Week 10 Assignment

1. Design an algorism for a hungary person with diet restriction and calories conscious.

1. make a list of all items on menu, call it "menu"
2. Loop through the list, remove all items that can not eat due to diet restriction
3. Sort the elements in the list by most calories to least calories.
4. make a new empty list, call it "order."
5. try to add the first item in the "menu" to "order" until reach the Calories limit.
6. try to add the second item in the "menu" to "order" until reach the Calories limit.
7. repeat, until reach the last item in "menu"
8. return "order"

2 Sort {65, 10, 85, 28, 33, 74, 67, 56, 31, 62, 45, 24} by

1. Bubble sorting

2. Selection sorting

3. Insertion sorting

Bubble sort (smallest to largest):

1 {65, 10, 85, 28, 33, 74, 67, 56, 31, 62, 45, 24}
65>10, switch

2 {10, 65, 85, 28, 33, 74, 67, 56, 31, 62, 45, 24}
65<85, pass

3 repeat ..., then {10, 65, ..., 85} ← the largest will be move to the last index of list

4 repeat step 1, 2, until the list being sorted (need to repeat number of elements of times at most)

5 the list is sorted

Selection sorting (largest to smallest):

1 {65, 10, 85, 28, 33, 74, 67, 56, 31, 62, 45, 24}
max from [0, -1]
last index

2 {85, 10, 65, 28, 33, 74, 67, 56, 31, 62, 45, 24}
switch first and max

3 {85, 10, 65, 28, 33, 74, 67, 56, 31, 62, 45, 24}
max from [1, -1]

4 {85, 74, 65, 28, 33, 10, 67, 56, 31, 62, 45, 24}
switch second and max

5 repeat until reach the end of the list

6 the list is sorted

Insertion Sorting (smallest to largest)

1 {65, 10, 85, 28, 33, 74, 67, 56, 31, 62, 45, 24}

2 {65, 10, 85, 28, 33, 74, 67, 56, 31, 62, 45, 24}
list 1 list 2
make first element a new list

3 {10, 65, 85, 28, 33, 74, 67, 56, 31, 62, 45, 24}
list 1 list 2
move index 0 from list 2 to list 1, and find a suitable index of it from left to right.
(10 is smaller than all elements in list 1, so it goes to index 0)

4 {10, 65, 85, 28, 33, 74, 67, 56, 31, 62, 45, 24}
list 1 list 2
keep doing that
(85 is larger than all elements in list 1, so it goes to index -1)

5 {10, 28, 65, 85, 33, 74, 67, 56, 31, 62, 45, 24}
list 1 list 2
(10 < 28 < 65, so put 28 between 10 and 65)

6 repeat until size of list 2 become 0

7 the list is sorted