1. Bool search (int or C3, int trajet) {

int R= or. Lize(1);

for (int d=0; ick k, ict + 1) {

if (apoci) == k) {

peter true;

else if for Cil > k) {

break,

3

3 soften false;

3

```
Void investin ( int oras 2), int m)
        for ( it i=1; i < n-1; i+1)
            Kroncij,
           -jzi-1; () as 12 m = 91 toi
           while (jszo 23 KLOOK[i])
                amcituz amcijij
            (-- Cetter tous
             3 om Ci+13 = k; 1 32/9
Reunize
1 void imetion (int or []; inter []
        ib(14/2 1) {
             Jetun!
        inestion (orr, n-1);
         jut late arch-1);
        inti = h-2;
```

```
unile (1) >= 0 & & or (1) > lat) {

arrive a
```

2

doesn't wait for the west to entry algorithm or it state softing element or soon or the first element in entered while atte rooting technique which work on full data while atte rooting technique which work on full data

\$ [4 = 75] 2 [4]

3. conflocity of soste

	Best	overage	workst
E Bubble	o(n1	an21	OCH21
+ Imestion	O(n)	0(112)	0(12)
is selection	0(12)	0(12)	0(n2)
Merge	O(nlogn)	O(nlogh)	o(n)ogn)
anick	0(12)	O(nlogh)	o(nlogn)
	o(nlogn)	o (nlogn)	o (nlogh)
court	O(n+k)	o(h+k)	0 (N+12)
4. In-place sorting online sorting stable sorting			
= unetion sort > zmestion sort			
-) Bubble soxt 1, Bubble soxt			
- Selection sout - mage sout			
+ inestion sost			
+ Heap sort			

```
5. intrative
  int Binony ( int arr [], int R) {
     ind l= 0;
    int h = am. cizell-1;
    while ( IL= MI &
  jut midz 1 + (n-11/2)
Fb (on [mid] = = k) {
else 16 ( omcmd] < K) {
                         go prosided
        lz midfl;
         che &
                                 300
                                 Holts.
         Fin n= mit/j
                          FRICE
       was a
                (Molaso)
                         (Melh)O
       0(11)311
                (460 M)
   Jehm-li
                          CATED
   T. C= of logn) later of the said in a
 S. C= O(1)
                        the notes set
```

SI

troe mitaries

```
secusive
         Binonylist onc], intl, intr, int key
 6001
          ib(1)01:
                setion yake;
          ind mid = 1+ (2-1)/2,
            16 (or [mid] = = key)
                   Jetish tru;
           elee ib (on [mid] > ky)
                  Brosy (aso, e, mid-1, ky);
            Binny Low, midtl, o, keyl;
```

6. The sewmence selation for binary sewes the reach can be expressed or T(n|z+(n/z)+o(1))

6 According to me quicksort in best for practical use or it is considered one of the fastest hosting algorithms for average and typical casen. Its any case time complexity in orningal and worst use in orning but it rasely occurs in the prot element in chosen randomly every time and also it doesn't require any excha memory

7. In an array, an inverse ion occurs when two elements are out of their sorted order.

foreg: Comider on averay A, if there are two indical and j such that it j and ACI] > ACI], then the pair (ACI), ACI] forms on invession

Counting inversion using merge sort! -

- int meggesost (int or [], int tempe], int l, intr)

int mid, inv=0;
ib(0>e) & 11-binv=00) stills

mid = (+1)/2/, 1.

inv = inv + meggesort (arr, temp, l, traid); inv = inv + meggesort (arr, temp, mid+1, s); inv = inv + merge (arr, temp, l, mid+1, r);

deturn invj

3

```
int marge (Int arrE), int tempE), intel, int mid, intr)
2005 representation to price B. I stong alt for one I returned so
produce creek ini, ki, i, k, see some suitet de-
  and introduced introduction of any dear de
the profession of the character of the delice of the
           it tourne sugue of a conjunction is
mhile (Liz=m1d-1) 88 (jz=8)]{
                 if (anti) <= onis)
 pemp[k++]=anci++];
  my all wall it is and ASI >A COI, then the party
                  else Essel se englilling (17A (17A)
                       temp[k++]= anci++];
                        inv = inv + (mid-c);
         at mange cot ( int in () int my (), int confession to
                      int mid., invel;
             while (ic=mid-1/2 000)di
                  temp[k++]=oncit+],
  · Chart & Among The Design + VIVI - Wini
while (j <= 2/ 2
 temp[k++] = onci++];
              borl i=l; ic=r; i+12
                      anci]=tempcij;
              often inv;
```

int mesges C int or [], int size)

[int temp[size];

setum mesgesat (asr, temp, 0, or size-11;

8. The Best Care scenario for quick Cost is when the chosen pivot element divides the orang into two approximally equal holfer. (T.C = O(nlogn1)

As for the worst care round is when the chosen pivot element divides the army into 2 wabalanced halver. (T.C = O(n4));

9 Mesge sort + Best Care = T(n/= 2T(n/21 + O(n))
Worst Care = T(n/= 2T(n/21 + O(n))

Quick cost + Best love = T(n/= 2T(n/2)+O(n) Worst love = T(n/= +(n-1)+O(n)

Simillosities

- -) Both the sorting olyon Hum works on divide and conqueous strategy.
- -1 Both algorithms have best core and worst care time complexity or o(hlogn)

(FIZMEN) CO CHANGED

Diffsence: Merge sort in more efficient on lorge orrays while quick soft most efficiently on smaller stood some sometiment (and , temps :- Mege sost equise addittional space propostrans to the size of the input army, while quick sort in an in-place testing technique which means it dozent require away octra space making it more memory efficient Clubolado - 277 ... c To C - O Carlogal) 12. Stable version of relation sort: void selection (int om []) } int nz or sitelli=0; Medde corp - 0 0 for (iz=0; ikn-1; i++1 & int minzi; bor Ciut j= C+1; j ch; +tj/{ ib (arcisz arcmins) { to the the citization without one district 3 Particles charted. E sole algoritume have bet western work was int m= arcmin]; while (min >1/2 comemin = orcmin=13; min--,

on CD= m;

13. Modified vession of bubble sost that can sender the problem in:

void bubble (int ar (]) {

int n= arr.size(1, i=0, j=0)

bool sunpe;

bor (i=0; i(n-1; i+1){

sunpe=bolos;

bor (i=0; i(n-1-1; i+1){

ibl arr (i) > arr(i+1)){

sunp(arr(s), arr(i+1));

sunpe=true;

2

ib C 1 Sulape 1 2 break];