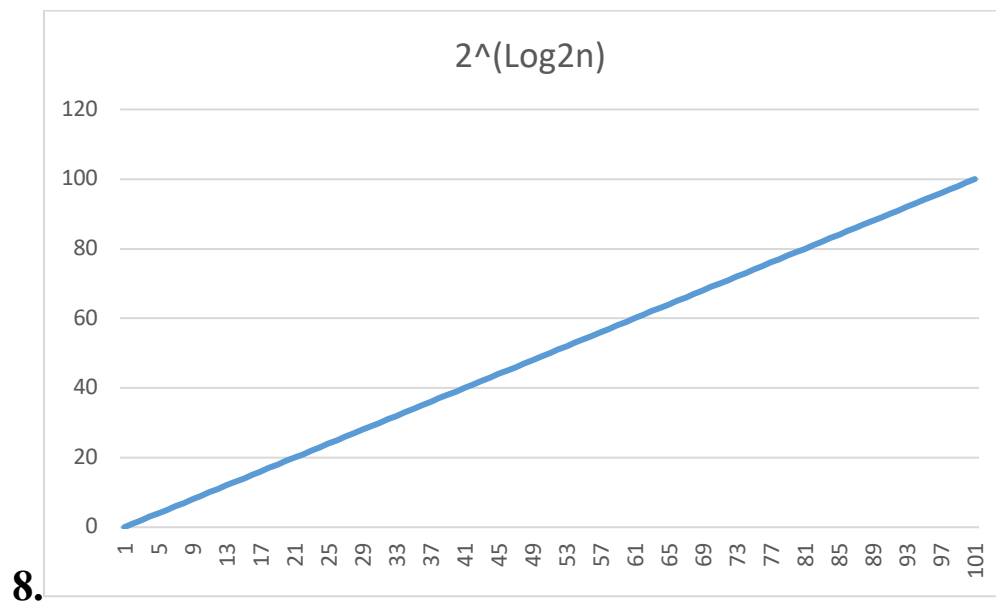
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7.

In this curve, we can see a very sharp increase in the graph when the value reaches 97

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8.

This is a Linear graph where time Complexity increases with the increase in values of n.

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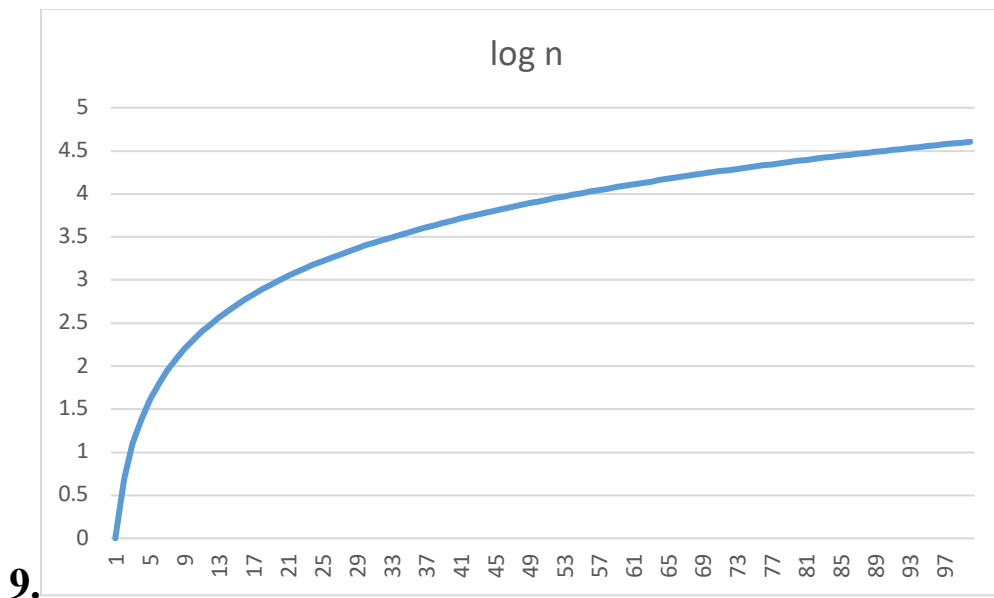
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9.

This is the graph of the Natural Logarithm initially, the curve makes sharp changes, but as the values of n increase the curve flattens.

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2^(log2n)
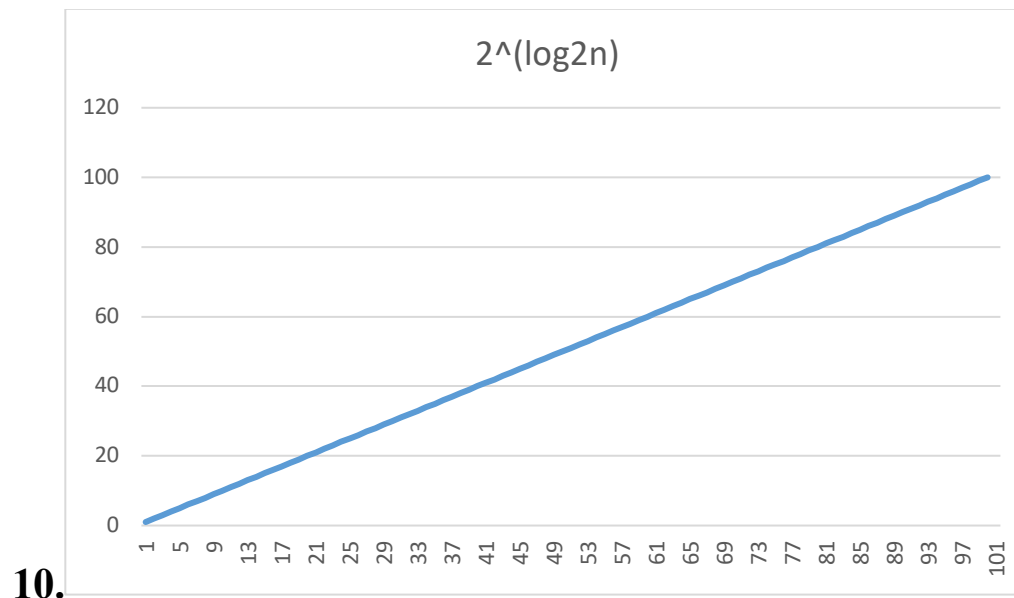
10.

This is a Linear graph where time Complexity increases with the increase in values of n.

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Result: **In this experiment we observed various Graphs and their plot for values of n ranging from 0-100.**