## Algorithm Lab Tasks

1. Bubble sort Package com.company

class Bubblesont

roid bubblesont (inta[])

intn=a.length;

Jor (inti=0;iln-1;i++)

for (intj=0; jln-i-1, j++)

if (a[j] > a[j+1])

 $\begin{array}{c} \text{int flag = a tij;} \\ \text{a[i] = a[i+1];} \\ \text{a[i+1] = flag;} \\ \text{} \end{array}$ 

Void print Array (int x[])

{ int n = x. length

for (inti=0; i(n; ++i))

} ystem. out. print(x[i]+");

```
system.out.prientInl);
         Public static void main (string args [])
           Bubble sort ob = new Bubblesont ();
int array [] = {12.8,7,5,2};
               ob bubble sont (array);
            System · out · prientin ("SORTED ARRAYS");
               Ob. print Annay ( array);
     Bubble sort Algrorithm:
        worst case personnais o (n/2)
 Best case penformance o(n), Average case penformance o(n^2)
 tod it towers " Verent by & continue
```

2. Linear Search 11/100 Package com. company ( ) class Linear sparch Public static int search (into [], intx) fint n=a.length; for (inti=0; i(n; i++). ?if(ari) ==x) return i; 2 saddingela has summer return - 1; Public static void main (string args[]) Pint x[]= \$5,25,90,24}; int v=90; int result = search (x,v); if (result ==-1) system. out. prient (" Element is not available in array");

else

system. out. prient ("Element found at index"
+ result);

Linear Search Algorithm

borst case performance O(n)

best case performance O(1)

Average case performance O(n)

3. Insertion sort

Package

com. company

import Jara util Annays;

etass Insertion sont {

void insertion sont (intarray [))}

int size = array length;

for (int step = 1; step Lsize; step+)}

int key = array [step];

int j = Step-1;

while (j >= 0 && key Larray (j))}

array [j+1] = array [j]; 4 5 a 14 hough - 1-3 5 11" \ long to large with the array[j+1] = key; Public static void main (String args (2)) int[] data = {9,5,1,4,3} Insention sort is = new Insention Sort(); is insertion sort (data); System out prientln ( "sorted Annay in Ascending order ; "); system out . prientln (Array to string (data) 1 start fright new forten 3 tressenting to sent Insention Sout Algorithm worst case personnance o(n2) Best case personnance o (n) Average case performance 0 (n2)

```
4. selection sort
    Package
    com. company;
               import, Java util scanner;
Public class selection

? public static void main (string argst)
             Fint size, 1, 1, temp i
    int orre[] = new int [50];
               scannen sean = new scannen (system.in);
            System · out . prient ("Enten Annay size");
               Size = Scan next Int ();
           system. out. prient ("Enter Array Elements:)
              for (i=0;iLsize;i++)
        Sarcre (i) = Scan next Int ();
      system out print ( sonting Array wring
                selection sort Technique. \n");
                for (i=0; i Lsize; i++)
                   Sfor (j=i+1; j (size; j++)
                      3 if (ann[i] ) ann[j])
```

femp= anntizi arr[j]=temp; i mars of the sear bright System. out. print ("Now the Annoy after Sorting, is: \n");

Sor (i=0; ilsize, i+t) Egystem. out. prient (arre[i] + "); Carrie pour A religible from the colores statut pour touter House these makes selection Sout Algorithm worst case performance O(n2) Best case performance 0 ( n2) Average case performance O(n2) Cake manufact burn entrates

```
5. Binary search
  class Binary search Example }
  public static roid binary search (intarre[], int first
     int mid = (first + last)/2;
   while (first L= last) {
       if (arrtmed) L key) {
        first=med +1;
} else if (arr[med] == key) {
  System. out. Prientla (* Elements is found at index
   break ;
3 else }
    ( last = med - 13
  mid = (first + last)/23
     } it (first > last) }
     system. out. preintin ("Flement is not found!);
Certification of the sent time
    Public Static Void main (Strong angs[)}
           int ann[] = {10,20,30,40,507;
```

int last = ann. length - 1; binary search (arr, o, last, key); cheer throng or and and Binary search Algorethem: worst case pentonmance o ( logn) Best case persformance o(1) Average case performance of (1091) 6. Menge Sont Public class My Mengesont Proidmenge (intant), int beg, int med, int 1 = med - beg +1; int n = end - med; int Left Array [ ) = new int [ 1]; int Right Annay [] = new int [m]; for (inti=0;iL1;++i) Left Annay [i] = ann [beg +i]; for (int j=0; j Ln; ++j)

Pight Annay [j] = ann [mid+1+j];

inti=0, j=0

int K=beg;

while (i L1 && j Ln)

```
if here to him own blood
    3 if (lest Annay [i] L= Right Annay (i))
  Sanntk) = lest Armay [i];
farrex]=Right Armay [i];
il ilipat; bong box astops
         2 while (JLR)
fannt W= Right Annay [j);
j++;
      Canal & VK++i
           void sont (int ann[), int beg, intend)
           3 if (beg L end)
           ? int mid = ( begtend )/2;
             sort (arribeg, mid);
```

Sort (arer, mid+1, end); menge (annibeg, mid end); Public static roid main (strieng args[]) firtannt] = {90,23,101,45,65,23,67,89,34, My Merge sont ob = new My Merge sont (); ob. sort (ann. o, ann. length - 1); system. out. prient In ("In sonted array"); Son (inti=0; i Lann. length; i++) Esystem. out. print (ann\_[i]+""); Time complexity of menge sont is (not logn) in all the 3 cases lacestheir barretail has his

```
7. Buier sont
     Public class Quiex sont {
     Public static roid main (Strain [) args){
     int[] ann= 190,23,101,45,65,23,67,89,34,23);
       quecksont (ann 0,9);
      system. out print In ("In the sorted array
(1) is: \n");
       Jon (1=0; 1210)1++)
        system. out. prientin (arr [i]);
        public static int partition (intat), int
                      beg; intend)
        int left, right, temp, loc, flag;
            loc = lest = beg;
              right = end;
             flog=0;
             while (flag! =1)
             Swhile ((at 10c) (= a [reight]) & (loc!=
reight)
   1 (loc = = rieght)
    flag = 2;
```

```
elseib(a[loc]>a[right])
    otioe]=atreght);
        a rright) =temps
coc = right;
        ? I Congress houses
if (flag!=1).
        swhite ((a[10e]) =a[lest]&&(10c!=lest))
      if (100== 65+)
flag=1;
else if (at loc] La [lest])
   Stemp 20 [10c];
            attocle at lest];
             a [lest] = temp;
             loc = lest;
            513 100 110 Miles
1900 2 (Floring 15 3) (14 (5)), 18 16 6
           retorn toe;
     Static void quecsont (intat) int bes; int
                             erd)
```

3 int loci if (beg Land) Floc=paretition(a, bog, end); quecksont (a, beg, loc-1); queksont (a, loc+1, end); Quick Sort Algorith. worst case personnace o(n2) Best ease penformace o(n) Average case performance o (n logn)