Experiment-3.3

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Subject Name: Advanced Programming Lab-1 **Subject Code: 21CSP-314**

1. Aim:

Implement the problems based on Greedy and Branch and Bound.

2. Objective:

I. **Marc's Cake-walk Problem**
II. **Grid Challenge Problem.**

3. Code:

- **Marc's Cake-walk Problem:**

```
#include <bits/stdc++.h>

using namespace std;

int main(){
    int n;
    cin >> n;
    vector<int> calories(n);
    for(int calories_i = 0; calories_i < n; calories_i++){
       cin >> calories[calories_i];
    }
    // your code goes here
    sort(calories.begin(),calories.end());
    reverse(calories.begin(),calories.end());
    long long temp=1,ans=0;
    for(int i=0;i<n;i++)
    {
        ans+=calories[i]*temp;
        temp*=2;
```

```
        }
        printf("%lld\n",ans);
        return 0;
    }
```

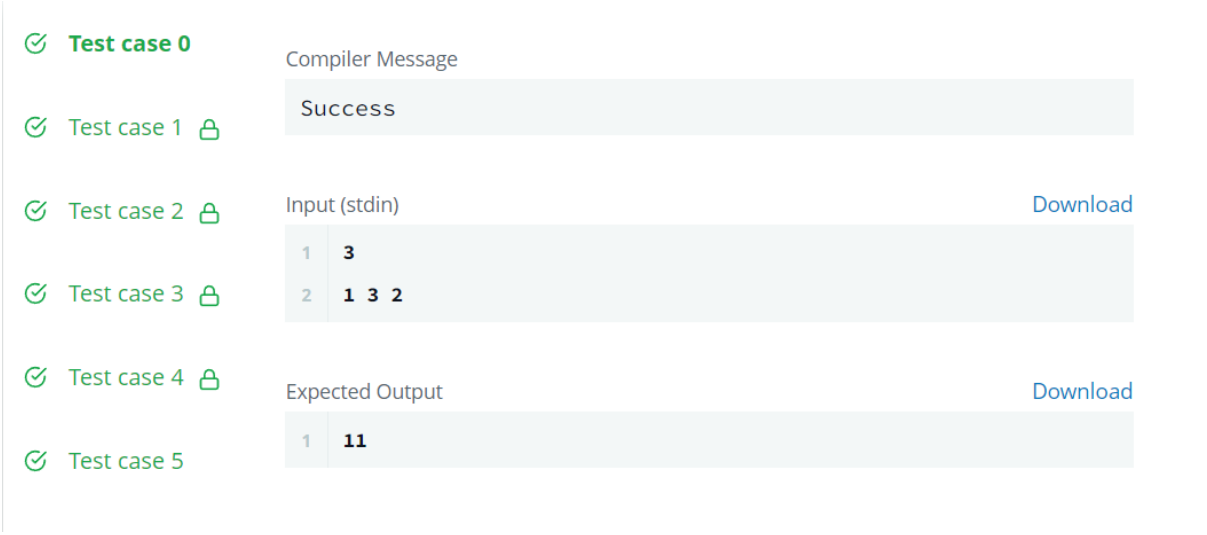
- **Grid Challenge Problem.**

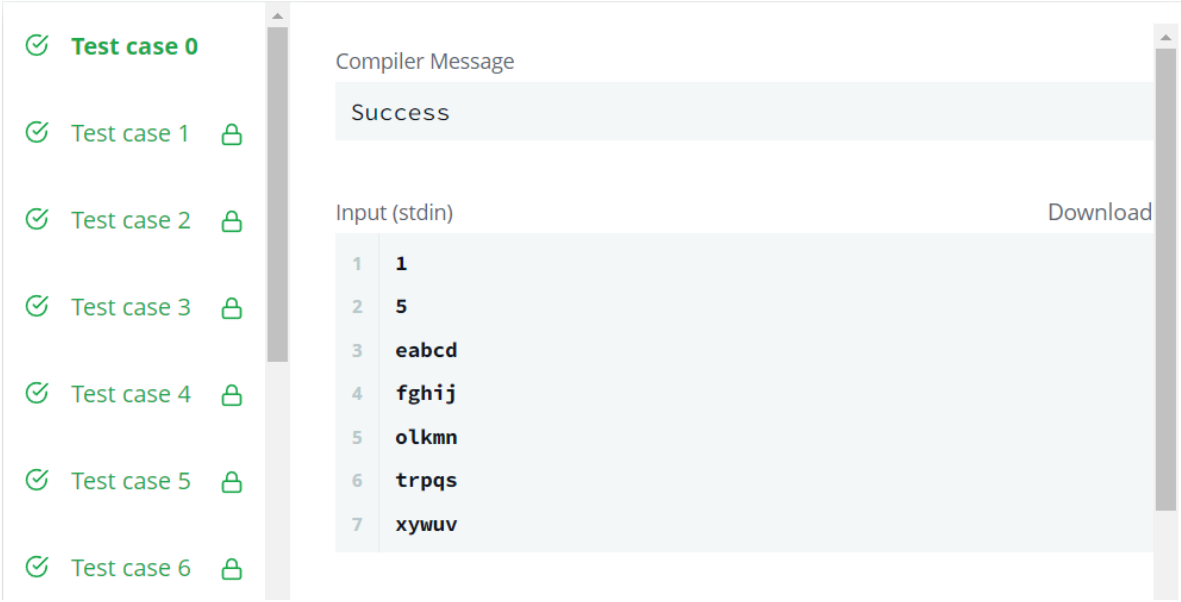
```
#include <iostream>
#include <algorithm>
#include <string>
using namespace std;

string s[111];

int main() {
    int t;
    cin >> t;
    while (t--) {
        int n;
        cin >> n;
        for (int i = 0; i < n; i++) cin >> s[i], sort(s[i].begin(), s[i].end());
        bool flag = true;
        for (int i = 0; i < n; i++) for (int j = 0; j + 1 < n; j++) if (s[j][i] > s[j + 1][i]) fl
ag = false;
        puts(flag ? "YES" : "NO");
    }
    return 0;
}
```

4. Output:





5. Learning and Outcomes:

- Concept of Greedy and Branch-n-Bound.
- Understanding of Greedy in arrays & strings.
- To understand how to apply greedy approach in a problem.