CS201 – Spring 2024-2025
Homework 1 – Pizza Order Program
Due March 24th, Mon, 22:00 (Sharp Deadline)

Introduction

Who doesn't love pizza? In this assignment, you will develop an advanced pizza ordering system where users can customize their pizza by choosing a size, selecting toppings, adding a drink and a dessert, and applying a discount based on their order.

Your program will use functions, including at least one that passes parameters by value and one that uses pass-by-reference.

Objective

This assignment will help you practice:

- Using functions to structure your program.
- Implementing if-else statements for decision-making.
- Applying pass-by-value and pass-by-reference concepts.
- Handling conditional pricing and discounts based on user choices.

Inputs, Flow of the Program, and Outputs

Inputs:

The program will ask the user to:

1. **Pizza Size Selection:**
    - Small ($10)
    - Medium ($15)
    - Large ($20)
2. **Number of Toppings (1-3 allowed):**
    - Available toppings and their prices:
        - Cheese ($1.5)
        - Pepperoni ($2.5)
        - Mushrooms ($2.0)
        - Olives ($1.0)
        - Bacon ($3.0)
        - Peppers ($1.5)
3. **Drink Selection:**
    - Water ($1.0)
    - Soda ($2.0)
    - Juice ($3.0)

4. **Dessert Selection:**
    - Brownie ($4.0)
    - Cookie ($3.5)
    - Cheesecake ($5.0)
    - None (no dessert)
5. **Discount Code:**
    - If the discount code is "Yes", the user receives $5 off.
    - If the user selects three toppings, they get an extra 10% discount for the pizza (not for drinks or dessert).

Flow of the Program:

- The program starts with a welcome message.
- The user selects a pizza size.
- The user chooses 1-3 toppings, with each affecting the total price.
- The user selects a drink.
- The user decides whether to add a dessert.
- The program calculates the total price based on choices.
- If the user enters a discount code, it is applied.
- The program checks if the topping discount applies.
- The program prints a detailed order summary, showing all selections and the final total.

Outputs:

The program will print the full order summary, including:

- Chosen Pizza Size and its price
- Toppings List with individual prices
- Drink Selection and price
- Dessert Selection (if any) and price
- Applied Discounts (if any)
- Final Total Price

Output Formatting:

- Use `**iomanip**` for consistent decimal places
- Display two decimal places for all floating-point numbers
- Use this line before displaying floating-point numbers:

cout << fixed << setprecision(2);

Function Prototypes & Descriptions

Your program must use the following functions:

`double getPizzaPrice(string size);`

- Returns the price of the selected pizza size.

`double getToppingPrice(string topping);`

- Returns the price of an individual topping.

`double getDrinkPrice(string drink);`

- Returns the price of the selected drink.

`double getDessertPrice(string dessert);`

- Returns the price of the selected dessert.

`void calculateTotal(double& totalPrice, double& pizzaPrice, string size, string topping1, string topping2, string topping3, int toppingCount, string drink, string dessert);`

- Computes the total order cost before applying discounts.
- Calculates the combined cost of the pizza and selected toppings, storing the result separately for further processing.
- Adds the prices of drink and dessert.
- Pass-by-reference (`double& totalPrice` and `double& pizzaPrice`) ensures `totalPrice` and `pizzaPrice` are updated directly.

`double applyDiscount(double totalPrice, double pizzaPrice, int toppingCount, string discountCode, double& discountAmount);`

- Calculates and applies discounts based on the order.
- 10% Discount: Applied only to `pizzaPrice(included toppings)` if 3 toppings are selected.

- $5 Discount: Applied to the final total if the user enters `"Yes"` for the discount code.
- Returns the **new total price** after all applicable discounts.
- Updates `discountAmount` with the total amount deducted.

```
void printOrderSummary(double totalPrice, double pizzaPrice, double discountAmount, string size, string topping1, string topping2, string topping3, int toppingCount, string drink, string dessert, string discountCode);
```

Prints the final order summary in a structured format.

Displays:

- Pizza size and price
- Toppings list and prices
- Drink and dessert selections
- Applied discounts (10% pizza discount, $5 discount code)
- Final total price

Please see sample runs for details.

Ensures all amounts are displayed with two decimal places using `fixed << setprecision(2)`.

About Submission!

Homework will not be submitted automatically. Students are responsible for manually submitting their assignments on SUCourse before the deadline. Failure to submit will result in a zero grade

IMPORTANT!

If your code does not compile, then you will get **zero**. Please be careful about this and double check your code before submission.

Note: Please avoid using cin.get() in your code for your assignment. We are using CodeRunner, and these functions may cause unexpected behaviour.

VERY IMPORTANT!

Your programs will be compiled, executed and evaluated automatically; therefore you should definitely follow the rules for prompts, inputs and outputs. You can check the example test case outputs from SUCourse to get more information about the expected output.

Order of inputs and outputs must be in the mentioned format.

Following these rules is crucial for grading, otherwise, our software will not be able to process your outputs and you will lose some points in the best scenario.

Sample Run

Below, we provide only one sample run of the program that you will develop, for more sample runs please check the SUCourse example test cases.

The *italic* and **bold** phrases are inputs taken from the user.
NOTE THAT these inputs and the newlines after the inputs are missing at SUCourse in the outputs expected from you, so please ignore this as you copy/paste your C++ code from VS/XCode to SUCourse, the same will happen to your code too. You can see samples of SuCourse output in your assignment on SuCourse.

Visual Studio/XCode Outputs

Sample Run 1

```
Choose pizza size (Small/Medium/Large): Medium
How many toppings would you like? (1-3): 2
Enter first topping (Cheese, Pepperoni, Mushrooms, Olives,
Bacon, Peppers): Cheese
Enter second topping: Olives
Choose a drink (Water, Soda, Juice): Soda
```

Would you like a dessert? (Brownie, Cookie, Cheesecake, None): ***None***
Do you have a discount code? (Yes/No): ***Yes***

Your order:
- Medium Pizza: $15.00
- Cheese Topping: $1.50
- Olives Topping: $1.00
- Drink: Soda ($2.00)
- Discount code applied: -$5.00
Final Total: $14.50

Sample Run 2

Choose pizza size (Small/Medium/Large): ***Large***
How many toppings would you like? (1-3): ***3***
Enter first topping (Cheese, Pepperoni, Mushrooms, Olives, Bacon, Peppers): ***Pepperoni***
Enter second topping: ***Mushrooms***
Enter third topping: ***Bacon***
Choose a drink (Water, Soda, Juice): ***Juice***
Would you like a dessert? (Brownie, Cookie, Cheesecake, None): ***Cheesecake***
Do you have a discount code? (Yes/No): ***No***

Your order:
- Large Pizza: $20.00
- Pepperoni Topping: $2.50
- Mushrooms Topping: $2.00
- Bacon Topping: $3.00
- Drink: Juice ($3.00)
- Dessert: Cheesecake ($5.00)
- 10% discount on pizza applied: -$2.75
Final Total: $32.75

Sample Run 3

Choose pizza size (Small/Medium/Large): ***Small***
How many toppings would you like? (1-3): ***3***

```
Enter first topping (Cheese, Pepperoni, Mushrooms, Olives,
Bacon, Peppers): Pepperoni
Enter second topping: Mushrooms
Enter third topping: Bacon
Choose a drink (Water, Soda, Juice): Juice
Would you like a dessert? (Brownie, Cookie, Cheesecake,
None): Cheesecake
Do you have a discount code? (Yes/No): Yes

Your order:
- Small Pizza: $10.00
- Pepperoni Topping: $2.50
- Mushrooms Topping: $2.00
- Bacon Topping: $3.00
- Drink: Juice ($3.00)
- Dessert: Cheesecake ($5.00)
- 10% discount on pizza applied: -$1.75
- Discount code applied: -$5.00
Final Total: $18.75
```

General Rules and Guidelines about Homework

The following rules and guidelines will be applicable to all homework unless otherwise noted.

How to get help?

You may ask questions to TAs (Teaching Assistants) or LAs (Learning Assistants) of CS201. Office hours of TAs/LAs are at the SUCourse.

What and Where to Submit

You can prepare (or at least test) your program using MS Visual Studio 2022 C++ (Windows users) or using XCode (macOS users).

- Your code will be automatically graded using SUCourse. Therefore, it is essential that you ensure your output matches the exact same outputs given in the example test cases provided by SUCourse.
- After writing your code, use the "Check" button located under the code editor in SUCourse to see your grade based on the example test cases used. This grade will give you an idea of how well your code is performing.
- Note that the example test cases used for checking your code are not the same as the ones used for grading your homework. Your final grade will be based on different test cases. Therefore, it is important that you carefully follow the instructions and ensure that your code is working correctly to achieve the best possible grade on your homework assignment.
- To submit your homework, click on the "Finish attempt..." button and then the "Submit all and finish" button. If you wish to submit again before the due date, you can press the "Re-attempt quiz" button.

- Submit your work **through SUCourse only**! You will receive no credits if you submit by any other means (email, paper, etc.).

Grading, Review and Objections

Be careful about the automatic grading: Your programs will be graded using an automated system. Therefore, you should follow the guidelines on the input and output order. Moreover, It is important to use the exact same text as provided in the example test case outputs from SUCourse. Otherwise, the automated grading process will fail for your homework, and you may get a zero, or in the best scenario, you will lose points.

Grading:

- Late penalty is 10% of full grade (only 1 late day is allowed)
- Successful submission is one of the requirements of the homework. If, for some reason, you cannot successfully submit your homework and we cannot grade it, your grade will be 0.
- If your code does not work because of a syntax error, then we cannot grade it; and thus, your grade will be 0.
- Please submit your **own** work only. It is really easy to find "similar" programs!
- Plagiarism will not be tolerated. Please check our plagiarism policy given in the Syllabus.

Plagiarism will not be tolerated!

Grade announcements: Grades will be posted in SUCourse, and you will get an Announcement at the same time. You will find the grading policy and test cases in that announcement.

Grade objections: It is your right to object to your grade if you think there is a problem, but before making an objection please try the steps below and if you still think there is a problem, contact the TA that graded your homework from the email address provided in the comment section of your announced homework grade or attend the specified objection hour in your grade announcement.

- Check the comment section in the homework tab to see the problem with your homework.
- Check the test cases in the announcement and try them with your code.
- Compare your results with the given results in the announcement.

Good Luck!

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