**2017 Fall : COMP-SCI 5590 – Special Topics**

**Python Programming**

**Lesson2: List, Tuples, Functions, Loops, if Conditionsin python**

In this lesson all kinds of controls in python will be reviewed.

1. Conditional statements: if else statements
2. Working with Tuples, Lists, Functions
3. Various kinds of Loops: definite and indefinite loops, using files in loops, Nested Loops

**Use case Description:**

use case is related to renting a car. The goal of this use case is to calculate the money that one should pay when renting a car. Surely this money will be affected by the kind of car, distance, kind of petrol, number of days…

So, here user answers a couple of questions then based on those answers a message will be printed in the terminal about the money that person has been charged.

**In class exercise:**

* **Calculate character frequency in a string**

- the information you should know before programming this:

when you create a variable with string type like str= “jdjdokpwsuyhubx”, if you assign this variable to a list, you can access to each letter through for. So for programming this, you firstly put the string variable into list, then iterate through them to find the frequency of each character.

* **Get a string and calculate the number of digits and letters**

you should use isdigit() and isalpha() to recognize which kind of letter or number the string contains

* **Write a program that takes a list of numbers (for example, a = [5, 10, 15, 20, 25]) and makes**
* **a new list of only the first and last elements of the given list.**

the purpose behind this is how to access the elements of the list, in this example you should return 5 and 25

* **takes a list of words and returns the length of the longest one**

- the purpose here is how to take advantage of the tuples when we are using the list.

for programming this you may want to follow this approach,

1. having two list one for your words like : [**"PHP"**, **"Exercises"**, **"Backend"**]

2. one for keeping the count of the letters in each word like word\_len

3. then iterate through the word\_list, then append the LEN of each word to the list, so you will

4. have a list which contains both the word and len of the word like this [(3,”php),(9,”Exes”), (7,”backend”)].

5. Then sort this list

6. then return the last tuple

* **Draw a Game board**

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This one is 3x3 (like in tic tac toe). Obviously, they come in many other sizes (8x8 for chess)

Ask the user what size game board they want to draw, and draw it for them to the screen using

Python’s print statement. Hint: use functions.

heightinp= int(input(**"Enter the height of the board: "**))

widthinp= int(input(**"Enter the width of the board: "**))

board\_draw(heightinp,widthinp)