**Mission College**

Department of CIS

Advanced Python Programming (CIS 008) – Midterm Preview (30 points) **Answer All Questions**

Time: 120 minutes

Grabbed the text from the zoom meeting and wrote a summary for each question

Questions on Classes 1 - 7:

Q1 [7 pts]: Be familiar with the map()/dict(), sort() functions, and lists data structure.

1. Basically i'm going to give you a set of numbers, or as you as you enter input from the user, a set of numbers, and I will give you an example.
2. And you take that and I want you to tell me what is essentially sorted, the numbers printed to me the sort of list so you enter a list of numbers and I wanted you to sort them for me.
3. and print them out, then after that I wanted to do our operation like average maximum minimum that's going to be so you have essentially a set of items and I wanted to do some operations on them, that is a question.

Summary:

Given user input or a set of numbers, sort the numbers and print them, get the average, minimum, maximin and other operations

1. Know when to use a dictionary or a list
2. Know how to sort each and how to do operations on their data

Q2 [8 pts]: Be familiar of queue (FIFO) and stack (LIFO) ADT and how they relate to each other?

1. Second Question
2. Essentially, that is a tough one, and i'm going to give you more about what the question is because I wanted to think about it before the test as soon as you have.
3. Assume that you have two stacks
4. how you could implement out of these two stacks, a queue.
5. So I want you to create for me as a queue of abstract data type out of two stacks.
6. queue (FIFO) first in first out and stack (LIFO) last in first out
7. So I want you to write me that code
8. To do the operation on the queue why the new implementation is two stacks.
9. Okay there's only thing I can tell you about.

Summary:

Create a queue like data-type (first in first out and stack) using two stacks (last in first out)

Q3 [9 pts]: Be familiar with binary search and worst-case run-time?

1. Design algorithm, and for the following operation in a binary tree,
2. so you have a binary tree, and I want you to write me that code to find the next element if your using pre-order next AND/OR in-order next AND/OR post-order next
3. i'm going to give you a node in the thee and i'm going to tell you, given a thee write me that code to get me.
4. Depending on that operation pre order next or in-order next or post-order next,
5. these three operation we discussed in the class explicitly .
6. So I want you to write me that code, assuming that you have a binary tree and given a binder three I will give you a node in the three.
7. And I want you to tell me what is the next node if i'm using pre order or in order or post order
8. so you better go and understand these operations and if i'm you, I will start writing code.
9. so these methods is going to take one argument, which is the current node.
10. And what I want you to return for me out of your code is what is the next node in that tree if I started with node P some note and I tell you give me the pre order was the next note if i'm using pre order or what's the next node if i'm using in order

Summary:

Given a binary tree, using any of the following, pre-order next AND/OR in-order next AND/OR post-order next, to find the next node after the node P (also given)

Q4 [6 pts]: Be familiar with hashing and chaining?

1. fourth question last question is very easy, which is i'm going to give you a set of numbers and i'm going to tell you, you have a hash table.
2. And I give you a size of the table some number and I tell you drove for me show me where these elements i'm going to give you will go into the hashtag.
3. meaning the first element goes in index five second element goes at index to whatever and you know the fix so you do that, I will give you the elements values the key values, and I will give you the size of the hash table, and I will give you also the hash function.
4. Okay, so you need to just draw me an array and write me in each element in the array what values would be there do not worry about sharing or any of the things we cover today as soon as change just tell me that that element will go into index five.
5. that's all I care about but draw me that so draw me the array with a number of entries and show me each entry would have how many elements and which entity will be empty that kind of thing

Summary:

Given a hash table, the size of table, the key values, the elements values, and the hash function, draw what the hash table would look like

To sum up everything:

**So that is a midterm and I give you a lot of information about it because I wanted to work on it before midterm.**

1. Given user input or a set of numbers, sort the numbers and print them, get the average, minimum, maximin and other operations
2. Create a queue like data-type (first in first out and stack) using two stacks (last in first out)
3. Given a binary tree, using any of the following, pre-order next AND/OR in-order next AND/OR post-order next, to find the next node after the node P (also given)
4. Given a hash table, the size of table, the key values, the elements values, and the hash function, draw what the hash table would look like