CS4321 QUIZ 4 (Nov. 16)

NAME (5 points):

We are going to sort array T[8] = {10, 5, 11, 9, 13, 7, 20, 1}.
1. (3 points) If we use quicksort, show the content of array T after first time pivot(), i.e., pivot(T, 0, 7), is called. What value does it return?

2. (2 points) If we use the bottom up version of mergesort, show the content of array T after the "while" loop finishes the second iteration.

```
int pivot(T, i, j)
{
  // choose T[i] as the pivot
  p = T[i];
  l = i;  // left cursor
  r = j+1;  // right cursor
  do {
    l++;
  } while (T[l]<=p and l < r)

  do {
    r--;
  } while (T[r] > p);

  while (l<r) {
    swap(T[l], T[r]);
    do {
      l++;
    } while (T[l] <= p);
    do {
      r--;
    } while (T[r] >  p)
  }
  swap(T[i], T[r]);
  return r;
}
```

```
mergeSort(T[n])
{   int len = 1;
    boolean direction = true;
    int U[n];

    while (len < n) {
       for (i=0; i+len<n; i+=2*len) {
          if (direction)
             merge(T[i..i+len-1], T[i+len, min(n-1, i+2*len-1)], U[i]);
          else
             merge(U[i..i+len-1], U[i+len, min(n-1, i+2*len-1)], T[i]);
       }
       direction = !direction;
       len * = 2;
    }
    if (direction)
       copy(U,T);
}
```