Solutions to Review 07

(for reference only)

Topic: Hash Table Data Structure

1. What is a hash table?

   Refer to Page 307 in the textbook.

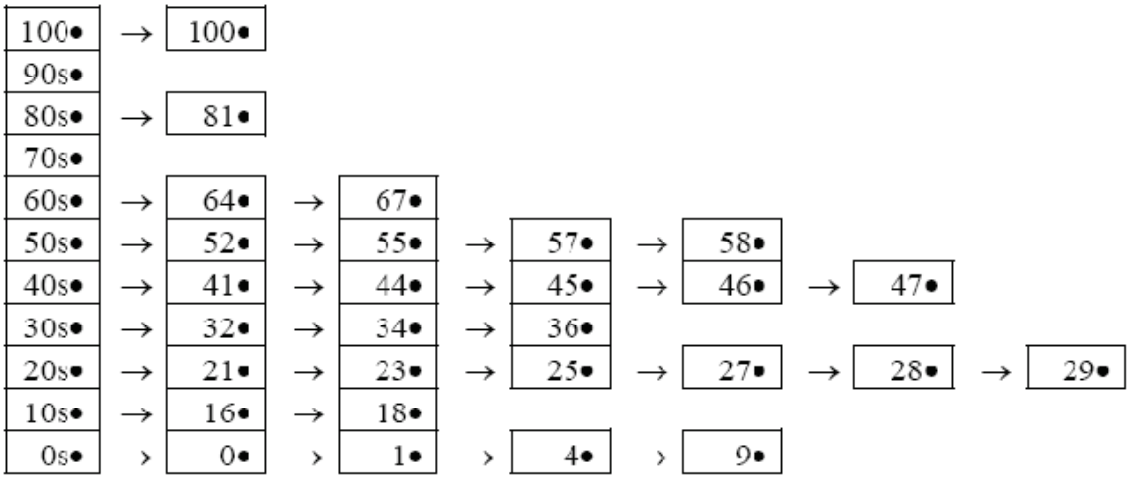
2. What is the difference between CBHTs and OBHTs?

   Refer to Pages 309 and 316 in the textbook.

3. True or false: Clustering is associated with CBHTs.

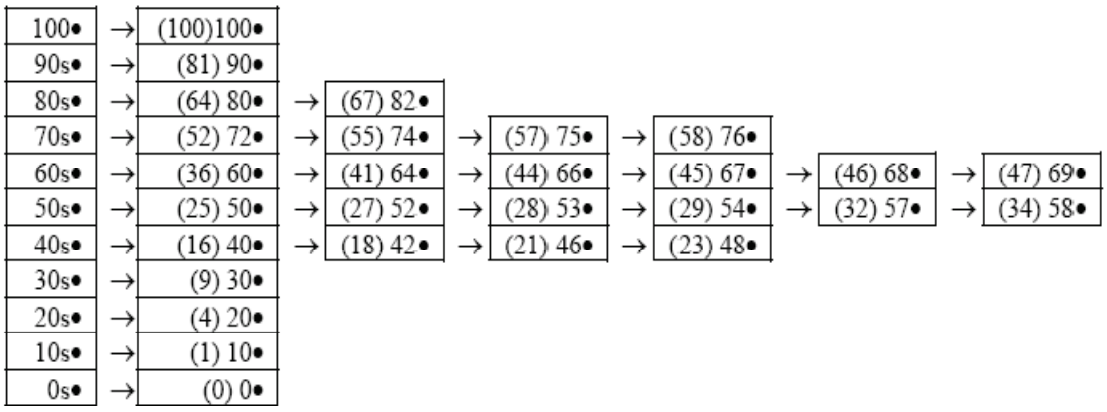
   False.

4. Suppose the following CBHT represents student exam results. More than 50% students would fail this unit based on this list. The coordinator decides to use a non-linear function to scale up the scores so that the 100 stays the same whereas the 25 and higher should pass 50. Please devise a suitable and uniformed hash function to realize this non-linear scale-up, and use it to redistribute the list.



First step: using the following hash function to scale up the marks:

```
Hash(elem) = Round[10×SQRT(elem)]
```



Second step: using the following hash function to assign each scaled mark into its home bucket:

```
Hash(scaled_mark) = 10 - Int[scaled_mark/10]
```