iOS Application Development
Swift Development

Assignment5

Swift 5: Enumeration, Struct, Class

Problem1

- Struct Date:
  - Define a structure called Date with three integer fields, day, month and year.
  - Define a static method for this structure which receives a number between 1 and 365 and convert it to day, month and year. This function will return a Date struct
  - Test it: Create a few instances from this struct and test the static function with some different numbers.

- Enum WeekDay
  - Define an Enumeration with a raw values of type String for its cases to represents days of the week.
  - Define a static function for this enumeration which receives a Struct Date and return an Enum Weekday. The method tells what day of the week is the given input date.

Problem2

- Let's do some math:
  - Define a structure called point
  - Point has two integer variables called: x and y
  - Create a method called reset which set the x and y to 0
  - Define an instance method called printPoint, which takes a point and print its coordination in this format: the point is at coordinate [x,y] where x and y are the x and y coordination of the input point.
  - Define a static method called average which takes an array of points as well as a character. (so the method has 2 inputs). If the input charcter is 'x' then the function calculates the average of x coordination of all points in the array and returns it. Similarly if the input character is 'y' then it calculates the average of y

coordination of the input points. If the character is not ‘x’ or ‘y’ then the function returns nil.

- Define another static method called vectorAverage which takes an array of points. The method then calculates the average x and average y using the average function you defined above and create another point whose x is equal to average x and y is equal to average y and returns the resulting point.
- Then use the printPoint method to print the resulting point from previous question (average point).
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Problem3

- Define an enum called Calculator with 4 cases:
  - Sum, Subtraction, Multiplication and Division
  - The cases have an associated value which is of type (Int, Int)-> Int
  - Create a static method called calculate for the enum Calculator which takes three input parameters:
    - num1: An integer
    - num2: An integer
    - opt: A Calculator enum
  - This function uses a switch statement based on the opt and each case return the result of calling the function which is the associated value of the case. For instance if the opt is Sum, the function will calculate the sum of the two input integers (num1 and num2)
  - Test: Write some test cases to test the enum and calling the calculate method.

Problem4

- Create a class called Search which has an array of numbers as its instance variable.
- Create an instance method for this class called, reset which create an empty array and return void.
- Create an instance method for this class called randomFill which generates 10 random Integer and add them to the array of numbers and returns void (which is the instance variable of the class).
- Create a static method called linearSearch which takes a list of Integer and a number. It check whether the number exist in the list of not.

Problem5

- Define a struct classed Student. Each student is defined by the following attributes:
    - firstName
    - lastName
    - address
    - Year of birth
    - gpa
- Define a class called Classroom with an instance property which is an array of Students.
- Define a static method called printStudent for the struct Student to print the student's information (firstName, lastName, address, year of birth and gpa)
- Define an instance method for the class Classroom, called generateList. This method create 10 instances of the class students with some arbitrary information and add them to the list of students.
- Define an instance method for the class Classroom, called getHighestGpa. This methods will search into the array of Students and returns the student with the highest GPA. The method also prints the information of the student with the highest GPA.