ASSIGNMENT-2

1.

```cpp
#include<bits/stdc++.h>
using namespace std;
int main(){
    int n;
    cout<<"Enter the size of the array: ";
    cin>>n;
    int target;
    int arr[n];
    for(int i=0;i<n;i++){
        cin>>arr[i];
    }
    cout<<"Enter target: ";
    cin>>target;
    int low=0;
    int high = n-1;
    int g=0;
  while(low<=high){
    int mid = (low+high)/2;
    if(target == arr[mid]){
        cout<<"Element found at index: "<<mid;
        g =1;
        break;
    }
    else if(target<arr[mid]){
        high = mid-1;
    }
    else{
        low = mid+1;
    }
  }
  if(g==0){
    cout<<target<<" is not present in the given array";
  }
}
```

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

```cpp
using namespace std;
int main(){
    int arr[] = {64, 34, 25, 12, 22, 11, 90};

    for(int i=0;i<7;i++){
        for(int j=0;j<7-i-1;j++){
            if(arr[j+1]<arr[j]){
                swap(arr[j+1],arr[j]);
            }
        }
    }
    for(int i=0;i<7;i++){
        cout<<arr[i]<<" ";
    }
}
```

```cpp
3(a) #include<bits/stdc++.h>

using namespace std;
int main(){
 int n;
    cout<<"Enter the size of the array: ";
    cin>>n;
    int arr[n-1];
    for(int i=0;i<n-1;i++){
        cin>>arr[i];
    }
    for(int i=0;i<n-1;i++){
        if(arr[0] !=1){
            cout<<"Missing number is: 1";
            break;
        }
        if(arr[n-1] !=n){
            cout<<"Missing number is: "<<n;
            break;
        }
        else if(arr[i+1] != arr[i]+1){
            cout<<"Missing number is: "<<arr[i]+1;
            break;
        }
    }
}
```

```cpp
3(b) #include<bits/stdc++.h>
```

```cpp
using namespace std;

int main() {
    int n;
    cout << "Enter the size of the array: ";
    cin >> n;
    int arr[n - 1];
    cout << "Enter the array elements (sorted): ";
    for (int i = 0; i < n - 1; i++) {
        cin >> arr[i];
    }

    if (arr[0] != 1) {
        cout << "Missing number is: 1";
        return 0;
    }
    if (arr[n - 2] != n) {
        cout << "Missing number is: " << n;
        return 0;
    }

    int low = 0;
    int high = n - 2;
    while (low <= high) {
        int mid = (low + high) / 2;
        if (arr[mid] != mid + 1) {
            cout << "Missing number is: " << mid + 1;
            return 0;
        } else {
            low = mid + 1;
        }
    }

    cout << "No missing number found!";
    return 0;
}
```

4(a)
```cpp
#include <iostream>
```

```cpp
#include <string>
using namespace std;

int main() {
    string s1, s2;
    getline(cin, s1);
    getline(cin, s2);
    string result = s1 + s2;
    cout << result;
    return 0;
}
```

4(b)

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

int main() {
    string str;
    getline(cin, str);
    reverse(str.begin(), str.end());
    cout << str;
    return 0;
}
```

4(c)
```cpp
#include <iostream>

#include <string>
```

```cpp
using namespace std;

int main() {
    string str, result = "";
    getline(cin, str);
    for (char c : str) {
        if (c!='a' && c!='e' && c!='i' && c!='o' && c!='u' &&
            c!='A' && c!='E' && c!='I' && c!='O' && c!='U') {
            result += c;
        }
    }
    cout << result;
    return 0;
}
```

4(d)
```cpp
#include <iostream>

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

int main() {
    int n;
    cin >> n;
    cin.ignore();
    string arr[n];
    for (int i = 0; i < n; i++) {
        getline(cin, arr[i]);
    }
    sort(arr, arr + n);
    for (int i = 0; i < n; i++) {
        cout << arr[i] << endl;
    }
    return 0;
}
```

4(e)
```cpp
#include <iostream>

#include <cctype>
```

```cpp
using namespace std;

int main() {
    char ch;
    cin >> ch;
    char lower = tolower(ch);
    cout << lower;
    return 0;
}
```

5(a)
```cpp
#include <iostream>

using namespace std;

int main() {
    int n;
    cin >> n;
    int a[n];
    for(int i=0;i<n;i++) cin >> a[i];
    for(int i=0;i<n;i++){
        for(int j=0;j<n;j++){
            if(i==j) cout<<a[i]<<" ";
            else cout<<0<<" ";
        }
        cout<<endl;
    }
    return 0;
}
```

5(b)
```cpp
#include <iostream>

using namespace std;
```

```
int main() {
    int n;
    cin >> n;
    int a[3*n-2];
    for(int i=0;i<3*n-2;i++) cin >> a[i];
    int k=0;
    for(int i=0;i<n;i++){
        for(int j=0;j<n;j++){
            if(abs(i-j)<=1) cout<<a[k++]<<" ";
            else cout<<0<<" ";
        }
        cout<<endl;
    }
    return 0;
}
```

```
#include <iostream>

using namespace std;

int main() {
    int n;
    cin >> n;
    int a[3*n-2];
    for(int i=0;i<3*n-2;i++) cin >> a[i];
    int k=0;
    for(int i=0;i<n;i++){
        for(int j=0;j<n;j++){
            if(abs(i-j)<=1) cout<<a[k++]<<" ";
            else cout<<0<<" ";
        }
        cout<<endl;
    }
    return 0;
}
```

```
#include <iostream>

using namespace std;
```

```cpp
int main() {
    int n;
    cin >> n;
    int a[n*(n+1)/2];
    for(int i=0;i<n*(n+1)/2;i++) cin >> a[i];
    int k=0;
    for(int i=0;i<n;i++){
        for(int j=0;j<n;j++){
            if(i<=j) cout<<a[k++]<<" ";
            else cout<<0<<" ";
        }
        cout<<endl;
    }
    return 0;
}
```

5(e)
```cpp
#include <iostream>

using namespace std;

int main() {
    int n;
    cin >> n;
    int a[n*(n+1)/2];
    for(int i=0;i<n*(n+1)/2;i++) cin >> a[i];
    int k=0;
    int mat[n][n];
    for(int i=0;i<n;i++){
        for(int j=0;j<=i;j++){
            mat[i][j]=a[k];
            mat[j][i]=a[k];
            k++;
        }
    }
    for(int i=0;i<n;i++){
        for(int j=0;j<n;j++) cout<<mat[i][j]<<" ";
        cout<<endl;
    }
    return 0;
}
```

```
6(a)
#include <iostream>

using namespace std;

int main() {
    int r,c,n;
    cin>>r>>c>>n;
    int a[n][3],t[n][3];
    for(int i=0;i<n;i++) cin>>a[i][0]>>a[i][1]>>a[i][2];
    for(int i=0;i<n;i++){
        t[i][0]=a[i][1];
        t[i][1]=a[i][0];
        t[i][2]=a[i][2];
    }
    for(int i=0;i<n;i++) cout<<t[i][0]<<" "<<t[i][1]<<" "<<t[i][2]<<endl;
    return 0;
}
```

```
6(b)
#include <iostream>

using namespace std;
```

```cpp
int main() {
    int r,c,n1,n2;
    cin>>r>>c>>n1;
    int a[n1][3];
    for(int i=0;i<n1;i++) cin>>a[i][0]>>a[i][1]>>a[i][2];
    cin>>n2;
    int b[n2][3];
    for(int i=0;i<n2;i++) cin>>b[i][0]>>b[i][1]>>b[i][2];
    int i=0,j=0,k=0;
    int res[n1+n2][3];
    while(i<n1 && j<n2){
        if(a[i][0]<b[j][0] || (a[i][0]==b[j][0] && a[i][1]<b[j][1]))
            res[k][0]=a[i][0],res[k][1]=a[i][1],res[k++][2]=a[i++][2];
        else if(b[j][0]<a[i][0] || (b[j][0]==a[i][0] && b[j][1]<a[i][1]))
            res[k][0]=b[j][0],res[k][1]=b[j][1],res[k++][2]=b[j++][2];
        else{
            res[k][0]=a[i][0];res[k][1]=a[i][1];
            res[k++][2]=a[i++][2]+b[j++][2];
        }
    }
    while(i<n1) res[k][0]=a[i][0],res[k][1]=a[i][1],res[k++][2]=a[i++][2];
    while(j<n2) res[k][0]=b[j][0],res[k][1]=b[j][1],res[k++][2]=b[j++][2];
    for(int x=0;x<k;x++) cout<<res[x][0]<<" "<<res[x][1]<<" "<<res[x][2]<<endl;
    return 0;
}
```

6(c)
```cpp
#include <iostream>

#include <vector>
using namespace std;
```

```cpp
struct Term {int row,col,val;};

int main() {
    int r1,c1,n1,r2,c2,n2;
    cin>>r1>>c1>>n1;
    vector<Term>a(n1);
    for(int i=0;i<n1;i++) cin>>a[i].row>>a[i].col>>a[i].val;
    cin>>r2>>c2>>n2;
    vector<Term>b(n2);
    for(int i=0;i<n2;i++) cin>>b[i].row>>b[i].col>>b[i].val;
    vector<Term>res;
    for(int i=0;i<n1;i++){
        for(int j=0;j<n2;j++){
            if(a[i].col==b[j].row){
                int r=a[i].row,c=b[j].col,v=a[i].val*b[j].val;
                bool f=false;
                for(auto &x:res){
                    if(x.row==r && x.col==c){x.val+=v;f=true;break;}
                }
                if(!f) res.push_back({r,c,v});
            }
        }
    }
    for(auto &x:res) cout<<x.row<<" "<<x.col<<" "<<x.val<<endl;
    return 0;
}
```

7.

```cpp
#include <iostream>
using namespace std;
```

```cpp
int main() {
    int n;
    cin >> n;
    int arr[n];
    for (int i = 0; i < n; i++) cin >> arr[i];
    int count = 0;
    for (int i = 0; i < n; i++) {
        for (int j = i + 1; j < n; j++) {
            if (arr[i] > arr[j]) count++;
        }
    }
    cout << count;
}
```

8.
```cpp
#include <iostream>

using namespace std;

int main() {
    int n;
    cin >> n;
    int arr[n];
    for (int i = 0; i < n; i++) cin >> arr[i];
    int distinct = 0;
    for (int i = 0; i < n; i++) {
        bool repeat = false;
        for (int j = 0; j < i; j++) {
            if (arr[i] == arr[j]) {
                repeat = true;
                break;
            }
        }
        if (!repeat) distinct++;
    }
    cout << distinct;
}
```