

Learner Assignment Submission Format

Learner Details

- **Name:**H O Akash
 - **Enrollment Number:**
 - **Batch / Class:**
 - **Assignment:** (Bridge Course Day 2)
 - **Date of Submission:**
-

Problem Solving Activity 2.1

1. Program Statement

Age Checker



2. Algorithm

1. Declare an integer variable myAge and assign a value to it.
 2. Use comparison operators to check the following conditions:
 - myAge is equal to 25.
 - myAge is greater than 18.
 - myAge is less than or equal to 65.
 - myAge is not equal to 30.
 3. Print the Boolean result of each expression.
-

3. Pseudocode

BEGIN

SET myAge = some value

PRINT "Is my age equal to 25? " + (myAge == 25)

PRINT "Is my age greater than 18? " + (myAge > 18)

```
PRINT "Is my age less than or equal to 65? " + (myAge <= 65)  
PRINT "Is my age not equal to 30? " + (myAge != 30)  
END
```

4. Program Code

```
public class D2_1 {  
  
    public static void main(String[] args) {  
  
        int myAge = 30;  
  
        System.out.println("Is my age equal to 25? " + (myAge == 25));  
        System.out.println("Is my age greater than 18? " + (myAge > 18));  
        System.out.println("Is my age less than or equal to 65? " + (myAge  
<= 65));  
        System.out.println("Is my age not equal to 30? " + (myAge != 30));  
    }  
}
```

5. Test Cases

Present a table of test cases you used to validate your program. Include a mix of regular, boundary, and edge cases.

Test Case No.	Input	Expected Output	Actual Output	Status (Pass/Fail)
1	30	false,true,true,fals e	false,true,true,f alse	pass
2	25	true,true,true,true	true,true,true,tr ue	pass
3	17	false,false,true,tru e	false,false,true, true	pass

6. Screenshots of Output

```
.\user3\akash\OneDrive\Desktop\stemupBridgecourse\Day
Is my age equal to 25? true
Is my age greater than 18? true
Is my age less than or equal to 65? true
Is my age not equal to 30? true
PS C:\Users\akash\OneDrive\Desktop\stemupBridgecourse\Day
PS C:\Users\akash\OneDrive\Desktop\stemupBridgecourse\Day
```

7. Observation / Reflection

This program demonstrates the use of comparison operators in Java to check different conditions. The comparison operators return a Boolean value (true or false) that can be printed directly.

Problem Solving Activity 2.2

1. Program Statement

Login Credentials

2. Algorithm

1. Declare the actual username and password.
2. Declare the entered username and password.
3. Use a logical AND operator (`&&`) to check if both the username and password match.
4. Store the result in a Boolean variable `isValidLogin`.
5. Print the result.



3. Pseudocode

```
BEGIN
    SET username = "akash"
    SET password = "akash123"
    SET enteredUsername = some value
    SET enteredPassword = some value
    SET isValidLogin = (username == enteredUsername) AND (password == enteredPassword)
    PRINT "Is login valid? " + isValidLogin
END
```

4. Program Code

```
public class D2_2 {  
  
    public static void main(String[] args) {  
  
        String username = "akash";  
  
        String password = "akash123";  
  
        String enteredUsername = "akash";  
  
        String enteredPassword = "akash123";  
  
        boolean isValidLogin = (username.equals(enteredUsername)) &&  
(password.equals(enteredPassword));  
  
        System.out.println("Is login valid? " + isValidLogin);  
    }  
}
```



5. Test Cases

Present a table of test cases you used to validate your program. Include a mix of regular, boundary, and edge cases.

Test Case No.	Input	Expected Output	Actual Output	Status (Pass/Fail)
1	same	true	true	pass
2	diff	false	false	pass

6. Screenshots of Output

```
java -jar loginvalidator.jar
11ebbf6fdfa1e36621edf6b\redhat.java
Is login valid? true
PS C:\Users\akash\OneDrive\Desktop\S
```



7. Observation / Reflection

This program demonstrates the use of logical operators in Java to check multiple conditions. The `&&` operator returns true only if both conditions are true.

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Problem Solving Activity 2.3

1. Program Statement

Find Number Range

2. Algorithm

1. Declare an integer variable num and assign a value to it.
 2. Use logical operators to check the following conditions:
 - num is greater than 10 AND less than 20.
 - num is less than 5 OR greater than 100.
 3. Store the results in Boolean variables.
 4. Print the results.
-



3. Pseudocode

```
BEGIN
  SET num = some value
  SET isBetween10And20 = (num > 10) AND (num < 20)
  SET isLessThan5OrGreaterThan100 = (num < 5) OR (num > 100)
  PRINT "Is num between 10 and 20? " + isBetween10And20
  PRINT "Is num less than 5 or greater than 100? " + isLessThan5OrGreaterThan100
END
```

4. Program Code

```
public class D3_3 {
    public static void main(String[] args) {
        int num = 15;
        boolean isBetween10And20 = (num > 10) && (num < 20);
```

```

        boolean isLessThan5OrGreaterThan100 = (num < 5) || (num > 100);

        System.out.println("Is num between 10 and 20? " + isBetween10And20);

        System.out.println("Is num less than 5 or greater than 100? " +
isLessThan5OrGreaterThan100);

    }

}

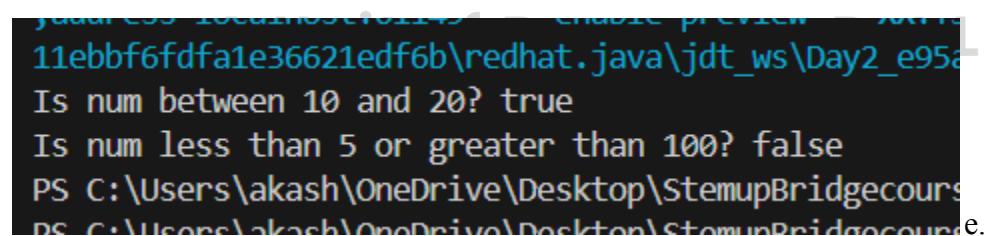
```

5. Test Cases

Present a table of test cases you used to validate your program. Include a mix of regular, boundary, and edge cases.

Test Case No.	Input	Expected Output	Actual Output	Status (Pass/Fail)
1	15	true,false	true,false	pass
2	4	false,true	false,true	pass
3	65	false,false	false,false	pass

6. Screenshots of Output



```

ydaa.css localhost:8080 - Enable preview - www
11ebbf6fdfa1e36621edf6b\redhat.java\jdt_ws\Day2_e95a
Is num between 10 and 20? true
Is num less than 5 or greater than 100? false
PS C:\Users\akash\OneDrive\Desktop\StemupBridgecourse
PS C:\Users\akash\OneDrive\Desktop\StemupBridgecourse>

```

7. Observation / Reflection

This program demonstrates the use of logical operators (`&&` and `||`) in Java to check multiple conditions. The `&&` operator returns true only if both conditions are true, while the `||` operator returns true if at least one condition is true.

Problem Solving Activity 2.4

1. Program Statement

Operator Precedence Challenge

Given the expression: $5+3*2>10\&\&! (7==7)$

4. Solution

$5+3*2>10\&\&! (7==7)$

$5+3*2>10\&\&! (\text{true})$

$5+3*2>10\&\&\text{false}$

$5+6>10\&\&\text{false}$

$11>10\&\&\text{false}$

$\text{true}\&\&\text{false}$

false



7. Observation / Reflection

This challenge demonstrates the importance of operator precedence in programming. The order in which operators are evaluated can significantly affect the result of an expression.

Problem Solving Activity 2.5

1. Program Statement

Check positive, negative or zero

2. Algorithm

1. Get an integer input from the user.
2. Use an if-else if-else structure to determine the sign of the number:
 - If the number is greater than 0, print "Positive".
 - If the number is less than 0, print "Negative".
 - If the number is exactly 0, print "Zero".



3. Pseudocode

```
BEGIN
    INPUT num
    IF num > 0
        PRINT "Positive"
    ELSE IF num < 0
        PRINT "Negative"
    ELSE
        PRINT "Zero"
END
```

4. Program Code

```
import java.util.Scanner;

public class D2_5 {
    public static void main(String[] args) {
```

```

Scanner scanner = new Scanner(System.in);

System.out.print("Enter an integer: ");

int num = scanner.nextInt();

scanner.close();

if (num > 0) {

    System.out.println("Positive");

} else if (num < 0) {

    System.out.println("Negative");

} else {

    System.out.println("Zero");

}

}
}

```

5. Test Cases

Present a table of test cases you used to validate your program. Include a mix of regular, boundary, and edge cases.

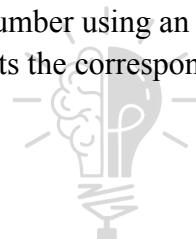
Test Case No.	Input	Expected Output	Actual Output	Status (Pass/Fail)
1	-4	negative	negative	pass
2	5	positive	positive	pass
3	0	zero	zero	pass

6. Screenshots of Output

```
,address=localhost:61703' '--en  
11ebbf6fdfa1e36621edf6b\redhat.  
Enter an integer: -4  
Negative  
PS C:\Users\akash\OneDrive\Desktop
```

7. Observation / Reflection

This program demonstrates a simple way to determine the sign of a number using an if-else if-else structure. The structure checks the conditions in order and prints the corresponding result.



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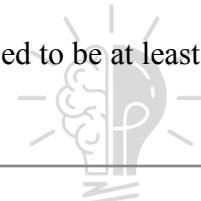
Problem Solving Activity 2.6

1. Program Statement

Eligibility checking for driving

2. Algorithm

1. Get the user's age as input.
2. Use an if-else structure to determine if the user is eligible to drive:
 - If the age is 18 or above, print "You are eligible to drive."
 - If the age is below 18, print "You are not eligible to drive. You need to be at least 18 years old."



3. Pseudocode

```
BEGIN
    INPUT age
    IF age >= 18
        PRINT "You are eligible to drive."
    ELSE
        PRINT "You are not eligible to drive. You need to be at least 18 years old."
    END
```

4. Program Code

```
import java.util.Scanner;

public class D2_6 {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
```

```

System.out.print("Enter your age: ");

int age = scanner.nextInt();

scanner.close();

if (age >= 18) {

    System.out.println("You are eligible to drive.");

} else {

    System.out.println("You are not eligible to drive. You need to
be at least 18 years old.");

}

}
}

```

5. Test Cases

Present a table of test cases you used to validate your program. Include a mix of regular, boundary, and edge cases.

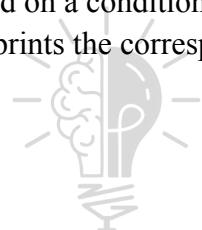
Test Case No.	Input	Expected Output	Actual Output	Status (Pass/Fail)
1	19	You are eligible to drive	You are eligible to drive	pass
2	15	You are not eligible to drive.	You are not eligible to drive.	pass
3	18	You are eligible to drive	You are eligible to drive	pass

6. Screenshots of Output

```
:\\Users\\akash\\AppData\\Roaming\\
Enter your age: 15
You are not eligible to drive.
PS C:\\Users\\akash\\OneDrive\\Des\\
PS C:\\Users\\akash\\OneDrive\\Des\\
```

7. Observation / Reflection

This program demonstrates a simple way to determine eligibility based on a condition ($age \geq 18$) using an if-else structure. The structure checks the condition and prints the corresponding result.



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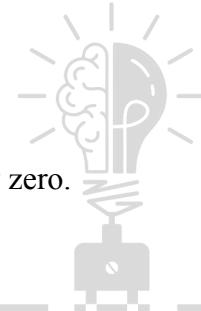
Problem Solving Activity 2.7

1. Program Statement

Simple calculator using if-else if-else

2. Algorithm

1. Get two double numbers and an operator from the user.
2. Use if-else if-else to perform the operation based on the operator:
 - If the operator is '+', add the numbers.
 - If the operator is '-', subtract the numbers.
 - If the operator is '*', multiply the numbers.
 - If the operator is '/', divide the numbers, but check for division by zero.
 - If the operator is none of the above, print an error message.



3. Pseudocode

```

BEGIN
  INPUT num1
  INPUT operator
  INPUT num2
  IF operator == '+'
    PRINT "Result: " + (num1 + num2)
  ELSE IF operator == '-'
    PRINT "Result: " + (num1 - num2)
  ELSE IF operator == '*'
    PRINT "Result: " + (num1 * num2)
  ELSE IF operator == '/'
    
```

```
IF num2 != 0
    PRINT "Result: " + (num1 / num2)
ELSE
    PRINT "Error: Division by zero is not allowed."
ELSE
    PRINT "Error: Invalid operator."
END
```

4. Program Code

```
import java.util.Scanner;

public class D2_7 {

    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter the first number: ");
        double num1 = scanner.nextDouble();
        System.out.print("Enter the operator (+, -, *, /): ");
        char operator = scanner.next().charAt(0);
        System.out.print("Enter the second number: ");
        double num2 = scanner.nextDouble();
        scanner.close();

        if (operator == '+') {
            System.out.println("Result: " + (num1 + num2));
        } else if (operator == '-') {
            System.out.println("Result: " + (num1 - num2));
        }
    }
}
```

```
    } else if (operator == '*') {  
  
        System.out.println("Result: " + (num1 * num2));  
  
    } else if (operator == '/') {  
  
        if (num2 != 0) {  
  
            System.out.println("Result: " + (num1 / num2));  
  
        } else {  
  
            System.out.println("Error: Division by zero is not  
allowed.");  
  
        }  
  
    } else {  
  
        System.out.println("Error: Invalid operator.");  
  
    }  
  
}
```

5. Test Cases

Present a table of test cases you used to validate your program. Include a mix of regular, boundary, and edge cases.

Test Case No.	Input	Expected Output	Actual Output	Status (Pass/Fail)
1	5,/,0	Error: Division by zero is not allowed.	Error: Division by zero is not allowed.	pass
2	5,*,3	15	15	pass
3	6,-,3	3	3	pass

6. Screenshots of Output

```
11ebbf6fdfa1e36621edf6b\redhat.java\jdt_1
Enter the first number: 5
Enter the operator (+, -, *, /): /
Enter the second number: 0
Error: Division by zero is not allowed.
PS C:\Users\akash\OneDrive\Desktop\Stemu
```

7. Observation / Reflection

This program demonstrates a simple way to implement a calculator using if-else if-else structure. The program handles division by zero and invalid operators.



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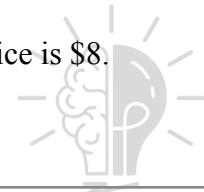
Problem Solving Activity 2.8

1. Program Statement

Movie ticket price based on their age.

2. Algorithm

1. Get the user's age and student status as input.
2. Use nested if or logical operators to determine the movie ticket price:
 - If the user is under 5 or over 65, the price is \$5.
 - If the user is between 5 and 18 (inclusive) and is a student, the price is \$8.
 - Otherwise, the price is \$12.



3. Pseudocode

```
BEGIN
    INPUT age
    INPUT isStudent
    IF age < 5 OR age > 65
        price = 5.0
    ELSE IF age >= 5 AND age <= 18 AND isStudent
        price = 8.0
    ELSE
        price = 12.0
    PRINT "The movie ticket price is: $" + price
END
```

4. Program Code

```
import java.util.Scanner;

public class D2_8 {

    public static void main(String[] args) {

        Scanner scanner = new Scanner(System.in);

        System.out.print("Enter your age: ");

        int age = scanner.nextInt();

        System.out.print("Are you a student? (true/false): ");

        boolean isStudent = scanner.nextBoolean();

        scanner.close();

        double price;

        if (age < 5 || age > 65) {

            price = 5.0;

        } else if (age >= 5 && age <= 18 && isStudent) {

            price = 8.0;

        } else {

            price = 12.0;

        }

        System.out.println("The movie ticket price is: $" + price);

    }

}
```

5. Test Cases

Present a table of test cases you used to validate your program. Include a mix of regular, boundary, and edge cases.

Test Case No.	Input	Expected Output	Actual Output	Status (Pass/Fail)
1	4,true	\$5	\$5	pass
2	66,false	\$5	\$5	pass
3	35,false	\$12	\$12	pass

6. Screenshots of Output

```
Enter your age: 66
Are you a student? (true/false): false
The movie ticket price is: $5.0
PS C:\Users\akash\OneDrive\Desktop\Stemup
PS C:\Users\akash\OneDrive\Desktop\Stemup
```



7. Observation / Reflection

This program demonstrates a simple way to determine the movie ticket price based on the user's age and student status. The program uses logical operators to combine conditions and determine the price.

Problem Solving Activity 2.9

1. Program Statement

Find the day of the week depending on number(1-7).

2. Algorithm

1. Get the user's input as an integer.
2. Use a switch statement to determine the corresponding day of the week:
 - Each case corresponds to a specific day (1 = Sunday, 3 = Tuesday, etc.).
 - The default case handles invalid inputs.



3. Pseudocode

```
BEGIN
    INPUT day
    SWITCH day
        CASE 1: PRINT "Sunday"
        CASE 2: PRINT "Monday"
        CASE 3: PRINT "Tuesday"
        CASE 4: PRINT "Wednesday"
        CASE 5: PRINT "Thursday"
        CASE 6: PRINT "Friday"
        CASE 7: PRINT "Saturday"
    DEFAULT: PRINT "Invalid input. Please enter a number between 1 and 7."
END
```

4. Program Code

```
import java.util.Scanner;

public class D2_9 {

    public static void main(String[] args) {

        Scanner scanner = new Scanner(System.in);

        System.out.print("Enter a number (1-7): ");

        int day = scanner.nextInt();

        scanner.close();

        switch (day) {

            case 1:

                System.out.println("Sunday");

                break;

            case 2:

                System.out.println("Monday");

                break;

            case 3:

                System.out.println("Tuesday");

                break;

            case 4:

                System.out.println("Wednesday");

                break;

            case 5:

                System.out.println("Thursday");
        }
    }
}
```

```

        break;

    case 6:

        System.out.println("Friday");

        break;

    case 7:

        System.out.println("Saturday");

        break;

    default:

        System.out.println("Invalid input. Please enter a number
between 1 and 7.");

    }

}

}

```

5. Test Cases

Present a table of test cases you used to validate your program. Include a mix of regular, boundary, and edge cases.

Test Case No.	Input	Expected Output	Actual Output	Status (Pass/Fail)
1	1	sunday	sunday	pass
2	5	Thursday	Thursday	pass
3	8	Invalid input. Please enter a number between 1 and 7.	Invalid input. Please enter a number between 1 and 7.	pass

6. Screenshots of Output

```
C:\Users\akash\OneDrive\Documents> Enter a number (1-7): 1
Sunday
PS C:\Users\akash\OneDrive\De
PS C:\Users\akash\OneDrive\De
```

7. Observation / Reflection

This program demonstrates a simple way to use a switch statement to determine the day of the week based on the user's input. The switch statement makes the code more readable and efficient.



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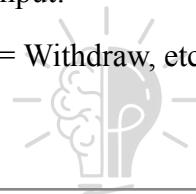
Problem Solving Activity 2.10

1. Program Statement

Simple Menu Selection, Simulate an ATM.

2. Algorithm

1. Display the ATM menu to the user.
2. Get the user's input as an integer.
3. Use a switch statement to determine the action based on the user's input:
 - Each case corresponds to a specific action (1 = Check Balance, 2 = Withdraw, etc.).
 - The default case handles invalid inputs.



3. Pseudocode

```
BEGIN
    DISPLAY "ATM Menu:"
    DISPLAY "1. Check Balance"
    DISPLAY "2. Withdraw"
    DISPLAY "3. Deposit"
    DISPLAY "4. Exit"

    INPUT choice

    SWITCH choice
        CASE 1: PRINT "You have chosen to check your balance."
        CASE 2: PRINT "You have chosen to withdraw money."
        CASE 3: PRINT "You have chosen to deposit money."
        CASE 4: PRINT "Exiting..."

    DEFAULT: PRINT "Invalid choice. Please try again."
```

END

4. Program Code

```
import java.util.Scanner;

public class D2_10 {

    public static void main(String[] args) {

        Scanner scanner = new Scanner(System.in);

        System.out.println("ATM Menu:");
        System.out.println("1. Check Balance");
        System.out.println("2. Withdraw");
        System.out.println("3. Deposit");
        System.out.println("4. Exit");

        System.out.print("Enter your choice: ");
        int choice = scanner.nextInt();

        scanner.close();

        switch (choice) {
            case 1:
                System.out.println("You have chosen to check your
balance.");
                break;
            case 2:
                System.out.println("You have chosen to withdraw money.");
                break;
            case 3:
                System.out.println("You have chosen to deposit money.");
        }
    }
}
```

```

        break;

    case 4:

        System.out.println("Exiting...");

        break;

    default:

        System.out.println("Invalid choice. Please try again.");

    }

}

}

```

5. Test Cases

Present a table of test cases you used to validate your program. Include a mix of regular, boundary, and edge cases.

Test Case No.	Input	Expected Output	Actual Output	Status (Pass/Fail)
1	1	You have chosen to check your balance.	You have chosen to check your balance.	pass
2	4	exiting	exiting	pass
3	6	Invalid choice. Please try again.	Invalid choice. Please try again.	pass

6. Screenshots of Output

```
: \Users\akash\AppData\Roaming\Code\US
ATM Menu:
1. Check Balance
2. Withdraw
3. Deposit
4. Exit
Enter your choice: 6
Invalid choice. Please try again.
PS C:\Users\akash\OneDrive\Desktop\St
```

7. Observation / Reflection

This program demonstrates a simple way to use a switch statement to handle menu selections. The switch statement makes the code more readable and efficient.



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Problem Solving Activity 2.11

1. Program Statement

Grade Remarks using if-else if-else to print and know why switch is not ideal.

2. Algorithm

1. Get the score as input.
 2. Use if-else if-else to determine the grade remarks based on the score:
 - Each condition corresponds to a specific grade range.
-

3. Pseudocode

```
BEGIN  
    INPUT score  
  
    IF score >= 90 AND score <= 100  
        PRINT "Excellent"  
    ELSE IF score >= 80 AND score <= 89  
        PRINT "Very Good"  
    ELSE IF score >= 70 AND score <= 79  
        PRINT "Good"  
    ELSE IF score >= 60 AND score <= 69  
        PRINT "Pass"  
    ELSE IF score >= 0 AND score < 60  
        PRINT "Fail"  
    ELSE  
        PRINT "Invalid score. Please enter a score between 0 and 100."  
END
```



4. Program Code

```
import java.util.Scanner;

public class D2_11 {

    public static void main(String[] args) {

        Scanner scanner = new Scanner(System.in);

        System.out.print("Enter your score (0-100): ");

        int score = scanner.nextInt();

        scanner.close();

        if (score >= 90 && score <= 100) {
            System.out.println("Excellent");
        } else if (score >= 80 && score <= 89) {
            System.out.println("Very Good");
        } else if (score >= 70 && score <= 79) {
            System.out.println("Good");
        } else if (score >= 60 && score <= 69) {
            System.out.println("Pass");
        } else if (score >= 0 && score < 60) {
            System.out.println("Fail");
        } else {
            System.out.println("Invalid score. Please enter a score between 0 and 100.");
        }
    }
}
```

```
}
```

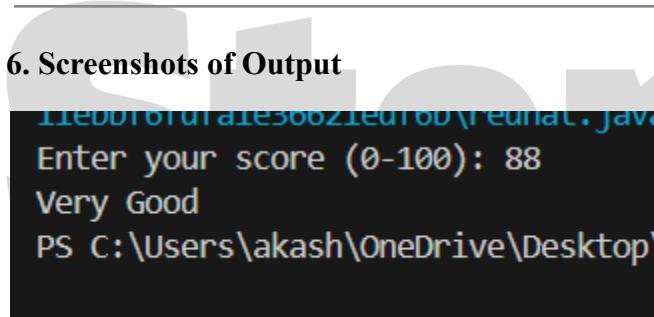
```
}
```

5. Test Cases

Present a table of test cases you used to validate your program. Include a mix of regular, boundary, and edge cases.

Test Case No.	Input	Expected Output	Actual Output	Status (Pass/Fail)
1	88	Very Good	Very Good	pass
2	20	Fail	Fail	pass
3	104	Invalid score. Please enter a score between 0 and 100	Invalid score. Please enter a score between 0 and 100	pass 

6. Screenshots of Output



```
java ScoreEvaluation.java
```

```
Enter your score (0-100): 88
```

```
Very Good
```

```
PS C:\Users\akash\OneDrive\Desktop\
```

7. Observation / Reflection

A switch statement would not be ideal for this problem because it is designed to handle exact matches, whereas this problem requires handling ranges of values. The if-else if-else structure is more suitable for this problem because it allows us to specify conditions that involve ranges of values.



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