PROG12583_Assignment 1

Revision: 0.2

Author: Dao Nam Thai – Student ID: 991739094

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About the Document

History

Revision	Date	Author	Description
0.1	2024-02-03	Dao Nam Thai	Initial Version
0.2	2024-02-04	Dao Nam Thai	Update data follow new version of source code

Contents

1 Scope

The aim of this document is to cover requirement of part B and Part C in Assignment 1 (PROG12583)
The report is based on the following the below source code:

- Thai_991739094_Assignment_1st.py
- Revision: commit 0d67c4fc6017bdc4c6089aca4f71426821ad0154

The output of this program:

```
Hello and welcome to the online fruit stand.
Please tell us your name:Dao Nam Thai
Please tell us your phone number:416-999-9999
Please tell us your postal code:5V4-3F2
First we have Apples for $0.50
How many would you like?
10
First we have Oranges for $0.65
How many would you like?
10
First we have Bananas for $0.23
How many would you like?
20
First we have GrapeFruit for $0.99
How many would you like?
20
First we have DragonFruit for $1.99
How many would you like?
100

What is your discount? (0 - 100 percent)
50
```

The Fruit Stand	Customer:		Dao Nam Thai
www.davesfruitstand.com			416-999-999
			5V4-3F2
PRODUCT	QUANTITY	UNIT PRICE	TOTAL PRICE
Apples	10	0.50	5.00
Oranges	10	0.65	6.50
Bananas	20	0.23	4.60
GrapeFruit	20	0.99	19.80
DragonFruit	100	1.99	199.00
		Sub total 1	234.90
		H.S.T	24.01
		Sub total 2	258.91
		Discount (50%)	129.46
		Amount Due	129.46

- References:
  https://docs.python.org/release/3.2.5/library/string.html#formatspec
  https://docs.python.org/3/reference/lexical_analysis.html#keywords
  https://docs.python.org/3/genindex-Symbols.html

2 Part B

Requirement:

Analyze the source code. Divide the program into keywords, declarations, statements and blocks.

2.1 Number of keywords used and actual keywords. Research the keyword using your textbooks.

No	Symbol	Example	Count of symbol
1	**if**	Assignment operator	5
2	**or**	Equality comparison	1

2.2 Number of symbols used and actual symbols. Research the keyword using your textbooks.
Total: 18 symbols are used in source code (exclude comment source code)

No	Symbol	Name	Count of symbol
1	**=**	Assignment operator	41
2	**==**	Equality comparison	4
3	**+=**	Increment assignment	0
4	**-**	Subtraction	1
5	**>**	Greater than	36
6	**<**	Less than	1
7	**:**	Colon	42
8	**“**	Double quotation mark	86
9	**‘**	Single quotation mark	124
10	**#**	Comment	58
11	**()**	Parenthesis	96
13	**[]**	Square brackets	3
14	**,**	Comma	56
15	**.**	Dot	32
16	**{}**	Curly braces	17
17	**%**	Percent	48
18	**/**	Division mark	1

3 Number of predefined Python program elements and the actual elements themselves. Identify what kind of element it is (e.g. variable, function/method, class, and module)

No	Predefined		Count of predefined
1	print	Print *objects* to the stream *file*	30
2	input	The function then reads a line from input, converts it to a string	6
3	int	Convert a number or string *x* to an integer	5
4	float	Convert a string or a number to floating point.	1

5	format	Convert a *value* to a “formatted” representation, as controlled by *format_spec*	37
6	strip	Return a copy of the string with the leading and trailing characters removed	3

3 Part C

Requirement: Attempt to cause syntax, runtime and logical / semantic errors

1 Change code in the source file with the intent of causing errors. **Explain / show what you have changed**. Note and identify any changes that happen right away in VSCode editor.

2. After each change, attempt to run the program and note the error produced if any.

3. Each time, **record / show the resulting error** displayed by the Python interpreter such that it is clear what change caused what error.

4. Identify the type of error produced and explain why you think it is of that type.

5. Attempt as many different errors as possible. The minimum number of errors is 5. It should also be at least one error for each error type, syntax, runtime and logical.

3.1. Syntax error

Error 1:

Before:

```
2   # Store information
3   STORE_NAME = "The Fruit Stand"
4   STORE_WEBSITE="www.davesfruitstand.com"
```

After:

```
2   # Store information
3   STORE_NAME = "The Fruit Stand" ?
4   STORE_WEBSITE="www.davesfruitstand.com"
```

Result error:

```
    STORE_NAME = "The Fruit Stand" ?
                                   ^
SyntaxError: invalid syntax
```

Explain: This is syntax error because the “?” is not allowed in this position.

Error 2:

Before:

```
6   # Customer information
7   sCustomerName = ""
8   sCustomerPhoneNo =""
9   sCustomerPostCode =""
```

After:

```
6   # Customer information
7   2sCustomerName = ""
8   sCustomerPhoneNo =""
9   sCustomerPostCode =""
```

Result of error:

```
py", line 7
    2sCustomerName = ""
    ^
SyntaxError: invalid decimal literal
```

Explain: This is syntax error because name of variable “2sCustomerName” is not corrected. Number ‘2’ is not allowed in the first place of variable name.

Error 3:

Before:

```
24  # Quantity
25  iItemQty_1 = 0
26  iItemQty_2 = 0
27  iItemQty_3 = 0
28  iItemQty_4 = 0
29  iItemQty_5 = 0
```

After:

```
24  # Quantity
25  iItemQty_1 =
26  iItemQty_2 = 0
27  iItemQty_3 = 0
28  iItemQty_4 = 0
29  iItemQty_5 = 0
```

Result of error:

```
  iItemQty_1 =
               ^
SyntaxError: invalid syntax
```

Explain: This is syntax error because the `iItemQty_1` is not assigned.

Error 4:

Before:

```
38   # Total price
39   fItemTotalPrice_1 = 0
40   fItemTotalPrice_2 = 0
41   fItemTotalPrice_3 = 0
42   fItemTotalPrice_4 = 0
43   fItemTotalPrice_5 = 0
```

After:

```
38   # Total price
39   fItemTotalPrice_1 = 0
40   fItemTotalPrice_2 = 0
41   fItemTotalPrice_3 = 0
42   fItemTotalPrice_4 = 0
43   fItemTotalPrice_5 = 0 + fItemTotalPrice_6
44
```

Result of error:

```
    fItemTotalPrice_5 = 0 + fItemTotalPrice_6
                            ^^^^^^^^^^^^^^^^^
NameError: name 'fItemTotalPrice_6' is not defined. Did you mean: 'fItemTotalPrice_1'?
```

Explain: This is syntax error because the `fItemTotalPrice_6` is not defined in anywhere before used in line 43

Error 5:

Before:

```
67   print('First we have %s for $%0.2f'% (ITEM1,fItemUnitPrice_1))
68   print("How many would you like?")
69   iItemQty_1 = int(input())
70   fItemTotalPrice_1 = iItemQty_1*fItemUnitPrice_1
```

After:

```
67   print('First we have %s for $%0.2f'% (ITEM1,fItemUnitPrice_1))
68   print("How many would you like?"
69   iItemQty_1 = int(input())
70   fItemTotalPrice_1 = iItemQty_1*fItemUnitPrice_1
```

Result of error:

```
py", line 68
    print("How many would you like?"
          ^
SyntaxError: '(' was never closed
```

Explain: This is syntax error because missing ‘)’ at the end of statement at line 68

3.2. Runtime error

The error are happened when running application

Error 1:

Before:

```
67   print('First we have %s for $%0.2f'% (ITEM1,fItemUnitPrice_1))
68   print("How many would you like?")
69   iItemQty_1 = int(input())
70   fItemTotalPrice_1 = iItemQty_1*fItemUnitPrice_1
```

After:

```
67   print('First we have %s for $%0.2f'% (ITEM1,fItemUnitPrice_6))
68   print("How many would you like?")
69   iItemQty_1 = int(input())
70   fItemTotalPrice_1 = iItemQty_1*fItemUnitPrice_1
```

Result of error:

```
    print('First we have %s for $%0.2f'% (ITEM1,fItemUnitPrice_6))
                                           ^^^^^^^^^^^^^^^^
NameError: name 'fItemUnitPrice_6' is not defined. Did you mean: 'fItemUnitPrice_1'?
```

Explain: This is runtime error is happened because `fItemUnitPrice_6` is not defined before trying to print.

Error 2:

Before:

```
115   if len(sCustomerName) > 30: #Truncate long customer name
116       sCustomerName = sCustomerName[:30]
117   prtStr = "|" + format(STORE_NAME + " |", '>37s') + \
118       " Customer:" + format(sCustomerName + " |",'>32s')
```

After:

```
115 if len(sCustomerName) > 30: #Truncate long customer name
116     sCustomerName = sCustomerName[:30]
117 prtStr = 2 + format(STORE_NAME + " |", '>37s') + \
118     " Customer:" + format(sCustomerName + " |",'>32s')
```

Result of error:

```
py", line 117, in <module>
    prtStr = 2 + format(STORE_NAME + " |", '>37s') + \
             ~~^~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
TypeError: unsupported operand type(s) for +: 'int' and 'str'
```

Explain: This is runtime error is happened because concatenating a string with an integer is not supported.

Error 3:

Before:

```
185   # Calculate discount amount
186   fDiscountAmount = fDiscountPercentage*fSubTotal_2/100
```

After:

```
185   # Calculate discount amount
186   fDiscountAmount = fDiscountPercentage*fSubTotal_2/0
```

Result of error:

```
          fDiscountAmount = fDiscountPercentage*fSubTotal_2/0
                            ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~^~
      ZeroDivisionError: float division by zero
```

Explain: This is runtime error is happened because trying divide by zero.

Error 4:

Before:

```
88   print("How many would you like?")
89   iItemQty_5 = int(input())
90   fItemTotalPrice_5 = iItemQty_5*fItemUnitPrice_5
```

After:

```
88   print("How many would you like?")
89   iItemQty_5 = int("Hundred")
90   fItemTotalPrice_5 = iItemQty_5*fItemUnitPrice_5
```

Result of error:

```
py", line 89, in <module>
    iItemQty_5 = int("Hundred")
                 ^^^^^^^^^^^^^
ValueError: invalid literal for int() with base 10: 'Hundred'
```

Explain: This is runtime error is happened because trying to convert a string that is not a valid integer representation to an integer.

Error 5:

Before:

```
182   # Calculate Subtotal2
183   fSubTotal_2 = fSubTotal_1 + fHST
```

After:

```
182   # Calculate Subtotal2
183   fSubTotal_2 = str(fSubTotal_1 + fHST)
```

Result of error:

```
py", line 186, in <module>
    fDiscountAmount = fDiscountPercentage*fSubTotal_2/100
                      ~~~~~~~~~~~~~~~~~~~~~~~~^~~~~~~~~~~
TypeError: can't multiply sequence by non-int of type 'float'
```

Explain: This is runtime error is happened because `fSubTotal_2` is string. Multiplying a string and float is not allowed.

3.3. Logical Error

Error 1:

Before:

```
77   print('First we have %s for $%0.2f'% (ITEM3,fItemUnitPrice_3))
78   print("How many would you like?")
79   iItemQty_3 = int(input())
80   fItemTotalPrice_3 = iItemQty_3*fItemUnitPrice_3
```

After:

```
77   print('First we have %s for $%0.2f'% (ITEM3,fItemUnitPrice_3))
78   print("How many would you like?")
79   iItemQty_3 = int(input())
80   fItemTotalPrice_3 = iItemQty_3*fItemUnitPrice_2
```

Result of error and explanation:

`fItemTotalPrice_3 is` wrong because the algorithm was wrong.

Error 2:

Before:

```
98   # Set zero discount when customer input out of range number
99   if fDiscountPercentage < 0 or fDiscountPercentage > 100:
100      fDiscountPercentage = 0
```

After:

```
98   # Set zero discount when customer input out of range number
99   if fDiscountPercentage < 0 and fDiscountPercentage > 100:
100      fDiscountPercentage = 0
```

Result of error and explanation:

Logic operator is not corrected. No value of `fDiscountPercentage` is satisfied these conditions.

Error 3:

Before:

```
178   # Handle exception
179   if fSubTotal_1 <= 0:
180       fHST = 0
```

After:

```
178   # Handle exception
179   if fSubTotal_1 > 0:
180       fHST = 0
```

Result of error and explanation:

`fHST` can't be assigned by 0 when `fSubTotal_1 > 0`

Error 4:

Before:

```
174   # Calculate Subtotal1
175   fSubTotal_1 = fItemTotalPrice_1+fItemTotalPrice_2+fItemTotalPrice_3+\
176       fItemTotalPrice_4+fItemTotalPrice_5
```

After:

```
174   # Calculate Subtotal1
175   fSubTotal_1 = fItemTotalPrice_1+fItemTotalPrice_2+fItemTotalPrice_3+\
176       fItemTotalPrice_4+fItemTotalPrice_4
```

Result of error and explanation:

Using wrong formula to calculate `fSubTotal_1`

Error 5:

Before:

```
122   # Print line 2nd
123   if len(sCustomerPhoneNo) > 11: #Truncate long phone number
124       sCustomerPhoneNo = sCustomerPhoneNo[:11]
```

After:

```
122   # Print line 2nd
123   if len(sCustomerName) > 11: #Truncate long phone number
124       sCustomerPhoneNo = sCustomerPhoneNo[:11]
```

Result of error and explanation:

Using wrong condition to check length of `sCustomerPhoneNo`