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Assignment 1
Problem 1:

```
#include <iostream>

using namespace std;

int main()
{
    int a,b; //Defines integers a and b
    cin >> a >> b; //Takes input
    cout << "Original: " << a << " " << b;
    b = a + b; //Changes b to sum of a and b
    a = b - a; //Changes a to sum-a, that is, to original 'b'
    b = b - a; //Changes b to sum-a, that is, sum-(original 'b'), that is, original 'a'
    cout << "\nSwapped: " << a << " " << b;
    return 0;
}
```

Problem 2:

```
#include <iostream>

using namespace std;

int main()
{
    int n,r;
    cin >> n >> r; //Takes input
    r = r<(n-r) ? r:(n-r); //Chooses minimum of r and n-r
    int num = 1, den = 1; //Defines initial numerator and denominator
    for(int i = 0; i<r;i++) //Iterates for loop upto minimum of r and n-r as calculated in 1st step
    {
        num*= (n-i); //Numerator is multiplication from n to (n-min(r,n-r))
        den*= (i+1); //Denominator is multiplication from 1 to min(r,n-r)
    }
    cout << "The value of " << n << "C" << r << " is " << num/den; //Prints output
    return 0;
}
```

Problem 3:

```
#include <iostream>
#include <string>
```

```
using namespace std;
```

```
int main()
{
    int t; //No. of test cases
    cin >> t;
    while(t--){
        string str; //Defines string variable to be taken as input
        cin>>str; //Takes input string
        for(int i=0;str[i]!='\0';i++){ //For loop to iterate through string
            if(str[i]>='A'&&str[i]<='Z'){ //Checks whether given letter is upper case or lower case
                str[i]=str[i]+'a'-'A'; //Changes upper case to lower case
            }
            else if(str[i]>='a'&&str[i]<='z'){
                str[i]=str[i]+'A'-'a'; //Changes lower case to upper case
            }
            else{
                cout << "Please enter only alphabets as input";
                break;
            }
        }
        cout << str << endl; //Prints output string
    }

    return 0;
}
```

Problem 4:

```
#include <bits/stdc++.h>
using namespace std;

struct Student
{
    string name;
    int roll;
    string department;
};
```

```

int main()
{
    vector<Student> data;
    int n; //Number of test cases
    cin >> n; //Taking input n
    while (n--)
    {
        int q;
        cin >> q; //Taking input value either 0 or 1
        if (q == 1)
        {
            Student temp; //creating a struct student if input is 1
            cin >> temp.name >> temp.roll >> temp.department; //Taking input related to that
student
            data.push_back(temp);
        }
        else
        {
            int roll_check;
            cin >> roll_check; //If input is 0, check roll number
            for (int i = 0; i < data.size(); i++) //Iterating through list of students
            {
                if (data[i].roll == roll_check)
                    cout << data[i].name << " " << data[i].roll << " " << data[i].department << endl;
//Giving output of that particular student
            }
        }
    }

    return 0;
}

```