

Selection Sort

```
int indx, min;
```

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

```
    min = a[pos]; indx = pos;
```

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

```
        if (a[i] < min) {
```

```
            min = a[i];
```

```
            indx = i;
```

```
        }
```

```
    a[indx] = a[pos];
```

```
    a[pos] = min;
```

```
}
```

$$O_b + \sum_{i=0}^{n-2} \left(O_i + \sum_{j=i+1}^{n-1} (O_j + PO_s) \right)$$

$$O_b + \sum_{i=0}^{n-2} \left(O_i + (n-i-1) O_{js} \right) O_j + PO_s = O_{js}$$

$$O_b + (n-1) \left(O_i + (n-i-1) O_{js} \right)$$

$$(n-1)(n-i-1) O_{js} + (n-1) O_i + O_b$$

Take largest
orders of
n

$$\text{let } O_{js} = c''$$

$$O_i = c'$$

$$O_b = c$$

$$n^2 c'' + n c' + c$$

Question 2

Bubble Sort

bool swap;

do {

swap = false;

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

if (a[i] > a[i+1]) {

int temp = a[i];

a[i] = a[i+1];

a[i+1] = temp;

swap = true;

}

} while (swap);

$$O_b + \sum_{i=0}^{n-2} \left(O_i + \sum_{j=0}^{n-1-i} (PO_s) \right)$$

$$O_b + \sum_{i=0}^{n-2} \left(O_i + (n-i)(PO_s) \right)$$

$$O_b + (n-1) \cdot \left(O_i + (n-i)(PO_s) \right)$$

$$n(n-1)PO_s + (n-1)O_i + O_b$$

$$f_{bs}(n) = (n^2 - n)c'' + (n-1)c' + c$$

$$\text{let } g(n) = n^2 \quad \lim_{n \rightarrow \infty} \left(\frac{f_{bs}(n)}{g(n)} \right) = c'' \Rightarrow O(n^2)$$