Experiment 1:

1. Basic programs in Python to get familiarize various programming structures.

Python Program to Print Hello world!

```
# This program prints Hello, world!

print('Hello, world!')
```

Python Program to Add Two Numbers

```
# This program adds two numbers

num1 = 1.5
num2 = 6.3

# Add two numbers
sum = num1 + num2

# Display the sum
print('The sum of {0} and {1} is {2}'.format(num1, num2, sum))
```

Add Two Numbers With User Input

```
# Store input numbers
num1 = input('Enter first number: ')
num2 = input('Enter second number: ')

# Add two numbers
sum = float(num1) + float(num2)

# Display the sum
print('The sum of {0} and {1} is {2}'.format(num1, num2, sum))
```

Python Program to Find the Square Root

```
# Python Program to calculate the square root

# Note: change this value for a different result
num = 8

# To take the input from the user
#num = float(input('Enter a number: '))

num_sqrt = num ** 0.5
print('The square root of %0.3f is %0.3f'%(num ,num_sqrt))
```

For real or complex numbers

```
# Find square root of real or complex numbers

# Importing the complex math module

import cmath


num = 1+2j


# To take input from the user

#num = eval(input('Enter a number: '))


num_sqrt = cmath.sqrt(num)

print('The square root of {0} is {1:0.3f}+{2:0.3f}j'.format(num ,num_sqrt.real,num_sqrt.imag))
```

Python Program to Calculate the Area of a Triangle

```
# Python Program to find the area of triangle


a = 5
```

```
b = 6
c = 7

# Uncomment below to take inputs from the user
# a = float(input('Enter first side: '))
# b = float(input('Enter second side: '))
# c = float(input('Enter third side: '))

# calculate the semi-perimeter
s = (a + b + c) / 2

# calculate the area
area = (s*(s-a)*(s-b)*(s-c)) ** 0.5
print('The area of the triangle is %0.2f' %area)
```

Python Program to Solve Quadratic Equation

```
# Solve the quadratic equation ax**2 + bx + c = 0

# import complex math module
import cmath

a = 1
b = 5
c = 6

# calculate the discriminant
d = (b**2) - (4*a*c)

# find two solutions
```

```
sol1 = (-b-cmath.sqrt(d))/(2*a)
sol2 = (-b+cmath.sqrt(d))/(2*a)

print('The solution are {0} and {1}'.format(sol1,sol2))
```

Python Program to Swap Two Variables

```
# Python program to swap two variables

x = 5
y = 10

# To take inputs from the user
#x = input('Enter value of x: ')
#y = input('Enter value of y: ')

# create a temporary variable and swap the values
temp = x
x = y
y = temp

print('The value of x after swapping: {}'.format(x))
print('The value of y after swapping: {}'.format(y))
```

Python Program to Generate a Random Number

```
# Program to generate a random number between 0 and 9
```

```
# importing the random module
import random

print(random.randint(0,9))
```

Python Program to Convert Kilometers to Miles

```
# Taking kilometers input from the user
kilometers = float(input("Enter value in kilometers: "))

# conversion factor
conv_fac = 0.621371

# calculate miles
miles = kilometers * conv_fac
print('%0.2f kilometers is equal to %0.2f miles' %(kilometers,miles))
```