**Worksheet - 2**

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**Branch:** BE CSE **Section/Group:** 20BCS\_WM\_707-B

**Semester:** 5 **Date of Performance:** 23/08/2022

**Subject Name:** Design & Analysis of Algorithm **Subject Code:** 20CSP-312

**1. Aim/Overview of the practical:**

Power Function.

**2. Algorithm/ Which logistics used:**

**A. O(n):**

1. Take x and n as parameters,
2. Check if x is equals to zero otherwise go to 4.,
3. Give back 1,
4. Give back the product of x and call A function with parameter as x and n-1.
5. **O(logn):**
6. Take x and n as parameters,
7. Check if x is equals to zero otherwise go to 4.,
8. Give back 1,
9. Check if n is even otherwise go to 6.,
10. Give back the square of result of Call B function with parameter as x and n/2,
11. Give back the product of x and call A function with parameter as x and n-1.

**3. Code:**

#include <bits/stdc++.h>

using namespace std;

long int pown(int x, int n){

if(n == 0){

return 1;

}

return x \* pown(x, n-1);

}

long int powlogn(int x, int n){

if(n == 0){

return 1;

} else if(n % 2 == 0){

long int y = powlogn(x, n/2);

return y \* y;

}

return x \* powlogn(x, n - 1);

}

int main() {

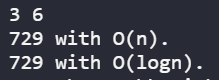
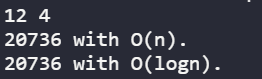
int x, n; cin>>x>>n;

cout<<pown(x, n)<<" with O(n).\n";

cout<<powlogn(x, n)<<" with O(logn).\n";

}

1. **Result/Output:**

**Learning outcomes (What I have learnt):**

1. Understood the Power function.
2. Learnt about the recursive nature of power function by modulus and direct approach.

**Evaluation Grid (To be created as per the SOP and Assessment guidelines by the faculty):**

|  |  |  |  |
| --- | --- | --- | --- |
| Sr. No. | Parameters | Marks Obtained | Maximum Marks |
| 1. |  |  |  |
| 2. |  |  |  |
| 3. |  |  |  |