Intro to Python – Lesson 8

When we run our programs, sometimes everything works fine, sometimes the program crashes because of a bug in your program. There are several types of errors that can occur in a program and must be avoided.

Look at each of the videos about bugs and debugging. This first video describes what a bug is, the second describes the different types of errors that may appear in a program, the third describes the concept of debugging, and the final video looks at techniques that a programmer can use to correct the errors in a program.

https://www.youtube.com/watch?v=84VmwdGwYMA
https://www.youtube.com/watch?v=ToPP5UGgJUM
https://www.youtube.com/watch?v=rf1abcD0KDo
https://www.youtube.com/watch?v=NTaNksV-DPY

Here are a couple of tips you can use while writing a program.

- After the constants, use some print statements to check.
- After the inputs, use print statements to check. Once all the inputs are complete, add values to the statement and comment out the input statement – saves you from needing to input every run.

```
CustName = "John Doe" # input("Enter the customer name: ")
ItemCost = 39.95 # float(input("Enter the item cost: "))
```

- After each couple of calculations, use print statements to check.
- Format and display results in a well formatted document. At this point all values should be available and correct.

Try to find all the errors in this block of code: You can even type in the code and see the error provided by VSC, The local gas station does car repairs. The attendants at the station would like a program to determine the customer's bi ll. The user will be required to enter the customer's name, the cost for parts, and t he hours of labor. Determine the cost of labor using a labor rate of $35.00 per hour. The Subtotal is the cost of parts plus the cost of labor. Calculate the HST on the parts only using a rate of 15%. The total bill is the Subtotal plus the taxes. Display the customer's name, the cost of parts, the cost of labor, the HST and the total bill. Note, that the program should print all dollar amounts with a dollar sign, follow ed by the value printed to two decimal places. There are many intentional errors in this program (some logical errors, some syntax errors). Try to find them all.

```
# User Input
customer_name = input("Please input the customer name: ")
cost_of_parts = input("Please input the cost of parts")
hours_of_labor = input(int("Please input the number of hours: ")
```

```
# Processing and calculations
cost_of_labor = cost_of_labor * 30.00
subtotal = hours_of_labor + cost_of_parts
hst = cost_of_labor * 0.15
total = subtotal + hst

# Output results
print("Customer Name: {}".format(customer_name)))
print("Cost of Parts: {}".format(cost_of_parts))
print("Cost of Labor: ".format(as_dollars(cost_of_labor)))
subtotalDsp = "${:,.2f}".format(subtotal)
print("Subtotal: {}".format(subtotal))
HSTDsp = "${:,.2f}".format(hst)
print("HST: {}".format(HSTDsp))
totalDsp = "${,.2f}".format(total)
print("Total: {}".format(totalDSP)))
```

Here is another program for you to practise with. Format input and output as shown. As always place emphasis on Comments, Constants and Spacing.

The St. John's Pebbles Football Team wants a program to evaluate the quarterback and running backs based on game statistics. note that the X's and #'x to indicate variables that are entered or displayed.

Enter the date of the game, the opponent, the location which indicates if the game was home or away, the final score. For the quarterback statistics, enter the number of pass attempts, the number of pass completions, the total passing yards, the number of touchdown passes and the number of interceptions. Also enter rushing statistics including the number of rushing attempts, the total rushing yards, and the number of rushing touchdowns. Format the input to appear as follows –Use print() to set up headings as shown.

```
St. John's Pebbles Football Team
Game Statistics Program

Please enter the following required values:

     Game date (yyyy-mm-dd): XXXXXXXXXX
     Opponent: XXXXXXXXXXXXXXXXXXXXXXX

     Number of pass attempts:      ##
     Number of completions:        ##
     Total passing yards:          ###
     Number of touchdowns:         #
     Number of interceptions:      #

     Number of rushing attempts:   ##
     Total rushing yards:          ###
     Number of rushing touchdowns: #
```

For the quarterback, calculate the pass percentage as the pass completions divided by the pass attempts (this value is to be stored as a percentage). Also calculate the yards per pass as the passes completed divided into the total passing yards.

Finally, calculate the NFL Passer rating as follows. The passer rating formula is a combination of the values of four smaller formulas:

- **Formula 1:** Take the completions/attempts, subtract .3 and multiply the result by 5.
- **Formula 2:** Take the passing yards/attempts, subtract 3 and multiply the result by .25.
- **Formula 3:** Take the touchdowns/attempts and multiply the result by 20.
- **Formula 4:** Take 2.375 minus the result of interceptions/attempts, multiplied by 25.

After calculating each of the four formulas, there is one final formula required to generate your passer rating:

- **NFL Passer Rating** = The sum of the results of Formula 1, Formula 2, Formula 3, and Formula 4 divided by 6. That result is then multiplied by 100.

For the running backs, divide the total rushing yards by the rush attempts to get the average yards per rush. Also calculate the touchdown efficiency as the number of rushing touchdowns divided by rushing attempts (this value is to be stored as a percentage).

(To test use 46 attempts, 25 completions, 425 yards, 2 TDs, 0 Int will give a rating of 100.4.)

Output for the program will be all input values and all calculated values.

```
St. John's Pebbles Football Team
Game Statistics Program

Game Statistics vs XXXXXXXXXXXXXXXXXXXXX on XXXXXXXXXX
------------------------------------------------------
Quarterback Statistics:

Number of pass attempts:  ##   Pass Completion %:   ###%
Number of completions:    ##
Total passing yards:     ###   Yards Per Pass:       ###
Number of touchdowns:      #
Number of interceptions:   #   NFL Passer Rating:  ###.#

Rushing Statistics:

Number of rushing atts:   ##   Avg Yards Per Rush:  ##.#
Total rushing yards:     ###
Number of rushing TD's:    #   TD Efficiency:      ##.#%
------------------------------------------------------
```