Western Science

CS 1026 : Computer Science Fundamentals

ASSIGNMENT 01

FRIENDS DINNER

Due Date:
Wednesday February 8th, 2023 at 11:55 PM EST

The following are the instructions for assignment 01:

If you want to store a PDF version of this assignment, press `Ctrl+p` *on Windows or* `Command+p` *on Mac, the print window withh appear. Then, select* `Save As PDF` *from the* ***Destination*** *dropdown. Then click* `Save`

- INTRODUCTION

In this assignment, you will get practice with:

- Basic Python programming constructs
- Expressions, decisions
- Getting input from users
- Algorithm development and testing; designing test cases
- Following program specifications
- loops

As you organize a dinner assembly for your closest five friends at a restaurant in your city, you find yourself searching for the perfect place to dine. After much contemplation, you decide to take your companions to a restaurant that accommodates the dietary restrictions of your friends. Therefore, you decided to write a Python program inquiring about any Keto, vegan, or gluten-free dietary needs among your party members and subsequently listing the suitable meals for dinner. Table I shows the available meals according to the dietary restrictions accommodated in this restaurant.

Table I: Meals List

Dish	Keto	Vegan	Gluten-Free	Cost of the meal
Pizza	Yes	Yes	No	$44.50
Pasta	No	Yes	No	$48.99
Falafel	Yes	Yes	Yes	$52.99
Steak	Yes	No	Yes	$49.60

If the invitee has a different dietary preference that does not match any of the meals in the menu above, a beverage is offered for **$5.99**

1 FILES

For this assignment, you are asked to submit one file named `dinner.py` containing all the code required to complete this assignment.

Your program should run according to the following specifications:

1. The program will ask the user to specify the number of invitees by showing the message
   `"Please enter the number of invitees:"`
   The user is expected to enter a positive integer representing the number of invitees. We assume that the user will always provide valid input.

2. According to the number of invitees, your program should loop over all the invitees to gather information about each individual's dietary preferences. This is accomplished as follows:
   - Show the user the invitee number that you are taking the information about. You should show the message
     `"Please enter the order details for invitee Number X/Y"`
     where X is the invitee number and Y is the number of invitees.
   - The program will then ask the user if the invitee has a Keto diet with the message
     `"Do you want a keto friendly meal?"`
     If the user answers (**y** lowercase) that means yes. Anything else, even the word "yes" should be considered no.
   - The program will then ask the user if the invitee prefers a vegan meal with the message
     `"Do you want a vegan meal?"`
     If the user answers (**y** as lowercase) that means yes. Otherwise, it is considered no.
   - The program will then ask the user if the invitee prefers a Gluten-free meal with the message
     `"Do you want a Gluten-free meal?"`
     If the user answers (**y** lowercase) that means yes. Otherwise, it is considered no.
   - **Your program should decide what is the appropriate meal from the menu according to the collected dietary preference for each invitee. e.g., if the user enteres y then y then y, your program should serve Falafel for this particular friend. If the user enterss no then n then y, the program should serve beverage for this friend as none of the meals in the menu satisfies this preference.**
   - The program should keep asking the user these questions until all invitees' preferences are collected.

3. When all the information is gathered, your program will ask the user to tip the server by entering a positive number representing the **percentage** of the total bill to be given as a tip. The program will show

`"How much do you want to tip your server (% percent)?"`

And the user is assumed to enter a positive integer for the tip. E.g., if the user entered 15, this means that the tip is 15% of the total cost after tax.

4 The program then will display the order details as the following 5 lines:

- Your program prints

  `"You have X invitees with the following orders:"`

  where X is the number of invitees.

- Your program then prints

  `“Y invitees ordered Pizza. The cost is: $N”`

  where **Y** is the number of invitees who ordered pizza and **N** is the total cost for only those people, rounded to two decimal points.

- Your program then prints

  `“Y invitees ordered Pasta. The cost is: $N”`

  where **Y** is the number of invitees who ordered Pasta and **N** is the total cost for only those people, rounded to two decimal points.

- Your program then prints

  `“Y invitees ordered Falafel. The cost is: $N”`

  where **Y** is the number of invitees who ordered Falafel and **N** is the total cost for only those people, rounded to two decimal points.

- Your program then prints

  `“Y invitees ordered Steak. The cost is: $N”`

  where **Y** is the number of invitees who ordered Steak and **N** is the total cost for only those people, rounded to two decimal points.

- Your program then prints

  `“Y invitees ordered only beverage. The cost is: $N”`

  where **Y** is the number of invitees who ordered beverage and **N** is total cost for only those people, rounded to two decimal points.

5 The program then will display the total cost of the bill in three lines as follows:

- Your program prints

  `“The total cost before tax is $H "`

  where **H** is the total cost to all orders before any tax. **H** is printed to the nearest two decimal places.

- Your program then prints

  `“The total cost after tax is $N "`

  where **N** is the total cost to all orders after tax which is 13% of the total cost. You should use the total cost

calculated in the previous step, **H**, to print **N**. And, **N** is printed to the nearest two decimal places.

- Your program then prints

  `"The total cost after X% tip is $Y"`

  where **X** is the tip percentage, and **Y** is the total cost to all orders after the tip. You should use the total cost calculated in the previous step, **N**, to print **Y**. And, **Y** is rounded to the nearest integer. You can use the following equation to calculate **Y**:

$$Y = N \times \left(\frac{100 + tip}{100}\right)$$

Functional Specifications

Your program will execute as described above. The following are a few examples of the inputs and the expected outputs:

Case 1:

```
Please enter the number of invitees:2

Please enter the order details for invitee Number 1/2
Do you want a keto friendly meal?y
Do you want a vegan meal?y
Do you want a Gluten-free meal?n
--------------------
Please enter the order details for invitee Number 2/2
Do you want a keto friendly meal?y
Do you want a vegan meal?nothing
Do you want a Gluten-free meal?y
--------------------
How much do you want to tip your server (% percent)?7

You have 2 invitees with the following orders:
1 invitees ordered Pizza. The cost is: $44.50
0 invitees ordered Pasta. The cost is: $0.00
0 invitees ordered Falafel. The cost is: $0.00
1 invitees ordered Steak. The cost is: $49.60
0 invitees ordered only beverage. The cost is: $0.00

The total cost before tax is $94.10
The total cost after tax is $106.33
The total cost after 7% tip is $114
```

Case 2:

```
Please enter the number of invitees:3

Please enter the order details for invitee Number 1/3
Do you want a keto friendly meal?no
Do you want a vegan meal?neh
Do you want a Gluten-free meal?3453
--------------------
Please enter the order details for invitee Number 2/3
Do you want a keto friendly meal?y
Do you want a vegan meal?y
Do you want a Gluten-free meal?y
--------------------
Please enter the order details for invitee Number 3/3
Do you want a keto friendly meal?yes
Do you want a vegan meal?y
Do you want a Gluten-free meal?no
--------------------
How much do you want to tip your server (% percent)?15

You have 3 invitees with the following orders:
0 invitees ordered Pizza. The cost is: $0.00
1 invitees ordered Pasta. The cost is: $48.99
1 invitees ordered Falafel. The cost is: $52.99
0 invitees ordered Steak. The cost is: $0.00
1 invitees ordered only beverage. The cost is: $5.99

The total cost before tax is $107.97
The total cost after tax is $122.01
The total cost after 15% tip is $140
```

Case 3:

```
Please enter the number of invitees:4

Please enter the order details for invitee Number 1/4
Do you want a keto friendly meal?y
Do you want a vegan meal?y
Do you want a Gluten-free meal?n
--------------------
Please enter the order details for invitee Number 2/4
Do you want a keto friendly meal?n
Do you want a vegan meal?no
Do you want a Gluten-free meal?y
--------------------
Please enter the order details for invitee Number 3/4
Do you want a keto friendly meal?y
Do you want a vegan meal?y
Do you want a Gluten-free meal?y
--------------------
Please enter the order details for invitee Number 4/4
Do you want a keto friendly meal?y
Do you want a vegan meal?y
Do you want a Gluten-free meal?y
--------------------
How much do you want to tip your server (% percent)?0

You have 4 invitees with the following orders:
1 invitees ordered Pizza. The cost is: $44.50
0 invitees ordered Pasta. The cost is: $0.00
2 invitees ordered Falafel. The cost is: $105.98
0 invitees ordered Steak. The cost is: $0.00
1 invitees ordered only beverage. The cost is: $5.99

The total cost before tax is $156.47
The total cost after tax is $176.81
The total cost after 0% tip is $177
```

Non-Functional Specifications

- The program should strictly adhere to the input and output requirements, particularly the order of the input and the labelling of the output cost.
- The program should include brief comments in your code identifying yourself, describing the program, and describing key portions of the code.
- You should be bothered with writing meaningful code comments to help others, including the grading team, understand your code. A code comment that describes:
    - Identifying yourself
    - Describe the program and the reasoning behind it
    - Its input(s) and output(s)
    - Describing key portions of the code
- An example of a good comment practice:

```
# Developed by: Jo Smith
# Date: Jan 1
# Desc: A program to display a welcome message
# Inputs: None
# Output: a "Hello World!" message

# Declare and initialize two variables
num1 = 6
num2 = 9

# Print the message!
print("Hello World!")
```

- Assignments must be done individually and must be your work. Software may be used to detect academic dishonesty (cheating).
- Use Python coding conventions and sound programming techniques. For example:
  - Meaningful variable names
  - Conventions for naming variables and constants
  - Use of constants where appropriate
  - Readability, indentation, and consistency

> **REMEMBER!**
>
> Make sure you develop your code with Python 3.9 or higher as the interpreter. Failure to do so may result in the testing program failing.

2 TIPS AND GUIDELINES

- Variables should be named in lowercase for single words and camel case for multiple words, e.g., noOfInviteesOrderedPizza
- You can assume that all values entered are valid. You do not need to check if the input is valid
- Make sure to use the exact wording and spacing of the messages prompted to the user. You can copy/paste it for your convenience.
- Include all the puncuations as demonstrated in the examples. This is bacause marking will be very sensitive to

formatting.

Testing Your Program

Wondering how to verify the effectiveness of your solution? Developing a set of test cases can assist in checking the thoroughness and precision of your code. While the abovementioned examples are not exhaustive, they will aid in this pursuit. However, please note that the success of these test cases does not guarantee the complete correctness and completeness of your code. It is important to consider additional test cases that will further confirm the completeness and accuracy of your provided solution. You can create an excel sheet to calculate and compare what you get in the sheet with the output of your code.

3 RULES

- Read and follow the instructions carefully.
- Only submit the Python file described in the Files section of this document.
- Submit the assignment on time. Late submissions will receive a late penalty of 10% per day.
- Forgetting to submit a finished assignment is not a valid excuse for submitting late.
- Submissions must be done on Gradescope. They will not be accepted by email.
- You may re-submit your code as many times as you would like. Gradescope uses your last submission as the one for grading by default. There are no penalties for re-submitting. However, re-submissions that come in after the due date will be considered late and subject to penalties.
- Assignments will be run through a similarity checking software to check for code that looks very similar to that of other students. Sharing or copying code in any way is considered plagiarism and may result in a mark of zero (0) on the assignment and/or reported to the Dean's Office. Plagiarism is a serious offence. Work is to be done **individually.**

4 MARKING GUIDELINES

The assignment may be marked as a combination of your auto-graded tests and manual grading of your code logic, comments, formatting, style, etc. Below is a breakdown of the marks for this assignment:

- **[50 marks]** Testing your code for correctness and adherence to the specifications by producing the expected output
- **[20 marks]** Code logic and completeness
- **[10 marks]** Comments
- **[10 marks]** Code formatting
- **[10 marks]** Meaningful and properly formatted variables

- **Total: 100 marks**

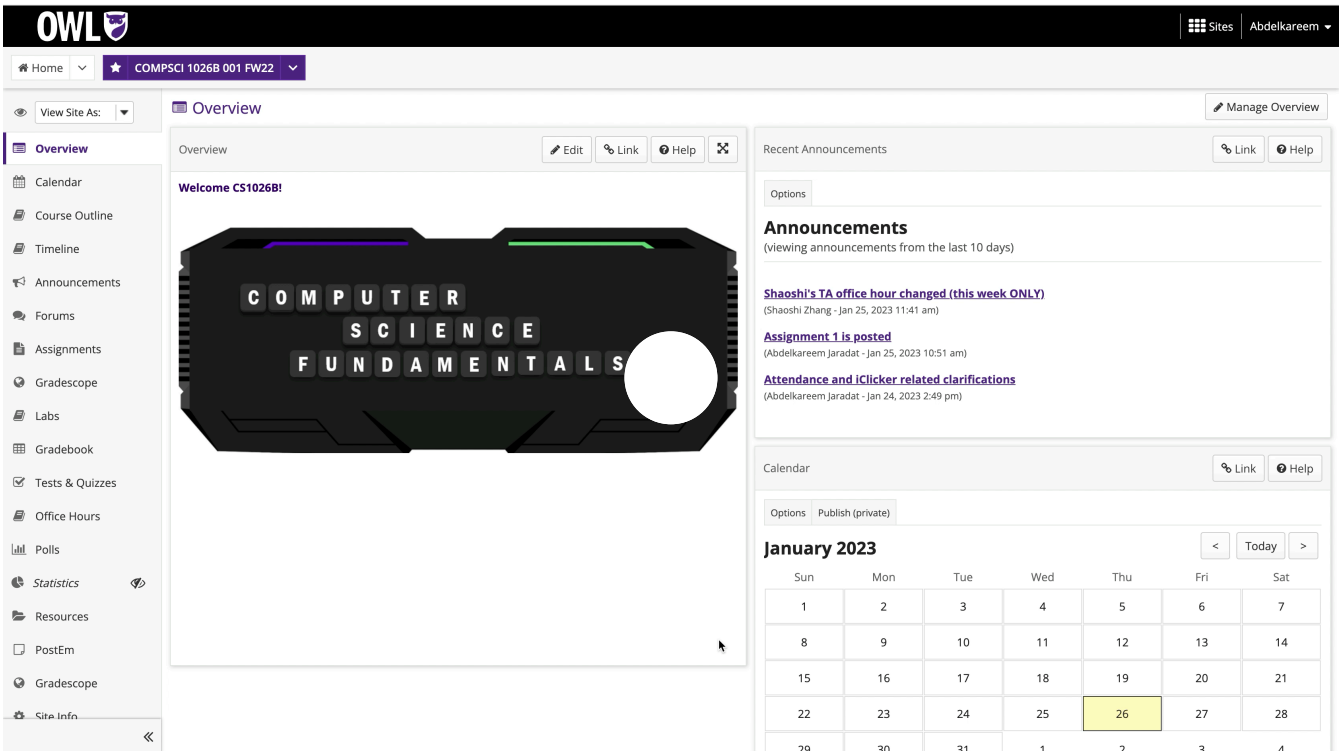
> **REMEMBER!**
>
> The weight of this assignment is **5%** of the course mark.

- GRADESCOPE SUBMISSION

1. You must submit the 1 files to the Assignment 1 submission page on Gradescope. The required file is `dinner.py`.

2. The submission will be using Gradescope.

   You can find the instruction on how to complete your submission by following the steps in this video:



> **REMEMBER!**
>
> Assignment submission after **11:55 PM** will cause late penalty of 10% per day to be deducted from your mark.
>
> Submissions through the email will not be accepted at any circumstances.
>
> Please check back this page whenever an announcement is posted regarding this assignment.

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