軟體人才培訓學院 / **iOS Class**

Remote Learning Assignment - Week 1

Part 1: Git & GitHub

1. Please create a public GitHub repository named "**Remote-Assignments**" for uploading your homework. Please send your repository link to us through Discord direct message and we will check your assignments through your repository every week. We need you to structure your folders as below:

```
- Remote-Assignments
        - week1
                - [your assignments]
        - week2
                - [your assignments]
        - week3
                - [your assignments]
        - week4
                - [your assignments]
```

2. Here are some Git and GitHub commands we usually use in software development. Please explain the meanings and use cases of them.
    a. git status
    b. git diff
    c. git add
    d. git reset
    e. git commit
    f. git log
    g. git branch
    h. git merge
    i. git push [repo_name] [branch_name]
    j. git remote
    k. fork
    l. (Advanced) git rebase
    m. (Advanced) git cherry-pick
    n. (Advanced) git reflog
    o. (Advanced) git tag
3. Please describe how to establish a GitHub repo and how to upload the local projects to GitHub. Try to explain your answers with as much detail as possible.

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Part 2: Basic

1. Please explain the difference between `let` and `var`.

2. In Swift, we usually define a variable through the syntax as below:

```
var x: Int = 10
```

   We use the formula: `2 * radius * pi` to calculate the circumference. Now, please define a variable `pi` and assign a value to it. You can refer to the syntax above while thinking about using `var` or `let` and which data type it should be.

3. Declare two constants `x` and `y` of type `Int` then assign any value to them. After that, please calculate the average of `x` and `y` and store the result in a constant named `average`.

4. Following Q3, now we want to save the average in a record system, but the system doesn't accept 65 but 65.0.

   - Please solve this problem so that we can put the average in the record system.
   - Please explain the difference between (10 / 3) and (10.0 / 3.0).

5. Declare two constants that values are 10 and 3 each, then please calculate the remainder and save the result in a constant named `remainder`.

6. Swift is a very powerful language that can infer the data type for you (`Type Inference`) while we still need to know the basics well. Please change the following codes into the ones with the type annotation.

   Ex: `var x = 10` => `var x: Int = 10`

```
var flag = true
var inputString = "Hello world."
let bitsInBite = 8
let averageScore = 86.8
```

7. What is Type Inference in Swift?

8. What is the issue about this piece of code?

```
var phoneNumber = 0987654321
phoneNumber = "Hello world."
```

9. Compound assignment operators are very useful when programming. Please declare a variable salary with initial value 22000, and use unary plus operator adding 28000 to salary, so it will be 50000 after this process.

10. You should notice that '=' has a different meaning in programming. In the real world, '=' means equal while in programming, '=' means assign. You simply put the right hand side data into the left hand side variable or constant.

    Now please write down the Equality operator in Swift.

Part 3: Collection

You should know how to declare an `Array` in Swift, and also how to add, remove, insert, read an object in an array. You should be familiar with the following syntax: `append`, `insert`, `remove`.

Arrays are dangerous in Swift. If you access the array with an index which is out of range, your app will crash with fatal error. Please interact with the array very carefully.

1. Please initialize an empty array with String data type and assign it to a variable named `myFriends`.
2. According to Q1, now I have three friends, 'Ian', 'Bomi', and 'Kevin'. Please help me to add their name into `myFriends` array at once.
3. Oops, I forgot to add 'Michael' who is one of my best friends, please help me to add Michael to the end of `myFriends` array.
4. Because I usually hang out with Kevin, please move Kevin to the beginning of the `myFriends` array.
5. Use for…in to print all the friends in `myFriends` array.
6. Now I want to know who is at index 5 in the `myFriends` array, try to find the answer for me. Please explain how you get the answer and why the answer is it.
7. How to get the first element in an array?
8. How to get the last element in an array?
9. Please initialize a `Dictionary` with keys of type String, value of type Int, and assign it to a variable named `myCountryNumber`.
10. Please add three values 1, 44, 81 to `myCountryNumber` for keys 'US', 'GB', 'JP' respectively.
11. Change the value of 'GB' from 44 to 0.
12. How to declare an empty dictionary?
13. How to remove a key-value pair in a dictionary?

Part 4: Control Flow

1. Here is an array:

```
let lottoNumbers = [10, 9, 8, 7, 6, 5]
```

   Please use For-In loop and `Range` to print the last three members in the `lottoNumbers` array.

2. Please use a **for-in** loop to print the results as the images listed below respectively (through `lottoNumbers`):

```
5
6
7
8
9
10
```

```
10
8
6
```

3. Please use a **while** loop to solve the Q2.

4. Please use a **repeat-while** loop to solve Q2.

5. What are the differences between **while** and **repeat-while**?

6. Declare a variable `isRaining` to record the weather. Please write a statement that if the weather is raining, print "It's raining, I don't want to work today.", otherwise print "Although it's sunny, I still don't want to work today."

7. In a company, we might use numbers to represent job levels. Let's make an example. We use 1 for the Member, 2 for Team Leader, 3 for Manager, and 4 for Director. Now, declare a variable named `jobLevel` and assign a number to it. If the jobLevel number is in our list, print the relative job title name; if not, just print "We don't have this job". Please use the `if-else` statement and the `switch` statement to complete this requirement separately.

Part 5: Function

1. What are the return types in the following statements?

```
func birthday( ) -> String {

}

func payment( ) -> Double {

}
```

2. Please declare a function named `multiply` with two arguments `a` and `b`. This function won't return any value and will only print out the result of `a * b`. Be noticed that we want to give the argument `b` a default value of 10.

3. What's the difference between **argument label** and **parameter name** in a function?

4. Please declare a function named `greet` with `person` as an argument label and `name` as a parameter name. This `greet` function will return a String. For example, if you call the function greet like this:

```
greet(person: "Luke")
```

It will return the string: "Hello, Luke".