

CSE 1321L: Programming and Problem Solving I Lab

Lab 4

Selection Structures

What students will learn:

- Logic using selection structures (if/else and switch statements)
- Review of I/O (input and output)
- Review of reading input from the user and storing it into variables
- Review of doing basic calculations with variables to generate a solution

Overview: In this lab, you're going to focus on *if*, *if-else*, and *else* statements, as well as *switch* statements. This lab is all about logic so you'll need to think through the problem.

As with previous weeks, all labs should have the appropriate class names and file names, Lab4A, Lab4B, Lab4C and Lab4D (.java, .cs, .cpp). You are not required to use repl.it for this set of labs unless you want more practice with it.

Lab4A: What is my grade?

First, we are going to start with a very simple question to understand use case of conditional statements. Imagine someone just got an exam grade back and was wondering what letter grade they would get. You should write a program that will prompt the user to input number grade they received on their exam and returns the letter grade they will get for that numerical grade that was entered.

Fractional numerical values (*90.5 is an acceptable input*) should also be accounted for.

Use the below table as a reference to determine which numerical grades correspond to which letter grades:

Letter Grade	Range
A+	98 - 100
A	95 - 97
A-	92 - 94
B+	89 - 91
B	86 - 88
B-	83 - 85
C+	80 - 82
C	77 - 79
C-	74 - 76
D+	71 - 73
D	68 - 70
D-	65 - 67
F	0 - 64

Remember, the class name should be Lab4A.

Sample runs are shown in the next page. The user input is in **bold**.

Sample run #1:

Enter the score of your exam: **96**

Letter grade is: A

Sample run #2:

Enter the score of your exam: **97.5**

Letter grade is: A+

Sample run #3:

Enter the score of your exam: **42**

Letter grade is: F

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Lab4B: Do I have class today?

We're going to create special messages for days of the week. For this lab, you will create a program that asks the user for a day of the week.

- If the user is going to have class on Monday and Wednesday, but also is really excited for Friday.
- Your program should respond with a special message for each of these days, keep in mind both Monday and Wednesday messages are the same and the user may or may not pay attention to capitalization.
- For other days, the program will print the message "I should use this time to do my homework."

Make sure that the program is NOT case sensitive i.e., for example "Monday" and "monday" should lead to same result

Remember, the class name should be Lab4B.

Sample runs are shown below. The user input is in **bold**.

Sample run #1:

```
Enter the day: Monday  
I have class today!
```

Sample run #2:

```
Enter the day: monday  
I have class today!
```

Sample run #3:

```
Enter the day: Friday  
It's Friday! Friday! Gotta get down on Friday!
```

Sample run #4 (generic case):

```
Enter the day: Tuesday  
I should use this time to do my homework.
```

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Lab4C: Creating a menu

For this lab exercise you are going to create a basic program which will allow the user to make a selection from a menu; selecting a different option from the menu should result in a different outcome.

For this lab, please use a **switch statement** for all possible options the user may input.

First, welcome the user with the welcome message (present in the sample runs below) that explains what the program does and what the user is expected to do. Next have the user input a number; based on the number inputted one of the various transformations must be performed.

If the user chooses to exit the program, display "Thank you, goodbye!". If the user inputs attempts to input a number that is not on the menu, display "Invalid input, please try again!"

Hints:

- Additive inverse of 5 is -5
- Reciprocal of 3 is 1/3
- There are some math functions to help with exponents (X^2 and X^3) however, you don't need to use them for this lab.

Remember, the class name should be Lab4C.

Sample runs are shown below. The user input is in **bold**.

Sample run #1:

Welcome!

Please input a number: **100**

What would you like to do to this number:

- 0) Get the additive inverse of the number
- 1) Get the reciprocal of the number
- 2) Square the number
- 3) Cube the number
- 4) Exit the program

0

The additive inverse of 100.0 is -100.0

Sample run #2:

Welcome!

Please input a number: **50**

What would you like to do to this number:

- 0) Get the additive inverse of the number
- 1) Get the reciprocal of the number
- 2) Square the number
- 3) Cube the number
- 4) Exit the program

1

The reciprocal of 50.0 is 0.02

Sample run #3:

Welcome!

Please input a number: **500**

What would you like to do to this number:

- 0) Get the additive inverse of the number
- 1) Get the reciprocal of the number
- 2) Square the number
- 3) Cube the number
- 4) Exit the program

2

The square of 500.0 is 250000.0

Sample run #4:

Welcome!

Please input a number: **9**

What would you like to do to this number:

- 0) Get the additive inverse of the number
- 1) Get the reciprocal of the number
- 2) Square the number
- 3) Cube the number
- 4) Exit the program

3

The cube of 9.0 is 729.0

Sample run #5:

Welcome!

Please input a number: **100**

What would you like to do to this number:

- 0) Get the additive inverse of the number
- 1) Get the reciprocal of the number
- 2) Square the number
- 3) Cube the number
- 4) Exit the program

4

Thank you, goodbye!

Sample run #6:

Welcome!

Please input a number: **100**

What would you like to do to this number:

- 0) Get the additive inverse of the number
- 1) Get the reciprocal of the number
- 2) Square the number
- 3) Cube the number

4) Exit the program

100

Invalid input, please try again!

Instructions:

- Programs must be working correctly.
- **Programs must be saved in files with the correct file name.**
- If working in Java or C#, class names must be correct.
- Programs must be working and checked by the end of the designated lab session.
- **Programs (only .java, .cs or .cpp files) must be uploaded to Gradescope by due date.**