

## Week 3 Assignment

1. insertion sort

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

```
int main () {
```

```
    int t;
```

```
    cin >> t;
```

```
    while (t-- > 0) {
```

```
        int n;
```

```
        cin >> n;
```

```
        int arr[n];
```

```
        for (int i = 0; i < n; i++) {
```

```
            cin >> arr[i];
```

```
        }
```

```
        int key, comp = 0;
```

```
        int shift = 0;
```

```
        int j;
```

```
        for (int i = 1; i < n; i++) {
```

```
            key = arr[i];
```

```
            j = i - 1;
```

```
            while (j >= 0 && arr[j] > key) {
```

```
                arr[j+1] = arr[j];
```

```
                shift++;
```

```
                --j;
```

```
            }
```

```
            arr[j+1] = key;
```

```
        }
```

```
        for (int i = 0; i < n; i++) {
```

```
            cout << arr[i] << " ";
```

```
        }
```

2.

```
    cout << "\n shifts = " << shift;
```

```
}
```

```
return 0;
```

```
}
```

## 2. Selection sort

```
#include <iostream>
```

```
#include <iomanip>
```

```
using namespace std;
```

```
int main() {
```

```
    int t;
```

```
    cin >> t;
```

```
    while (t-- > 0) {
```

```
        int n;
```

```
        cin >> n;
```

```
        int arr[n], temp = 0;
```

```
        for (int i = 0; i < n; i++) {
```

```
            cin >> arr[i];
```

```
        }
```

```
        int comp = 0, swaps = 0;
```

```
        for (int i = 0; i < n-1; i++) {
```

```
            for (int j = i+1; j < n; j++) {
```

```
                if (arr[j] < arr[i] && comp++) {
```

```
                    temp = arr[j];
```

```
                    arr[j] = arr[i];
```

```
                    arr[i] = temp;
```

```
                    swaps++;
```

```
                }
```

```
            }
```

```
        }
```

```
for (int i = 0; i < n; i++) {  
    cout << arr[i] << " ";  
}
```

```
    cout << "\n comparisons = " << comp;  
    cout << "\n swaps = " << swaps;  
}  
return 0;  
}
```

~~Quick sort~~

~~#include~~