ICS 31, Summer Session 10-wk, 2017

Lab 1

Do the following exercises. Save all of your work in a file called `lab1.py`. In your Python file, be sure to include a comment of the form **`# Problem ?`** at the beginning of the solution to each problem, where the ? is replaced with the problem number.

Problem 1 Write a program which prompts the user for the radius of a sphere and prints out the volume of the sphere.

Typical Output:

```
Enter the radius of the sphere: 2
Volume is: 33.51
```

Problem 2 Write a Python program which accepts the user's first and last name and prints them in reverse order with a space between them.

Typical Output:

```
Enter the first name: Ian
Enter the last name: Harris
Harris Ian
```

Problem 3 Write a program which accepts a sequence of numbers from the user, separated by commas, and generate and print a list with those numbers.

Typical Output:

```
Enter a sequence of numbers separated by commas: 5, 6, 7, 8
List: ['5', '6', '7', '8']
```

Problem 4 Write a program which accepts a number and prints the absolute value of the difference between that number and the number 8.

Typical Output:

```
Enter a number: 3
Absolute Value of the Difference: 5
```

Problem 5 Write a program which accepts a comma-separated sequence of numbers and prints all of the even numbers in the sequence, also separated by commas. The numbers should be printed in the same order in which they appear in the originally entered list.

Typical Output:

```
Enter a sequence of numbers separated by commas: 5, 6, 7, 8
Even numbers: 6, 8
```

Problem 6 Write a program which accepts a number and prints "True" if the number is greater than 20 and is even. It should print "False" otherwise.

Typical Output:

```
Enter a number: 25
False
```

Problem 7 Write Python expressions that correspond to each of the following statements:

a. The sum of the five even integers from 2 to 10.
b. The average of this group of test scores: 75%, 83.5%, 61%, 43%
c. 2 to the 10th power
d. A moving anteater has a mass of 50 kg and a velocity (speed) of 15 meters per second. Compute its kinetic energy using this formula: 1/2 times the mass times the velocity squared.

Problem 8 Scores on a quiz range from 0 to 5. In the Python Shell, evaluate the following assignment statement (which represents the quiz scores of all the students in a class):

```
>>> test_scores = '4325220523455023'
```

Using the variable test_scores and the indexing operators, write four separate expressions whose values are each of the following: quiz score for the 1st student, the 5th student, the 10th student, and the 16th student. Remember that indices start at zero.

Problem 9 Evaluate the following assignment statement:

```
>>> s = 'anteater'
```

For each of the following, write a boolean expression that represents the English statement:

a. The first character of string s is `'a'`
b. The last character of string s is `'r'`
c. The fourth character of string s is `'x'`
d. The first three characters of string s match the string `'zot'`

Problem 10 Write boolean expressions corresponding to each of the following statements:

a. 20 plus 35 is greater than 2 to the power of 4
b. The string `'hello'` is not equivalent to the string `'goodbye'`
c. The remainder when 10 is divided by 3 is less or equal to 1.
d. The list `['apple', 'orange', 'banana', 'mango']` contains 5 elements.

e. The number 63 is an even number.

Problem 11 Execute the following assignment statement:

```
>>> s = 'abcdefghijklmnopqrstuvwxyz'
```

Using only string concatenation and the indexing operator on the string `s`, write Python expressions that result in the following:

a. `'dog'`
b. `'tv'`
c. `'ics'`
d. `'uci'`