Module 4
iOS Application Development

Assignment 6 – Swift Assignment

Swift 5 Properties + General practices:

Problem 1:

Define a class student as following:

- The class has the following stored properties:
  - Name: which is a string
  - Scores: which is an array of course scores.
- The class also has a computed property called average which is the average of courses' scores.
- Define an array of arbitrary students. (Instance of students with random names and scores)
- Find the top rank student.

Problem 2:

Define an Enum, called AppleDevice with the following cases:

- iPhoneXs
- iPhoneXR
- iPhone8
- iPhone7

Add a computed property to the enum which returns the price of each of the above item. Here is the list of price (in $):

- iPhoneXs: 1000
- iPhoneXR: 1100
- iPhone8: 800
- iPhone7: 750

Problem 3: Property Observers

Define a class call MyNotification which contains a property called seen of type Boolean and a property called totalSeen of type int.

- The class has a type method called searchIt which takes an array of number and a functional type called predicate of type (int)->Bool.

- The class has another type method called fillIt which receives an input called size (of type int) and return an array with the size of the number. The fillIt method generates some random numbers between 1-100 to populate an array and return the array.
- The array produced by the fillIt method is then given to searchIt method.
- Then define 2 arbitrary predicates like
    - Predicate1: The number is dividend of 3
    - Predicate2: The number is an even number.
- Call the searchIt function once with Predicate1 and once with Predicate2.
- The searchIt function will iterate over the input array and apply the predicate to the items of the array. Any time, the predicate returns true, you should inform another class called MyObserver.
- At each time the predicate holds, the MyObserver class is notified about two things:
    - 1- The fact that the predicate holds
    - 2- The item in the array on which the predicate holds
- At the end of running each predicate on the array the MyObserver class will know about the following:
    - Number of times the predicate holds
    - The sum of numbers on which the predicate holds.
- At the end the MyObserver class will print the following info: (the numbers re just examples)
    - Predicate1: number of holds: 10 total: 87
    - Predicate2: number of holds: 11 total: 81

You should use the property observers to solve this problem.

Problem 4: Function Type as computed property

Define a class call MySort. The class has the following:

- A stored property called items which is an array of integer
- A read-only computed property called sorting with type ([int])->Void

Define a class called MyBubbleSort to be the child of MySort class.
Define a class called MyInsertionSort to be the child of MySort class.

Both child classes will override the *sorting* computed property such that the MyBubbleSort class implements the BubbleSort algorithm and the MyInsertionSort will implement the InsertionSort.

Then define one instance from each of MyBubbleSort and MyInsertionSort and assign them an arbitrary array of integer. Then use their sorting computed properties to sort the arrays and print the results.

Bubble Sort: http://cs-study.blogspot.ca/2012/12/bubble-sort.html
Insertion Sort: http://cs-study.blogspot.ca/2012/12/insertion-sort.html

Problem 5: HackerRank / Missing Number

Solve the Palindrome problem in Swift.
https://www.hackerrank.com/challenges/palindrome-index/problem

Problem 6: HackerRank / Missing Number

Solve the Missing number problem in Swift.
https://www.hackerrank.com/challenges/missing-numbers/problem

Problem 7:

Define a struct called Circle with the following properties:

1- Variable instance property called radius
2- Constant Type property called PI (which is the PI number which is 3.14)
3- Define a computed property called area. It represents the area of the circle.
4- Write some examples to work with the Circle class.