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**CIS115 Introduction to Programming and Logic**

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LAB 08 **FUNCTIONS [PART 1]**

# Objectives

In this lab assignment, students will learn:

- How to define a void function

- How to use a void function

- How to write code to pass an argument to a function

- How to write and use the main function

# Goals

In this lab assignment, students will demonstrate the abilities to:

- Define a void function

- Use a void function

- Write code to pass an argument to a function

- Write and use the main functions

# Instruction and Problems

Write a Python program for each of the problems in this lab. The following is an example.

*Lunch combos in the cafeteria of a community college include an entrée and a beverage. Write a program for customers to enter their choices. Define and use the following two functions:*

*chooseEntree : handle choice of entrée*

*chooseBeverage: handle choice of beverage*

*Also write and use a main function to implement the mainline logic of the program.*

Python program:

\_\_author\_\_ = **'Man-Chi Leung'  
  
def** main():  
 chooseEntree()  
 print()  
 chooseBeverage()  
  
**def** chooseEntree():  
 print(**'Entree:'**)  
 print(**'Enter 1 for fish and chips'**)  
 print(**'Enter 2 for burger and fries'**)  
 print(**'Enter 3 for fried chicken and smashed potato'**)  
 print(**'Enter 4 for barbecue pork'**)  
 entree = int(input(**'Please enter your choice: '**))  
 **if** entree == 1:  
 print(**'You have chosen fish and chips'**)  
 **elif** entree == 2:  
 print(**'You have chosen burger and fries'**)  
 **elif** entree == 3:  
 print(**'You have chosen fried chicken and smashed potato'**)  
 **elif** entree == 4:  
 print(**'You have chosen barbecue pork'**)  
  
**def** chooseBeverage():  
 print(**'Beverage:'**)  
 print(**'Enter 1 for iced tea'**)  
 print(**'Enter 2 for soda'**)  
 print(**'Enter 3 for coffee'**)  
 beverage = int(input(**'Please enter your choice: '**))  
 **if** beverage == 1:  
 print(**'You have chosen iced tea'**)  
 **elif** beverage == 2:  
 print(**'You have chosen soda'**)  
 **elif** beverage == 3:  
 print(**'You have chosen coffee'**)  
  
main()

Please use PyCharm to type and test your programs. Submit the Python files to Blackboard for credit. In this lab, you should submit 4 Python files, one for each problem.

## Problem 1

An instructor wants to create a short computer quiz for his students. There are only two questions in the quiz:

Question 1:

The physical devices that a computer is made of are referred to as \_\_\_\_\_\_

a. hardware

b. software

c. the operation system

d. tools

Enter your answer:

Question 2:

The part of a computer that runs programs is called \_\_\_\_\_\_

a. RAM

b. secondary storage

c. main memory

d. the CPU

Enter your answer:

Write a program to implement this quiz. Define and use the following two functions:

question1: Display question 1, get answer and show whether the answer is correct or not. The correct answer of this question is ‘a’.

question2: Display question 2, get answer and show whether the answer is correct or not. The correct answer of this question is ‘d’.

Also write and use a main function to implement the mainline logic of the program. The following is an example.

Question 1:

The physical devices that a computer is made of are referred to as \_\_\_\_\_\_

a. hardware

b. software

c. the operating system

d. tools

Enter your answer: b

Incorrect.

Question 2:

The part of a computer that runs programs is called \_\_\_\_\_\_

a. RAM

b. secondary storage

c. main memory

d. the CPU

Enter your answer: d

Correct.

Save your Python program in a file named **Lab08P1.py**. Submit the file to Blackboard for credit.

## Problem 2

A health insurance company wants a program to promote health and fitness. This program can do two things: calculate BMI (Body Mass Index) and determine whether a person has high blood pressure. To calculate BMI, the user must enter his height (in inches) and weight (in pounds). Us the following formula to calculate BMI:

BMI = (703 \* weight) / (height\*height)

To determine whether a person has high blood pressure, the user must enter his systolic pressure and diastolic pressure. If the systolic pressure >= 140 or the diastolic pressure is >= 90, he has high blood pressure.

Define and use the following two functions in this program:

calc\_bmi: Get height and weight from the user. Calculate and display BMI.

hypertension: Get systolic pressure and diastolic pressure from the user. Determine and display whether the user has high blood pressure.

Also write and use a main function to implement the mainline logic of the program. The user chooses to calculate BMI only, to determine high blood pressure only, or both. The following is an example.

Enter 1 to calculate BMI only

Enter 2 to determine whether you have high blood pressure only

Enter 3 to do both

Enter your choice: 3

Enter height (in inches): 67

Enter weight (in pounds): 150

Your BMI is: 23.490755179327245

Enter your systolic pressure: 132

Enter your diastolic pressure: 91

You have high blood pressure.

Save your Python program in a file named **Lab08P2.py**. Submit the file to Blackboard for credit.

## Problem 3

Write a program to convert kilometers to miles. Define a function convert\_to\_miles to convert distance from kilometers to miles with the following formula:

miles = kilometers x 0.6214

This function does not get any input from the user directly. Instead, the distance in kilometers is passed to this function when it is called. In the main function, ask the user to enter a distance in kilometers. Pass it to convert\_to\_miles as an argument.

The following is an example.

Enter distance in kilometers: 12.46

It is equivalent to 7.742644 miles.

Save your Python program in a file named **Lab08P3.py**. Submit the file to Blackboard for credit.

## Problem 4

Write a program to calculate tuition for students of a community college. In-state students pay $60 per credit hour, and will pay for only 12 credit hours even if they register for more hours. Out-of-state students pay $200 per credit hour, and will pay for 15 credit hours as the maximum. In the main function, ask the user whether he is in-state or out-of-state. Then ask the user how many credit hours he is taking. Pass number of credit hours to the following two functions:

Tuition\_instate: Calculate and display tuition for in-state students.

Tuition\_outstate: Calculate and display tuition for out-of-state students.

Call one of these two function to calculate tuition. The following are two examples.

Are you in-state students? [y/n] y

How many credit hours are you taking? 14

You are paying in-state rate

Please pay $ 720

Are you in-state students? [y/n] n

How many credit hours are you taking? 17

You are paying out-of-state rate

Please pay $ 3000

Save your Python program in a file named **Lab08P4.py**. Submit the file to Blackboard for credit.

# Grading rubric for Each Problem

Writing and using main function [10 points]

Writing and using other functions [15 points]