



GIFT School of Engineering and Applied Sciences

Spring 2020

CS-124: Introduction to Programming - Lab

Lab-6 Manual

Decision Structures

Task #1: Drawing a flowchart and convert to code

In this task, you are being asked to draw a flowchart of the given problem, and then convert that flowchart into Java code.

Write a program that reads in three integers and prints “in order” if they are sorted in ascending *or* descending order, or “not in order” otherwise. For example,

1 2 5	in order
1 5 2	not in order
5 2 1	in order
1 2 2	in order

1. Create a program called **OrderingLab6.java**.
2. Create appropriate variables and assign values using a **Scanner** object.
3. Correctly display appropriate messages.

Task #2: Draw a flowchart and convert to code

In this task, you are being asked to draw a flowchart of the given problem, and then convert that flowchart into Java code.

Write a program that reads four integers and prints “two pairs” if the input consists of two matching pairs (in some order) and “no two pairs” otherwise. For example,

1 2 2 1	two pairs
1 2 2 3	no two pairs
2 2 2 2	two pairs

1. Create a program called **TwoPairsLab6.java**.
2. Create appropriate variables and assign values using a **Scanner** object.
3. Correctly display appropriate messages.

Task #3: Draw a flowchart and convert to code

In this task, you are being asked to draw a flowchart of the given problem, and then convert that flowchart into Java code.

Write a program that translates a letter grade into a number grade. Letter grades are A, B, C, D, and F, possibly followed by + or -. Their numeric values are 4, 3, 2, 1, and 0. There is no F+ or F-. + increases the numeric value by 0.3, a - decreases it by 0.3. However, an A+ has value 4.0.

Enter a letter grade: B
The numeric value is 2.7.

HINT: When using a **Scanner**, it always reads a **String**. So, when you enter a letter grade, such as **B** (without single quotes), it will read it as **"B"**, that is a String. You will need to convert that **String** into a **char**. To do this, you can use **charAt(0)**.

Note the below given example:

```
Scanner read = new Scanner(System.in);  
char letter;  
  
System.out.print("Please enter a single character: ");  
letter = read.nextLine().charAt(0);  
  
System.out.println("You entered: " + letter);
```

1. Create a program called **LetterGradeLab6.java**.
2. Create appropriate variables and assign values using a **Scanner** object.
3. Correctly display appropriate messages.

Task #4: Draw a flowchart and convert to code

In this task, you are being asked to draw a flowchart of the given problem, and then convert that flowchart into Java code.

Write a program that asks the user to enter a month (1 for January, 2 for February, etc.) and then prints the number of days in the month. For February, print “28 days”.

Enter a month: 5

30 days

Do not use a separate if/else branch for each month. Use Logical operators.

1. Create a program called **NumberOfDaysLab6.java**.
2. Create appropriate variables and assign values using a **Scanner** object.
3. Correctly display appropriate messages.

Task #5: Draw a flowchart and convert to code

In this task, you are being asked to draw a flowchart of the given problem, and then convert that flowchart into Java code.

A supermarket awards coupon depending on how much a customer spends on groceries. For example, if you spend \$50, you will get a coupon worth eight percent of that amount. The following table shows the percent used to calculate the coupon awarded for different amounts spent. Write a program that calculates and prints the value of the coupon a person can receive based on groceries purchased.

Here is a sample run:

Please enter the cost of your groceries: 14

You win a discount coupon of \$ 1.12. (8% of your purchase)

Money Spent	Coupon Percentage
Less than \$10	No coupon
From \$10 to \$60	8%
More than \$60 to \$150	10%
More than \$150 to \$210	12%
More than \$210	14%

1. Create a program called **DiscountCouponLab6.java**.
2. Create appropriate variables and assign values using a **Scanner** object.
3. Correctly display appropriate messages.

POST LAB TASK

Write a Java program that simulates a calculator. It first displays a menu like the one given below:

```
Press + for addition
Press - for subtraction
Press * for multiplication
Press / for division
Press % for remainder
Press S or s for square root
Press P or p for power
```

The program takes the **choice** and stores it in a **char** type variable. Based on the choice, prompt the user to enter two operands (two operands are required for all functions except square root) and then display the result of calculations. The operands must be of type **double**.

Rules:

1. If the user enters a choice other than the available ones, your program should display an error message and stop.
2. For division, if the second operand is **0**, display an error message “Division by Zero not allowed”
3. For square root, the program should take only one input i.e. first operand.