Programming Fundamentals

Assignment 1(a)

Problem 1: Start by executing

```
s = 'goodbye'
```

Then write a Boolean expression that checks whether:

(a) The first character of string `s` is `'g'`

(b) The seventh character of `s` is `'g'`

(c) The first two characters of `s` are `'g'` and `'a'`

(d) The next to last character of `s` is `'x'`

(e) The middle character of `s` is `'d'`

(f) The first and last characters of string `s` are equal

(g) The last four characters of string `s` match the string `'tion'`

Note: These seven statements should evaluate to `True`, `False`, `False`, `False`, `True`, `False`, and `False`, respectively.

Problem 2: Write Python statements corresponding to the following:

(a) Assign to variable `flowers` a list containing strings `'rose'`, `'bougainvillea'`, `'yucca'`, `'marigold'`, `'daylilly'`, and `'lilly of the valley'`.

(b) Write a Boolean expression that evaluates to `True` if string `'potato'` is in list `flowers`, and evaluate the expression.

(c) Assign to list `thorny` the sublist consisting of the first three objects in list `flowers`. (d) Assign to list `poisonous` the sublist consisting of just the last object of list `flowers`. (e) Assign to list `dangerous` the concatenation of lists `thorny` and `poisonous`.

Problem 3: Start by assigning to variable `answers` a list containing an arbitrary sequence of strings `'Y'` and `'N'`. For example:

```
answers = ['Y', 'N', 'N', 'Y', 'N', 'Y', 'Y', 'Y', 'N', 'N', 'N']
```

Write Python statements corresponding to the following:

(a) Assign to variable `numYes` the number of occurrences of `'Y'` in list `answers`.

(b) Assign to variable `numNo` the number of occurrences of `'N'` in list `answers`.

(c) Assign to variable `percentYes` the percentage of strings in `answers` that are `'Y'`.

(d) Sort the list `answers`.

(e) Assign to variable `f` the index of the first occurrence of `'Y'` in sorted list `answers`.

Problem 4: Write an expression involving a three-letter string `s` that evaluates to a string whose characters are the characters of `s` in reverse order. If `s` is `'top'`, the expression should evaluate to `'pot'`.

Problem 5: Write an expression involving strings `s` and `t` containing the last name and the first name, respectively, of a person that evaluates to the person's initials. If the two strings contained the first and last name of your course instructor (Usman Arif), the expression would evaluate to `'UA'`.

Problem 6: The range of a list of numbers is the largest difference between any two numbers in the list. Write a Python expression that computes the range of a list of numbers `lst`. If the list `lst` is, say, `[3, 7, -2, 12]`, the expression should evaluate to 14 (the difference between 12 and -2).

Problem 7: Start by assigning to variable `grades` a list containing an arbitrary sequence of grades (strings) `'A'`, `'B'`, `'C'`, `'D'`, and `'F'`. For example:

```
grades = ['B','B','F','C','B','A','A','D','C','D','A','A','B']
```

Write a sequence of Python statements that ultimately produce a list `count` that contains the numbers of occurrences of each grade in list `grades` in alphabetic order. For the given example, the list `count` should be

`[4, 4, 2, 2, 1]`.

Problem 8: Add one or more pairs of parentheses to each expression so that it evaluates to `True`.

(a) 0 == 1 == 2

(b) 2 + 3 == 4 + 5 == 7 (c) 1 < -1 == 3 > 4

For each expression, explain in what order the operators were evaluated.

Problem 9: Using an example of your own, explicitly convert some string to a list. Describe, in your own words, the behavior of the list constructor on a string input.