Swift Programming Assignments

Basic, if ,switch, for, while, repeat while, Arrays

1. find area of rectangle. input length and breadth from user

2. Find Simple Interest.

3. Find sum of digits of three digit number

4. Ask user to enter four subject marks (OS,DBMS,DS,Java)
Calculate and print percent. Also print grade according to below rules.
  - A grade if percent between 80 and 100
  - B grade if percent between 60 and 79
  - C grade if percent between 40 and 59
  - D grade otherwise

5. Ask user to enter 2 two digit numbers. e.g. 45 and 89
if sum of digits of both number is equal then print their sum other wise print their multiplication.
e.g 4+5=9 is not equal to 8+9=17 then print 45*89

6. Calculate electricity Bill. Accept last month units and current month units from user, then calculate bill amount using following rules

1) 0-150 units charges 4 rs/unit
2) 151-300 units charges 6 rs/unit
3) 301-500 units 8rs/unit
4) units above 500 charges 10rs/unit

7. Ask user to enter age and yearly income and find income tax using following rules

- if age is greater than 60 and income is > 2 lac then income tax is 20% of income
- if age is below 60 and income is > 1 lac and < 2 lac then tax is 15%
- otherwise tax is 10%

8. Ask user to enter choice of Course (1. BCA, 2. MCA, 3.MBA, 4. BE, 5. M.Com, 6. B.SC.,). In response print number of months required to complete the course. Also print name of course. Use switch syntax

9. Calculate Tax on income using ?: operator. Use below rules

1. 5% if income in range 0-150000
2. 10% if income in range 150000-300000
3. 15% if income above 300000

10. print square of each number between 12 and 19

11. print all numbers between 12 and 78 which are both odd and divisible by 3

12. Find sum of 1 to N numbers. e.g. N is 12 then

find 1 + 2 + 3 +.....+ 12

13. Find sum of Square of odd numbers between two entered number.

e.g. let A = 7 and B = 45 then result is 7*7 + 9*9 + 11*11 + ...+ 45*45

14. Print following patterns

```
 1                  1
 1 2                2   3
 1 2 3              3   4   5
 1 2 3 4            4   5   6   7
 1 2 3 4 5          5   6   7   8   9
 ======================================
1                  1   2   3   4   5
2  3               1   2   3   4
4  5  6            1   2   3
7  8  9  10        1   2
11 12 13 14 15     1
======================================
```

15. Count number of digits in an entered number. also count how many digits are even and how many digits are odd.

16. print following series using for N

terms
1 , 1 , 2 , 3 , 5 , 8,
13, ...

Array

1. Store 8 Int by default in an array and Print only even numbers

2. 70 Write a program to sort array in descending order?

3. Write a program to merge two arrays in third array.

4. Given an array of sorted list of integer numbers, write a function to search for a particular item using the method of binary search.

5. Write a program for -
    a. Transpose of a matrix.
    b. Determinant of a matrix
    c. Multiply 2 matrices

Strings and Character

1. Write a program to extract a portion of a character string and print the extracted string. Assume that m characters are extracted, starting with nth character.

2. Write a program that will replace the occurrence of a string from with the string to in a given input string.

3. In a given long string - The quick fox jumped over the lazy dog

a. Calculate the number of vowels (a,e,i,o,u)

b. Calculate the number of white spaces

c. Generate a new string where 1st letter of each word is in caps. d. Calculate the length of the string

Tuple & Dictionary, Set

1. Create a dictionary to store name_of_course (key) and duration_in_month(value). store 5 pairs by default

2. Declare tuple to store information about Book Title, Price, Auther, pageCount. Store information of any 4 books in an array and print as below

```
   Title        Price       Auther
Pages

========================================
=====
    Let US C   450          Kanitkar
338
  ......................................
```

....

3. create a dictionary to store name of cricket teams according to their world rankings

4. Create dictionary to store name of states and 3 cities of each state

5. Create a set of different movie star names. Perform these operations on the set

   a. Try to add same name in the set. Is it possible ?
   b. Display all the elements of the set
   c. Remove the element at position 3

   d. Check if a given name exist in the set
   e. Display the total number of names in the set

6. Create a set of 10 numbers and perform these operations on the set

   a. Sort the elements in ascending and descending order
   b. Find the average of the elements
   c. Identify the highest and the smallest element

   d. Identify if any element is repeated, then how many times (make this true)

e. Remove the smallest element in the set

f. Print the contents of the set

Functions

1. create a function to print greater of two numbers passed in argument

2. Create a function to print greater of three numbers passed in argument

3. create a function to calculate and return factorial of a number passed in argument

4. create a function which accepts an array of Int in argument and print sum of all elements

5. Create a function that accept two Int arrays and return sum of all elements of both arrays

6. Create a function that accepts two tuples of type (Float,Int) and return t1.0/t2.0 + t1.1*t2.1

Closure

1. Create a closure that return factorial of a number

2. Create a closure that return maximum

element from array

3. create a function that takes two arguments 1. Int, 2. function type (Int)->Int and return a tuple(Int,Int) containing cube of 1st argument and value returned by 2nd argument function on 1st argument

4. create a closure to find factorial of number and pass factorial closure to above function(2nd argument in problem 3) with input number n

Class , Objects, Initializer

1. Create a class Rectangle with three data member (length, breadth & area Rectangle) length and breadth data member to store the value of length & breadth of rectangle and third variable area Rectangle to store the area of rectangle. Now also create method members

- inputValue() - to take input for length and breadth from user.
- calculateArea() - to calculate area of rectangle.
- showArea() - to display the area of rectangle.

2. Create a class DemoArithmetic with three data member that are firstNo,

secondNo to store the value given by the user and third one is result to store the result value.In this class also create following method:

a. inputValue() - to take input value from user

b. addition() - to perform addition operation

c. substraction() - to perform substraction operation

d. multiplication() - to perform multiplication operation

e. divide() - to perform divide operation

3. Create a classs Student with data member(stuName,stuId,stuPercentage) to store the information of student And also create following method:

a. inputStuInformation() - to take infromation about student from user

b. outputStuInformation() - to display information of student

4. Create a class Addition with member function addition() with following given

argument

a. three float

b array of integer

c two integer

use above method in of class.

5. Create a class Student with data

member (stuId ,stuName ,stuPer)) by using
following properties:
a. Only parameterized constructor;
b. ShowStuInformation()method - display the information of student.
c. Create three student object and call ShowStuInformation method

6. Create class Employee with variables name, id, salary.
- Create default and parameterized initializer.
- Create initiaizer for id and salary only.
- Make name optional type.
- Use self keyword in all initializers

7. Create class Farmer with varibales (name, crop, earning).
- Create default and perameterized initializer.
- Create display function
- Compare earnings of two Farmers and print name and crop of farmer who earns more.

8. Create class Circle with variable radius.
- Create default init to set radius=1.
- Create parameterized initializer.
- Create display function to display radius and area.

- Create function isBiggerThan(c: otherCircle) -> Bool
- Create Two objects and call all the above functions

9. Create class BankAccount with data members accountNo, name, balance.
    - Create display() method.
    - Create another method deposit(amount:Float) which add amount value to balance
    - Create withdraw(amount:Float) method which subtract amount from balance.
    - Store 5 BankAccount Information in an Array and display all records.

Ask user to select a choice from below and perform operation
    1. Display account detail by account number
    2. Deposit amount in account by account number
    3. Withdraw amount in account by account number
    4. Delete account by account number.

Static Variable

1. Create class Book with variable title, price.
    - Add static variable discountRate.
    - Add static variable count. Increment count variable by one in

default and parameterized initializer.

- Add method to display discountRate and count variable.
- Add method to calculateDiscount on Book price
- Ask user to enter 4 Book details and print sum of all Book prices and sum of total discount on all 4 books

2. Create class Voter with variables name,age,address.
    - Add static variable votingAge.
    - Add method isVoter()->Bool which returns true if age is greater or equal than votingAge.
    - Add a method to print value of votingAge
    - Store information of 5 person in an array and call isVoter() method on all 5 person and print result of isVoter().

Computed Property and Property Observer

1. Create class Student with stored property name,rollno,percent.
    - Create default and parameterized initializer.
    - Create computed property grade calculated as .

        'A' grade if percent>75 and <100,
        'B' grade if percent>60 && <=75,
        "F" grade if percent <=60

- Store 10 student information and print as below

```
    rollno     name    percent   grade

----------------------------------------
    101        ankur   67        B
    103        amul    34        F
    ....................................
.
```

2. Create class Tile to represent a floor tile with side as stored variable.
    - Create computed property to return area of Tile.
    - Ask user to enter floor area and length of a tile , then calculate how many tiles required to complete the floor with the Tile.

3. Create a class IncomeTax which has the following attributes – Income. Duration, Savings, Tax_calculated. You can also create methods in the class that can be used to compute the property value.
    a. Store the savings as lazy stored property
    b. Add property observers for Income and Duration c. Tax calculated is a computed property

For calculating the tax, follow these

rules

a. If income is < 250000, then no income tax

b. If income is 250000 < 500000, reduce 250000 + savings (which cannot be more than 150000) from the income and calculate the tax as 20% of the remaining amount.

c. If income is > 500000, calculate tax based on rule a and rule b, and then calculate additional tax of 30% on the remaining amount.

Inheritance

1. Create class Student with variable (name,course,dateOfBirth)

- create SchoolStudent class with variable (fees) and inherit class Student
- create CollegeStudent with variable(sem and fees) and inherit class Student
- create class PGStudent with variable(mainSubject, percent) and inherit CollegeStudent
- add default and parameterized initializer in all classes

2. Create class Employee(id,name,salary) and add display function

- create class PartTimeEmployee with variable(hoursWorked , hourlyRate) and inherit - class Employee. Add calculateSalary() function to calcualte salary as

    salary = hourlyRate * hoursWorked

- create class FullTimeEmployee with variables(basic,da,pf) and Add calculateSalary() function to calcualte salary as

    salary = basic + da - pf

- add default and parameterized initializer in all classes

- Create a global function getTax() which accept Employee object in argument and calculate and print income tax on employee salary(12.5% of salary)
- Also try to pass Objects of PartTimeEmployee and FullTimeEmployee to getTax() method

3. Create class BankAccount with variables (accountNo, balance).

- Add default and parameterized init.
- Add display method
- Add depositAmount(a:Float) method to increase balance
- Add withdrawAmount(a:FLoat) to subtract from balance

Create class SavingAccount with

variable(customerName,homeAddress) and Inherit class BankAccount.

- Add static variable minimumBalannce.
- Add display method
- override withdrawAmount(a:FLoat) to check minimumBalance

Create class CheckingAccount with variable(shopName,shopAddress) and Inherit class BankAccount.

- Add static variable overDraftLimit.
- Add display method
- override withdrawAmount(a:FLoat) to check overDraftLimit

Create an Array of BankAccount type and append 3 objects of SavingAccount type and 4 objects of CheckingAccount Type with default data.

Display all account information on screen

— Protocols ——

1. Create a class Bird with properties - name, habitat, food, feather colour.

Create a protocol FlyingStyle, which has a method fly (). Conform the protocol to Bird class and write code for the fly method.

2. Create protocol Taxable with

variables taxRate{get}, and function getTax()->Float

- create class Employee(id,name,salary) add display function. Implement Taxable protocol. Decide income taxRate 30% for salary above 10 lac, 20% for salary between 5 and 10 lac and 6% for salary below 5 lac

- create class Restaurent (restaurent name, Bill amount). add display and input function. decide GST 10% and implement Taxable protocol to getTax()

- create 2 object of Employee and 3 Obj of RestaurentBill and print total amount of tax on all 5 objects

- Create Global function that accept reference of type Taxable and print 5% of refund on tax applied.

— Structure ——

1. Create structure Fraction to represent fractional values like x/y, a/b.
create variables numerator and denomerator
create display method to display Fraction data as x/y

create global function that accept two

Fraction object and return their sum in third Fraction object

2. Define a structure called Cricket which has following info – Player Name, Team Name, Batting average. Use initializer to initiate cricket structure. Declare an array cricket players with 10 elements and display the names of the players in order of their batting average.

Extension , Operator Function and Generics

1. Create extension of Double to find how many digits before decimal point
2. Create extension of Int to get middle digit
3. Create extension of Int and define ++, -- operator function
4. Implement Swapping of two values using Generics
5. Implement Queue operations using Generics