Experiment 1.2

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Semester: 5　　　　　**Date of Performance: 8 AUG 2022**

Subject Name: DAA Lab　　　　　**Subject Code: 20CSP-312**

1. Aim/Overview of the practical: Code implement power function in O(logn) time complexity.

2. Task to be done/ Which logistics used:

Find a^b using divide and conqueror algorithm

3. Algorithm/Flowchart (For programming based labs)**:**

Step 1: Let a, b be the two numbers Step 2: Call function power(a,b)
Step 3: If b=0 return 1 go to step 7
Step 4: If b<0 return 1/power(a,-b) and go to step 2 Step 5: If b is even return power(a,b/2) * power(a,b/2) go to step 2
Step 6: If b is odd return (a*power(a,(b-1)/2)*power(a,(b-1)/2) go to step 2 Step 7: Finish

4. Steps for experiment/practical/Code:

```cpp
#include <iostream>
using namespace std; int
power(int a, int b)
{ if (b == 0)
    return 1;
    if (b < 0) return 1 /
        power(a, -b);
    if (b % 2 == 0)
```

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```
        return power(a, b / 2) * power(a, b / 2);
    else return a * power(a, (b - 1) / 2) * power(a, (b - 1) /
        2);
} int
main()
{ int a, b; cin >> a >> b; cout << a << "^" <<
    b << "=" << power(a, b); return 0;
}
```

5. Observations/Discussions/ Complexity Analysis:

Time Complexity:- O(log(n))

6. Result/Output/Writing Summary:

```
PS E:\Sem 5\Design Algorithm Lab> c
Enter value of a: 5
Enter value of b: 10
GCD of 5 and 10 is 5
```

Learning outcomes (What I have learnt):

1. To calculate a^b using divide and conqueror with time complexity O(log(n))