Algorithms & Data Structures

Lab 5 (Functions in Python)

EX1:

```
# This program demonstrates a function.
# First, we define a function named message.
def message():
    print('Software Engineering')
    print('Mosul University')
# Call the message function.
message()
```

EX2:

```
# This program has two functions. First we
# define the main function.
def main():
    print('I have a message for you.')
    message()
    print('Goodbye!')
# Next we define the message function.
def message():
    print('I am a student at Software '+
          'Engineering Department,')
    print('Mosul University.')
# Call the main function.
main()
```

EX3:

```
# This program displays a random number
# in the range of 1 through 10.
import random
def main():
    # Get a random number.
    number = random.randint(1, 10)
    # Display the number.
    print('The number is', number)
# Call the main function.
main()
```

EX4:

```
# This program demonstrates an argument being
# passed to a function.
def main():
    value = 5
    show_double(value)
# The show_double function accepts an argument
# and displays double its value.
def show_double(number):
    result = number * 2
    print(result)
# Call the main function.
main()
```

EX5:

```
# This program uses the return value of a function.
def main():
    # Get the user's age.
    first_age = int(input('Enter your age: '))
    # Get the user's best friend's age.
    second_age = int(input("Enter your best " +
    "friend's age: "))
    # Get the sum of both ages.
    total = sum(first_age, second_age)
    # Display the total age.
    print('Together you are', total, 'years old.')
# The sum function accepts two numeric arguments and
# returns the sum of those arguments.
def sum(num1, num2):
    result = num1 + num2
    return result
# Call the main function.
main()
```

EX6:

```
# This program allow the user to enter marks for a
# number of students and count the passed students
counter = 0
def main():
    print('The number of passed students is: ', check())
def check():
    global counter
    students = int(input('Enter number of students '))
    for index in range(students):
        mark = int(input('Enter mark '))
        while mark < 0 or mark > 100:
            mark = int(input('Enter a correct value '))
        if mark > 49:
            counter = counter+1
    return counter
main()
```

EX7:

```
# This program demonstrates two functions that
# have local variables with the same name.
def main():
    # Call the texas function.
    texas()
    # Call the california function.
    california()
# Definition of the texas function. It creates
# a local variable named birds.
def texas():
    birds = 5000
    print('texas has', birds, 'birds.')
# Definition of the california function. It also
# creates a local variable named birds.
def california():
    birds = 8000
    print('california has', birds, 'birds.')
# Call the main function.
main()
```

Exercises:

1. Write a Python code which has a function called (min). The function will find the minimum value of three variables of the type float.

2. Write a Python code which has two functions (input) and (check). The function (input) will allow the user to enter ten integer numbers, while the function (check) will print only the numbers above 50.

3. Write a Python code which has a function called (add). The function will add 10 to the received number.

4. Write a Python code which has two functions called (sum) and (average). The function (sum) will find the sum of three integer numbers while the function (average) will find their average.

5. Write a Python which has a function called (count). The function will count the digits in an integer variable.

6. Write a Python code which has a function called (equal). The function will receive three characters entered by the user at the main function. It will print (characters are the same) if the three characters are the same, or print (characters are not the same) if they are not.

7. Write a Python code which has a function called (reverse). The function will receive a positive integer value and make it negative and vice versa.