# Solutions to Re-Exam 2018 Exercises

## Exercise 1

**1.1 c**
$\lg n + n + \mathbf{n^2}$

**1.1 c, d**

**2.1 c**
**2.2 a**

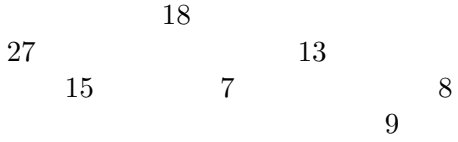
**3 c, d**

**4 d: 3, 5, 7, 9, 8, 2, 1, 10**
After 1st Merge: 3, 7, 5, 9, 8, 2, 1, 10
After 2nd Merge: 3, 7, 5, 9, 8, 2, 1, 10
After 3rd Merge: 3, 5, 7, 9, 8, 2, 1, 10

**5 d:** `empty, 10, 2, 3, 11, 95, empty, empty, 8`

**6 c)**

**Ex. 2** T looks like the following:




Pre-order tree walk on T: 18, 27, 15, 13, 7, 8, 9

**Ex. 3** Always insert into a new integer in front of the head pointer and then make the head pointer points to the new integer. Remove the integer that is pointed by the head pointer. Both operations are constant time $\Theta(1)$.

$5 \to 15 \to 10$, where head points to 5.

**Ex. 4** Directed, un-weighted graph. users are vertices. If $U_i$ follows $U_j$, we have a directed edge from $U_i$ to $U_j$.
Run BFS, and return all vertices in the BFS tree at the $k$-th level.
$O(V + E)$.