

Basic Sorting Algorithms

BUBBLE SORT:

```
public class prac1Basicsortingalgo {
    // bubblesort Ascending order sorting
    public static void bubblesort(int arr[]){
        for(int i=0;i<arr.length-1;i++) { // index 0 to n-1( when it goes to
length-1 it brakes )
            for(int j=0;j<arr.length-1-i;j++){ // length-1-i(in first iteration one
big value is sorted so no need to compare before value with it)
                if(arr[j]>arr[j+1]){
                    // if 1st nmbr > 2nd nmbr swap
                    int temp=arr[j];
                    arr[j]=arr[j+1];
                    arr[j+1]=temp;
                }
            }
        }
    }
    public static void Printarray(int arr[]){
        System.out.print( " Sorted array in Ascending order is: ");
        for(int j=0;j<arr.length;j++){
            System.out.print( arr[j]+" ");
        }
    }
    public static void main(String args[]){
        int arr[]={3,6,2,1,8,7,4,5,3,1};
        bubblesort(arr); // function call for sorting
        Printarray(arr); // function call for printing sorted array

    }
}
```

Output:

Sorted array in Ascending order is: 1 1 2 3 3 4 5 6 7 8

```
public class assquest1 {
    // bubblesort descending order sorting
```

```

public static void bubblesort(int arr[]){
    for(int i=0;i<arr.length-1;i++) {
        for(int j=0;j<arr.length-1-i;j++){
            if(arr[j]<arr[j+1]){
                // if 1st nmbr < 2nd nmbr swap
                int temp=arr[j];
                arr[j]=arr[j+1];
                arr[j+1]=temp;
            }
        }
    }
}

public static void Printarray(int arr[]){
    System.out.print( " Sorted array in Desending  order is: ");
    for(int j=0;j<arr.length;j++){
        System.out.print( arr[j]+" ");
    }
}

public static void main(String args[]){
    int arr[]={3,6,2,1,8,7,4,5,3,1};
    bubblesort(arr);// function call for sorting
    Printarray(arr);// function call for printing sorted array

}

}

```

Output:

Sorted array in Desending order is: 8 7 6 5 4 3 3 2 1 1

SELECTION SORT:

```

public class prac1Basicsortingalgo {
    // selection sort Ascending order sorting
    public static void Selectionsort(int arr[]){
        for(int i=0;i<arr.length-1;i++){// index 0 to n-1
            int minpos=i; // 0==minpos
            for(int j=i+1;j<arr.length;j++){ // i+1 to n
                if(arr[minpos]>arr[j]){
                    minpos=j;
                }
            }
            // swap arr[i] and arr[minpos]
        }
    }
}

```

```

        }
    }
    //swap
    int temp=arr[minpos];
    arr[minpos]=arr[i];
    arr[i]=temp;
}
}

public static void Printarray(int arr[]){
    System.out.print( "selection sort in Ascending order is: ");
    for(int j=0;j<arr.length;j++){
        System.out.print( arr[j]+" ");
    }
}
public static void main(String args[]){
    int arr[]={3,6,2,1,8,7,4,5,3,1};
    Selectionsort(arr);// function call for sorting
    Printarray(arr);// function call for printing sorted array

}
}

```

Output: selection sort in Ascending order is: 1 1 2 3 3 4 5 6 7 8

```

-----
public class prac1Basicsortingalgo {
    // selection sort descending order sorting
    public static void Selectionsort(int arr[]){
        for(int i=0;i<arr.length-1;i++){// index 0 to n-1
            int minpos=i;// 0==minpos
            for(int j=i+1;j<arr.length;j++){ // i+1 to n
                if(arr[minpos]<arr[j]){
                    minpos=j;
                }
            }
            //swap
            int temp=arr[minpos];
            arr[minpos]=arr[i];
            arr[i]=temp;
        }
    }

    public static void Printarray(int arr[]){
        System.out.print( "selection sort in Descending order is: ");
        for(int j=0;j<arr.length;j++){

```

```

        System.out.print( arr[j]+" ");}
    }
    public static void main(String args[]){
        int arr[]={3,6,2,1,8,7,4,5,3,1};
        Selectionsort(arr);// function call for sorting
        Printarray(arr);// function call for printing sorted array

    }
}

```

Output:

selection sort in Descending order is: 8 7 6 5 4 3 3 2 1 1

INSERTION SORT:

```

public class insertionsort {
    public static void insertionsort(int arr[]){
        for(int i=1;i<arr.length;i++){
            int curr=i;
            int prev=i-1;
            while(prev>=0&&arr[prev]>arr[curr]){
                arr[prev+1]=arr[prev];
                prev--;
            }
            arr[prev+1]=arr[curr];
        }
    }

    public static void Printarray(int arr[]){
        System.out.print( "selection sort in ascending order is: ");
        for(int j=0;j<arr.length;j++){
            System.out.print( arr[j]+" ");}
        }
    public static void main(String args[]){
        int arr[]={2,4,5,6,7};
        insertionsort(arr);
        Printarray(arr);
    }
}

```

```
}  
insertion sort in ascending order is: 2 4 5 6 7
```

Inbuilt Functions:

```
import java.util.Arrays;  
public class Inbuiltsorts {  
    // java contains inbuilt sorts named (util.Arrays) module first we need to  
    import it by import java.util.Arrays  
    public static void Printarray(int arr[]){ // function for printing the sorted  
    array  
        for(int i=0;i<arr.length;i++){  
            System.out.print(arr[i]+" ");  
        }  
    }  
    public static void main(String args[]){  
        int arr[]={2,6,4,3,5,1};  
        System.out.print("sorted array :");  
        Arrays.sort(arr);// SORT function  
        Printarray(arr);//function call  
    }  
}
```

```
}  
Output: sorted array :1 2 3 4 5 6
```

//sorting inbetween array

```
import java.util.Arrays;  
public class ascendingInbuiltsort {  
    public static void printarray(int arr[]){  
        for(int i=0;i<arr.length;i++){  
            System.out.print(arr[i]+" ");  
        }  
    }  
    public static void main(String args[]){  
        int arr[]={3,5,7,2,1,8,4,9,6};  
        // we can sort array inbetween also by passing startung index and ending  
        index in Arrays.sort()
```

```

        Arrays.sort(arr,0,5);//sorting from 0th to 5th index
        printarray(arr);

    }

}

```

Inbuilt functions (descending order)

```

import java.util.Arrays;
import java.util.Collection;// for descending order we need to import
java.util.collections(library)
import java.util.Collections;
public class descendingInbuiltsort {
    public static void printarray(Integer arr[]){
        for(int i=0;i<arr.length;i++){
            System.out.print(arr[i]+" ");
        }

    }

    public static void main(String args[]){
        Integer arr[]={3,5,2,4,1,8,9,6};// for collections library we use
Integer(instead of int)
        Arrays.sort(arr,Collections.reverseOrder());
        printarray(arr);

    }

}

```

Output: 9 8 6 5 4 3 2 1

Sorting inbetween array

```

import java.util.Arrays;
import java.util.Collection;// for descending order we need to import
java.util.collections(library)
import java.util.Collections;
public class descendingInbuiltsort {
    public static void printarray(Integer arr[]){

```

```

        for(int i=0;i<arr.length;i++){
            System.out.print(arr[i]+" ");
        }

    }

    public static void main(String args[]){
        Integer arr[]={3,5,2,4,1,8,9,6}; // for collections library we use
        Integer(int) instead of int
        Arrays.sort(arr,0,3,Collections.reverseOrder());
        printarray(arr);

    }

}

```

Output: 5 3 2 4 1 8 9 6

Counting sort:

Ascending order:

```

public class countingsort {
    public static void countingsorts(int arr[]){
        int largest=Integer.MIN_VALUE;
        for(int i=0;i<arr.length;i++){
            largest=Math.max(largest,arr[i]);
        }
        int count[]=new int[largest+1];
        for(int i=0;i<arr.length;i++){
            count[arr[i]]++;
        }
        //sorting
        int j=0;
        for(int i=0;i<count.length;i++){
            while( count[i]>0){
                arr[j]=i;
                j++;
            }
        }
    }
}

```

```

        count[i]--;

    }
}

public static void printarray(int arr[]){
    for(int i=0;i<arr.length;i++){
        System.out.print(arr[i]+" ");
    }

}

public static void main(String args[]){
    int arr[]={2,3,4,2,3,4,5,6};

    countingsorts(arr);
    printarray(arr);

}

}
Output: 2 2 3 3 4 4 5 6

```

Descending order:

```

public class countingsort {
    public static void countingsorts(int arr[]){
        int largest=Integer.MIN_VALUE;
        for(int i=0;i<arr.length;i++){
            largest=Math.max(largest,arr[i]);
        }
        int count[]=new int[largest+1];
        for(int i=0;i<arr.length;i++){
            count[arr[i]]++;
        }
        //sorting
        int j=0;
        for(int i=count.length-1;i>0;i--){
            while( count[i]>0){
                arr[j]=i;
            }
        }
    }
}

```



```
        j++;
        count[i]--;

    }
}

}

public static void printarray(int arr[]){
    for(int i=0;i<arr.length;i++){
        System.out.print(arr[i]+" ");
    }

}

public static void main(String args[]){
    int arr[]={2,3,4,2,3,4,5,6};

    countingsorts(arr);
    printarray(arr);

}

}
```

Output: 6 5 4 4 3 3 2 2