Experiment 10 (Greedy and Branch Bound)

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Subject: Competitive Coding **Subject Code: 20CSP_314**

1. Aim/Overview of the Practical:

a. Grid Challenge.

b. Beautiful Pairs.

2. Task to be done / Which logistics used:

a. Complete the gridChallenge function in the editor below.

gridChallenge has the following parameter(s):

- string grid[n]: an array of strings

Returns

- string: either YES or NO

b. Complete the beautifulPairs function in the editor below. It should return an integer that represents the maximum number of pairwise disjoint beautiful pairs that can be formed.

beautifulPairs has the following parameters:

A: an array of integers

B: an array of integers

3. Steps for experiment/practical/Code:

a. Grid Challenge

```
#include<bits/stdc++.h>
 using namespace std;
 #define rep(i,a,b) for(int i = a; i < b; i++)
 #define S(x) scanf("%d",&x)
 #define P(x) printf("%d\n",x)

 typedef long long int LL;
 string s[111];

 int main() {
    int t;
    S(t);
    while(t--) {
       int n;
       S(n);



       rep(i,0,n) {
          cin >> s[i];
          sort(s[i].begin(), s[i].end());
       }

       bool flag = true;
```

```
        rep(i,0,n) {
            rep(j,1,n) if(s[j][i] < s[j-1][i])
                flag = false;
        }
        if(!flag) printf("NO\n");
        else printf("YES\n");
    }

    return 0;
}
```

b. Beautiful Pairs:

```
#include <cmath>
#include <cstdio>
#include <vector>
#include <iostream>
#include <algorithm>
using namespace std;

int main() {
    int n,x,ans;
    vector<int> a(1001),b(1001);
    scanf("%d",&n);
    for(int i=0;i<n;i++)
        {
```

```
        scanf("%d",&x);
        a[x]++;
    }
    for(int i=0;i<n;i++)
        {
        scanf("%d",&x);
        b[x]++;
    }
    ans=0;
    for(int i=0;i<=1000;i++)
        {
          ans+=min(a[i],b[i]);
    }
    if(ans==n)
        ans--;
    else
        ans++;
    printf("%d\n",ans);
    return 0;
}
```

Result/Output/Writing Summary:

a. Grid Challenge:

b. Beautiful Pairs:

Learning outcomes (What I have learnt):

a. Learnt about Greedy and branch bound.
b. Got an overview of the implementation.
c. Get to know about crucial test cases.