DSC510 Assignment 6

Directions

1) Your program must have a header. Use the programing style guide for guidance.

This program will perform various calculations (addition, subtraction, multiplication, division, and average calculation)

This program will contain a variety of loops and functions. The program will add, subtract, multiply, divide two numbers and provide the average of multiple numbers input by the user.

2) Define a function named performCalculation which takes one parameter. The parameter will be the operation being performed (+, -, *, /). This function will perform the given prompt the user for two numbers then perform the expected operation depending on the parameter that's passed into the function.This function will print the calculated value for the end user.

3) Define a function named calculateAverage which takes no parameters. This function will ask the user how many numbers they wish to input. This function will use the number of times to run the program within a for loop in order to calculate the total and average. This function will print the calculated average.

4) This program will have a main section which contains a while loop. The while loop will be used to allow the user to run the program until they enter a value which ends the loop. The main program should prompt the user for the operation they wish to perform. The main program should evaluate the entered data using if statements. The main program should call the necessary function to perform the calculation.

In [1]:
```
# File:   DSC510_Assignment_6.py
# Name:   Kevin Paulovici
# Date:   1/19/19
# Course: DSC 510 - Introduction to Programming
# School: Bellevue University
# Desc:   This module is for week 6 programming assignment.
#completes: 1
```

In [2]:
```python
# Function: welcome
#
# Parameter:
#   In:     none
#   Out:    none
# Returns:  none
#
# Desc:     simple function to welcome the user (customer)
def welcome():
    print("""
    #############################################
    ##                                         ##
    ##        Welcome to Week 6                 ##
    ##                                         ##
    ##        For and While Loops              ##
    ##                                         ##
    ##    This program will perform various     ##
    ##    calculations (addition, subtraction,##
    ##    multiplication, division, and         ##
    ##    average calculation)                  ##
    ##                                         ##
    #############################################
    """)
```

In [3]:
```python
# Function: main
#
# Parameter:
#   In:      none
#   Out:     none
# Returns:  none
#
# Desc:     The main function runs until the user terminates the program.
#           The user is prompted to enter an operation for performCalculation.
#           The main function will validate the entered operation.
#           The main function will call other functions.
# completes: 4
def main():
    welcome()
    while True:
        print("\n Welcome to the main function.\n\n",
                "Only a value of 0 will terminate this program,\n",
                "otherwise enter anything: \n")

        user = input(" Enter 0 or anything: ")

        if user == "0": break

        # get operation to perform
        while True:
            operation = input(" Enter an operation to occur, "
                                "valid operation are: + - * /: ")

            if operation == "+" or operation == "-" \
                    or operation == "*" or operation == "/":
                performCalculation(operation)
                break
            else:
                print(" The {} operation is not valid!".format(operation))

        calculateAverage()

    print(" End of program, thanks for playing!")
```

```
In [4]:  # Function: performCalculation
         #
         # Parameter:
         #   In:      op - user supplied math operation
         #   Out:     none
         # Returns:   none
         #
         # Desc:      This function takes a user supplied operation. The
         #            operation will be performed on two user supplied values
         #            and print the result.
         # completes: 2
         def performCalculation(op):
             op_calc = ""   # hold for calculated value
             print("\n Welcome to the performAverage function.\n\n"
                   " Enter numbers to perform {} operation one at a time."
                   .format(op))

             # Get the numbers to be averaged
             nums = getNumbers()

             if op == "+":
                 op_calc = nums[0] + nums[1]
             elif op == "-":
                 op_calc = nums[0] - nums[1]
             elif op == "*":
                 op_calc = nums[0] * nums[1]
             elif op == "/":
                 try:
                     op_calc = nums[0] / nums[1]

                 except:
                     op_calc = "N/A"
                     print("You following operation cannot occur: "
                           "{} {} {}\n".format(nums[0], op, nums[1]))

             print("\n The numbers entered were: {}\n"
                   " The operation entered was: {}\n"
                   " The calculation of {} {} {} is: {}\n"
                   .format(nums, op, nums[0], op, nums[1], op_calc))
```

In [5]:
```python
# Function: calculateAverage
#
# Parameter:
#   In:      none
#   Out:     none
# Returns:   none
#
# Desc:      This function asks the user how many numbers they
#            want to input. The user enters those numbers
#            through getNumbers. The total and average
#            numbers will be calculated and printed.
# completes: 3
def calculateAverage():
    print(" Welcome to the calculateAverage function.\n")
    count_num = []  # hold for user input
    total = 0     # hold for calc
    average = 0  # hold for calc

    # Get how many numbers to enter
    while True:
        count = input(" How many numbers do you want to use: ")
        try:
            if float(count) and float(count) > 0:
                count_num.append(float(count))
                break
        except:
            print(" Enter a valid number!")

    # Get the numbers to be averaged
    nums = getNumbers(*count_num)

    for num in nums:
        total += num
        average = total / len(nums)

    print("\n The numbers entered were: {}\n"
          " The total is: {}\n"
          " The average is: {}".format(nums, total, average))
```

```
In [6]:  # Function: getNumbers
         #
         # Parameter:
         #   In:     *count_num - optional input
         #   Out:    none
         # Returns:  numbers - list of user input numbers
         #
         # Desc:     This function asks the user for values to
         #           to be added to a list which get used for
         #           various calculations.
         def getNumbers(*args):
             numbers = []
             user_input = 2  # default to 2 for performCalculation
             if args:        # for calculateAverage
                 user_input = args[0]

             while len(numbers) < user_input:
                 temp = input(" Enter number: ")
                 try:
                     if float(temp) or temp == "0" or temp == "0.0":
                         numbers.append(float(temp))
                 except:
                     print(" ", temp, "is not valid!")

             return numbers
```

In [7]:
```python
# RUN THE PROGRAM
main()
```

```
############################################
##                                        ##
##        Welcome to Week 6               ##
##                                        ##
##         For and While Loops            ##
##                                        ##
##    This program will perform various   ##
##    calculations (addition, subtraction,##
##    multiplication, division, and       ##
##    average calculation)                ##
##                                        ##
############################################


 Welcome to the main function.

 Only a value of 0 will terminate this program,
 otherwise enter anything:

 Enter 0 or anything: 4
 Enter an operation to occur, valid operation are: + - * /: /

 Welcome to the performAverage function.

 Enter numbers to perform / operation one at a time.
 Enter number: 1
 Enter number: 0
You following operation cannot occur: 1.0 / 0.0


 The numbers entered were: [1.0, 0.0]
 The operation entered was: /
 The calculation of 1.0 / 0.0 is: N/A

 Welcome to the calculateAverage function.

 How many numbers do you want to use: 4
 Enter number: 0
 Enter number: 2
 Enter number: 8
 Enter number: f
  f is not valid!
 Enter number: 2

 The numbers entered were: [0.0, 2.0, 8.0, 2.0]
 The total is: 12.0
 The average is: 3.0

 Welcome to the main function.

 Only a value of 0 will terminate this program,
 otherwise enter anything:
```

```
Enter 0 or anything: 0
End of program, thanks for playing!
```