

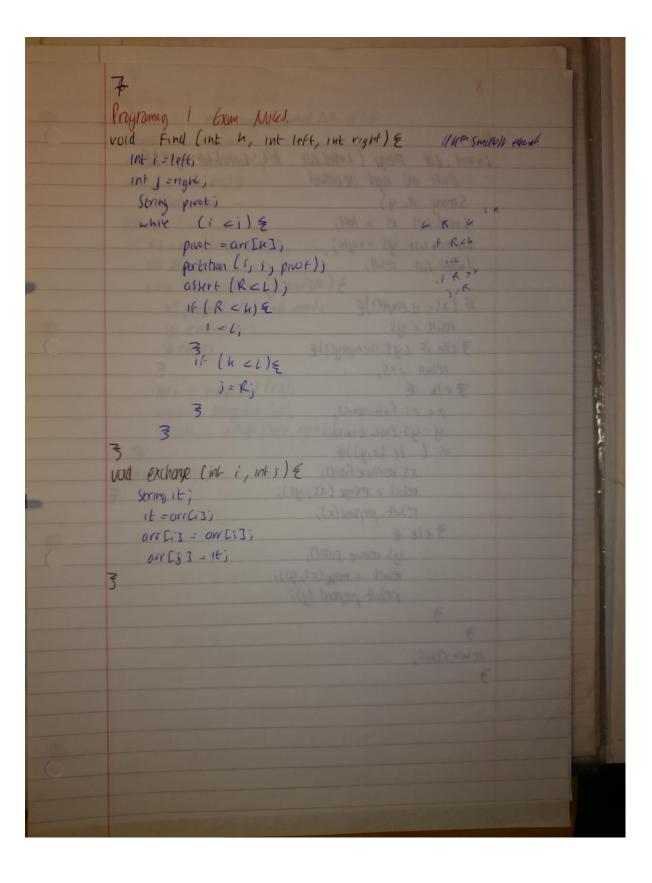
INFORMITON SYSTEMS public void inlest (String Stv, mt pos, int low, in high) {
For (int K=high+1; K7ps; K-1){ arr Cu3 = arr Cu-13, arcyos] = Sv 3 /led public vail intert-sort (int low, ind high) & for (int K= lax+1; K = high; K++) ? search (low, K-1, arr [K]);
Insert (arr [k], Index+1, low, k-1); 3kno

Prigramy 1 Excen Noble Motrix Soddle pool prof: Any two soddle power in a zero sum mornix must hap the some volve Proof Suggest a and b are bus suddle point in a matrix If they le in the same ray, then since an the smullest entry in its row a = b; but since bis old to Smollest enty m 18 row b=a. So o=b Similarly, if they be in the same column, both one the lamely in the column, so both are and 679 Se a= b. If they lie in a different row and column, then they form opposite comes of a rectangle in the motivity let c and d be be other than corner their relative position in the morn both his a c Since as the smullest only in its now any but largest in It's ldum, we have $a \leq c \leq b$. But then $b \in V$ the Smallest enly in its now and a the largest in its column to b d = a. But since the some number 11th Ut Noting thek inequally light acceded But Since the Same number litt or both and at In equipy, all 4 number must in four be equal. And So but he only does a b, but that could are with

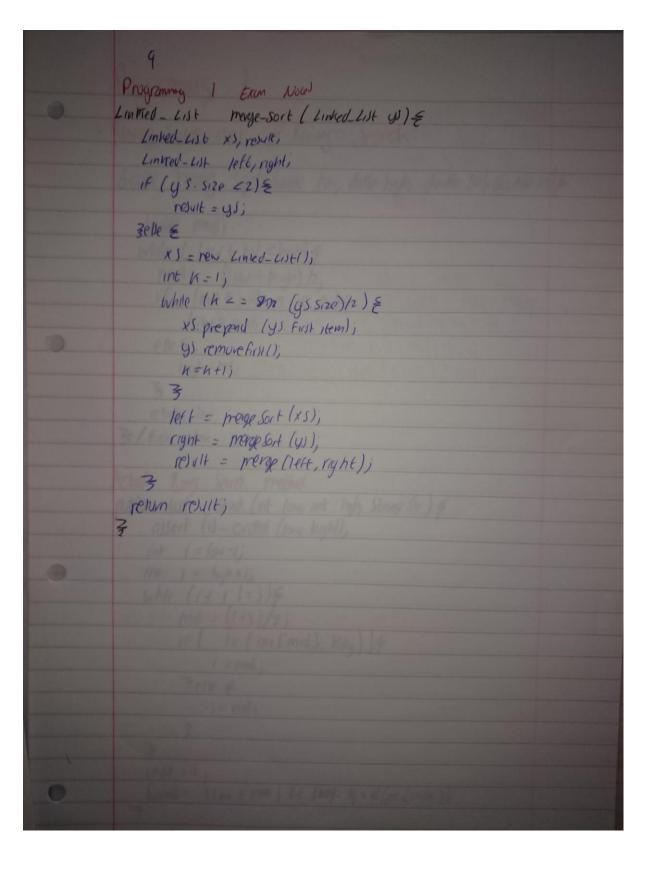
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4
Marrix (Justes
public
       Basic_Matrix transpose() &
 Basic-Motrix result = new Basic-Matrix (cols, rows);
 for (Int i =0, i = (015; i++) &
        for (int j = 0; jerows; j++) &
        result mot [i][s] = mot [s][i])
  return relult;
int min-index (double overs) & int max-inux (date overs) &
int result = 0;
    double min = arr [0];
                                           max = aricol
  For (int K=1; K = arr. length; K++) {
                                          " byis 31
   if (arrch] < min) =
                                         IF CONCES THEX &
            mn =arr[k];
                                          mox=ovicki)
            result = k;
                                          resultan;
  return reult;
double [] min-row() &
                        dable () mox-rou () {
   doubelirouti
     double [] row_k;
    result = now double [rows].
     for (int K=0; K < rows; K++) {
     row_k = mat [k]
        result [h] = row_h[min_inclex(row_k)] resulth 3-row h[mx min_s]
    return repulti
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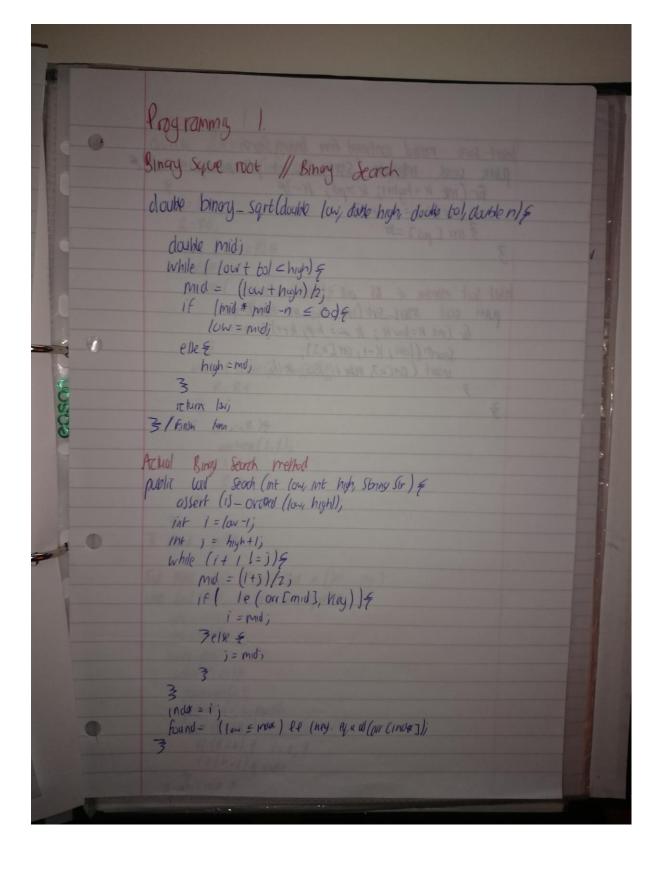
Programmy I Gram Nobel void one-sadde (Bosic-Matrix m) { daille Dmirsen; 3 (the province at the stand of the double C3 maxs; int mn, mx; Basic matrix mt; mins s m.min-rowll; Mt = m. tronspoxe(); muxes = mt. max-row(); mn = m. max_index (mins); my = m.min_index (motel); if [mins [min] = = modes [mx]) { print_Soddle (m.mot, mn, mx); 3 814 8 "No sudde pont" will all-Soddle (Bosic-Morrix m) { double Gimin, Gimores; boolean found = falle; Bodic motrix mt; mins = mn.min-row(); mt = m. tron)p-4 moxes = mt. mox-rov(); for (Int i=0, i zm.rows; i++)E for (int K=0; K < m. (015; K++) } if (min SEI] = mox SEI]) { found = tice; 3 Prat-Sudde (m. mot, i, i); if (!fown) & pror for "}

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LAIFMENATUN SYSTEMA
          6
  Quicksat
  vord goort (Int left, int right) &
      String pivot;
      Int 1,5;
      prot = arr [ (left+rright)/2];
      partition (left, right, pint);
      1=L;
      If (i = right) = q sort (left, j); 3
 vaid partition (Int 20, Int RO, String p) €
      L= LO;
      R=RO;
      while (L == R) {
            while (It (arill], p)) = 1/left San
                composit;
                L= L+1;
            while (It (p, arrER3)) & //right Scon
             complett;
             R=R-1;
           comps ++;
           IF (LER) &
             exchange (L,R);
             exint+;
             L= L+1:
             R=R-1;
3 /land pultiv
```



Morge both Linked - List merge (Linked-List left, Linked-List right) & Met and right or ordeal String X, y; Linked-4st xs = left; Linked-List 45 = right; Linked-List result; If (xs. is-emptl)){ result = ys; 3 else if (ys, isempty()) { reluit -xs; 3 ele € X = XS. FIRST-HEML); y=ys.first item(); 1 (1e (x,y)) { XS. remove firstl); result = merge (xs, ys); result. pepano(x); 3 11 8 ys remove AISt(); result = page(xs, ys); result prepared (y); return relult;





Insert sort mornal continued from brung search

Public world insertage. ('String str, int pos, int log int high) a

for (int k = highti; k >ps; k--) =

arr [k] = arr [n-1];

3 arr [ps] = str Intert Sort extention of BS and Insight for (ink M=low+1; M == hip; K++) = Search (low; K-1, on [h]);
insert (anch], white, low, k-1);

3

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Programmy 1
QUICK SURT METHOD
void partition (int 20, int RO, sorry p)
     L= LO;
     R=RO;
     While (L <= R) &
        Mest son
        While ( ISStanCarr[13, p) &
            (omp=(omps+1
             L=L+1
        while ( lesslon (p, artR]) {
         R=R-1
       if (L Z= K) &
             excharge (L,R);
              R-R+1
 3 Herd portion
 Find Maked fines him smaller flower in [let ... righ]
 vad find link, lit left, mt ngit) &
     mt i =lefti
     Int j=rzynt)
     Strong pluti
      while (ici) &
        pivot = orr [u];
        prtitor (i, i, plust),
         assert (RCL);
          It (RCK) & i= L; 3
if (hcl) & T=R;
     3 If INUX A
```

Quansort method void quet (int lett, introphi) =
string proofi
int i, i; prot = arr [(left+rynt)/z]; partion (left, right, prot); It (left <j) \{ q brt (left, j) \}

If (i < right) \{ q goodli, right !}