

### Assignment 3

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#### Question 4

Faster to slowest

Merge

Radix

Insertion

Selection

Bubble

#### Question 5

i) Selection sort

```
public static int[] selectionSort(int[] data){
    int min=0, k=0;
    for(int i=0; i<data.length-1; i++){
        min = data[i];
        for(int j=i+1; j<data.length; j++){
            if(min > data[j]) {
                min = data[j];
                k=j; }}
        if(data[i] > min){ //swap
            int temp = data[i];
            data[i] = data[k];
            data[k] = temp;
        }
    }
    return data; }
```

n = size of the array

time =  $n + n - 1 + n - 2 + \dots + 3 + 2 + 1$

time =  $n(n - 1)/2$

$O(n^2)$

ii) Bubble Sort

```
for(int x=0; x<n; x++) {  
    for(int y=0; y<n-1; y++) {  
        if(array[y]>array[y+1]){  
            int temp = array[y+1];  
            array[y+1] = array[y];  
            array[y] = temp;  
        }  
    }  
}
```

N = size of the array

Time =  $n + n - 1 + n - 2 + \dots + 3 + 2 + 1$

Time =  $n(n - 1)/2$

$O(n^2)$