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Programming Assignment 3 – PA-3: Selection

Learning Outcomes

- Solve basic programming problems using a variety of skills and strategies.
- Analyse the structures within pseudocode, source code, and flowchart.
- Create entry-level programs.

Learning Objectives

- Analyse and design solutions to programming problems involving selection control structures.
- Apply problem solving skills using sequence control structures, modularization, variables, selection control structures, boolean logic, pseudocode, flowchart, and basic code creation in a programming language.
- Demonstrate knowledge of topics covered in the module.

Directions

Due date: Please see D2L.

Rubric: Please see D2L

Topics covered: Module 4 and below. You are **not** allowed to apply material covered in subsequent modules.

Libraries: Please consult with your instructor before incorporating any third-party library or non-standard library in your submission.

Collaboration model: This is an **individual** assignment. You can discuss potential approaches to a solution with others but you **must not** exchange or copy code, pseudocode, flowchart, or descriptions from others. You **must not** copy code from online sources or any other source (books, magazines, etc.) either.

Keep track of every source you consult (people, online sources, etc.) as you must disclose them in your submission file or near the actual usage when it makes sense.

You are allowed to consult material regarding:
- General problem solving techniques
- Pseudocode conventions
- Flowchart symbols and usage
- Python documentation
- Code convention and styles

Ask your instructor if you have questions regarding the assignment and submission instructions.

General Submission Guidelines

1. Commit deliverables to your *private* assignment GitLab repository (keep max file size at 5MB):
   `PF_TermYear_PA3`
2. Once you are ready to submit your assignment for marking, drop the submission file in the D2L assignment drop box. The file should contain:
   - Your identification information (see below).
   - Your repository address with specific revision you want to be considered.
   - External sources disclosure. Use "No external sources" when appropriate.
   - Self-reflection.
3. Submission file should be named as follows:
   `PF_TermYear_PA3_Firstname_MyBVCUsername.md`
4. All files should identify the author with the following information:
   ```
   Course code    : SODV1101
   Term/Year      : TermYear
   Assignment code: PA3
   Author         :
   BVC username   :
   Date created   : YYYY-MM-DD
   Description    :
   ```
5. Add `readme.md` file to the root of your repository. Add a brief description to it.
6. When a file contains multiple answers, clearly separate and identify each one with a header markup. For instance: `**a – Algorithm description**`
7. Pseudocode should use Markdown code markup.
8. Make sure to properly document your code, use consistent code conventions, give descriptive names to variables and methods, and use a coherent set of style and formatting rules. Strive for readable and maintainable code as well as proper selection of control structures.
9. Give sensible names to your project files. Be concise but expressive.
10. Use the following Python style guide:
    https://www.python.org/dev/peps/pep-0008/
11. Add the result of Google YAPF format checker as a text file:
    https://github.com/google/yapf/
12. With the exception of source code/config files all other deliverables should be placed on your repository under a folder named "`deliverables`".

Assignment Description

Write a program that calculates the total value of a meal after applying an optional 10% discount, a 5% tax, and a % tip, along with the breakdown of total in as few bills as possible. Bills available are 20s, 10s, 5s, and 1s.

The user will enter the meal price and coupon code after which the program will calculate discount, tax, tip, the total, and the total breakdown.

Discount is only applied when a coupon code is provided.

Tax is calculated after discount but before tip.

The total is the meal price minus discount plus the tip plus the tax.

Your program will display the price of the meal, coupon code (if provided), discount (if there is one), tax, tip, total, bills breakdown.

The tip percent is based on the meal price after taxes. The amounts are as follows:

Meal range	**Tip Percent**
.01 to 4.99	10%
5 to 10.00	12%
10.01 to 15.00	15%
15.01 to 25.00	18%
25.01 and more	22%

Expected output for a $20 meal with coupon code provided:

```
Receipt:
The meal price is $ 20.0
Coupon code is BVC
The discount is $ -2.0
The tax is $ 0.90
The tip is $ 3.402
The total is $ 22.302
1 x 20s
2 x 1s
```

Deliverables

a) A private GitLab git repository containing your work.
*Make sure you grant **Reporter** access to your instructor on your repository.*

b) Commits showing changes to your repository.

c) Self-reflection (as part of your submission file).
e.g. How did you arrive to the solution? What did you struggle with? Which kind of tests did you use to validate your solution? And so on.

d) Algorithm description in plain English

e) IPO chart

f) Hierarchy chart.

g) Pseudocode

h) Flowchart.

i) Python code

j) PyLint report. Filename: `PF_TermYear_PA3_YourInitials_plr.txt`

k) Codacy report: Dashboard, Commits, Issues, Code Patterns
Filename: `PF_TermYear_PA3_YourInitials_codacy.pdf`

l) Submission file

Items *d*, *e*, and *g* should be added to a single Markdown file:
`PF_TermYear_PA3_YourInitials_pc.md`

Items *f*, and *h* should be added to a single pdf file:
`PF_TermYear_PA3_YourInitials_diagrams.pdf`

Penalty for late submission is 5% of mark for each hour late, at instructor's discretion.
Assignment will not be accepted after submission end date (see D2L).
File with wrong name and/or format/extension will be ignored.
You will receive 0 (zero) if the URL for your commit is not correct or accessible to your instructor.

***** end of assignment**