1. Write a program that takes a student's score as input and outputs the corresponding grade based on the following scale:

A: 90-100

B: 80-89

C: 70-79

D: 60-69

F: 0-59

Code:

```
package Students;

import java.util.Scanner;

public class GradeCalculator {
	public static void main(String[] args) {
		// Create a Scanner object to take input from the user
		Scanner scanner = new Scanner(System.in);

		// enter the student's score
		System.out.print("Enter the student's score: ");
		int score = scanner.nextInt();

		// Declare a variable to store the grade
		char grade;

		// Determine the grade based on the score
		if (score >= 90 && score <= 100) {
			grade = 'A'; // Score is between 90 and 100
		} else if (score >= 80 && score <= 89) {
			grade = 'B'; // Score is between 80 and 89
		} else if (score >= 70 && score <= 79) {
			grade = 'C'; // Score is between 70 and 79
		} else if (score >= 60 && score <= 69) {
			grade = 'D'; // Score is between 60 and 69
		} else if (score >= 0 && score <= 59) {
			grade = 'F'; // Score is between 0 and 59
		} else {
			// If the score is not within the valid range, print an error message
			System.out.println("Invalid score. Please enter a score between 0 and
100.");
			return; // Exit the program
		}

		// Print the corresponding grade
		System.out.println("The grade is: " + grade);
	}
}
```

Output:

```
<terminated> GradeCalculator [Java Applic
Enter the student's score: 80
The grade is: B
```

2. Write a program to check if a given year is a leap year. (A year is a leap year if it is divisible by 4 but not by 100, or it is divisible by 400.)

Code:

```
package Leap;

import java.util.Scanner;

public class LeapYear {
	public static void main(String[] args) {
		// Create a Scanner object to take input from the user
		Scanner scanner = new Scanner(System.in);

		// the user to enter a year
		System.out.print("Enter a year: ");
		int year = scanner.nextInt();

		// Determine if the year is a leap year
		boolean isLeapYear;

		// Check if the year is divisible by 4 but not by 100, or divisible by 400
		if (year % 4 == 0) {
			if (year % 100 == 0) {
				if (year % 400 == 0) {
					isLeapYear = true;
				} else {
					isLeapYear = false;
				}
			} else {
				isLeapYear = true;
			}
		} else {
			isLeapYear = false;
		}

		// Print the result
		if (isLeapYear) {
			System.out.println(year + " is a leap year.");
		} else {
			System.out.println(year + " is not a leap year.");
		}
	}
}
```

Output:

```
<terminated> LeapYear [Java Ap
Enter a year: 23
23 is not a leap year.
```

3. Write a program that takes an integer as input and checks if it is positive, negative, or zero.

Code:

```
package NumberCheck;

import java.util.Scanner;

public class NumberChecker {
	public static void main(String[] args) {
		// Create a Scanner object to take input from the user
		Scanner scanner = new Scanner(System.in);

		//  the user to enter an integer
		System.out.print("Enter an integer: ");
		int number = scanner.nextInt();

		// Check if the number is positive, negative, or zero
		if (number > 0) {
			System.out.println("The number is positive.");
		} else if (number < 0) {
			System.out.println("The number is negative.");
		} else {
			System.out.println("The number is zero.");
		}
	}
}
```

Output:

```
<terminated> NumberChecker [Java
Enter an integer: -10
The number is negative.
```

4. Write a program that prints numbers from 1 to 10 using a loop.

Code:

```
package Print;

public class PrintNumber {
	public static void main(String[] args) {
		// Loop to print numbers from 1 to 10
		for (int i = 1; i <= 10; i++) {
			System.out.println(i);
		}
	}
}
```

Output:

```
<terminated> Pr
1
2
3
4
5
6
7
8
9
10
```

5. Write a program that takes an integer N as input and calculates the sum of entered numbers.

Code:

```
package Sum;

import java.util.Scanner;

public class SumofNumber {
	public static void main(String[] args) {
		// Create a Scanner object to take input from the user
		Scanner scanner = new Scanner(System.in);

		//  user to enter the number of integers to sum
		System.out.print("Enter the number of integers you want to sum: ");
		int N = scanner.nextInt();

		//  variable to store the sum
		int sum = 0;
```

```
		// Loop to take N integers as input and calculate the sum
		for (int i = 1; i <= N; i++) {
			System.out.print("Enter number " + i + ": ");
			int number = scanner.nextInt();
			sum += number;  // Add the entered number to the sum
		}

		// Print the result
		System.out.println("The sum of the entered numbers is: " + sum);
	}
}
```

Output:

```
<terminated> SumofNumber [Java Application] C:\Users\Mr. User\
Enter the number of integers you want to sum: 1
Enter number 1: 100
The sum of the entered numbers is: 100
```

6. Write a program that takes an integer as input and prints its multiplication table up to 10.

Code:

```
package Table;

import java.util.Scanner;

public class MultiphicationTable {
	public static void main(String[] args) {
		// Create a Scanner object to take input from the user
		Scanner scanner = new Scanner(System.in);

		// Prompt the user to enter an integer
		System.out.print("Enter an integer: ");
		int number = scanner.nextInt();

		// Loop to print the multiplication table up to 10
		System.out.println("Multiplication table for " + number + ":");
		for (int i = 1; i <= 10; i++) {
			System.out.println(number + " x " + i + " = " + (number * i));
		}
	}
}
```

Output:

```
<terminated> MultiphicationTable [Ja
Enter an integer: 5
Multiplication table for 5:
5 x 1 = 5
5 x 2 = 10
5 x 3 = 15
5 x 4 = 20
5 x 5 = 25
5 x 6 = 30
5 x 7 = 35
5 x 8 = 40
5 x 9 = 45
5 x 10 = 50
```

7. Write a program that takes a positive integer as input and prints its digits in reverse order.

Code:

```
package Reverse;

import java.util.Scanner;

public class ReverseDigits {
	public static void main(String[] args) {
		// Create a Scanner object to take input from the user
		Scanner scanner = new Scanner(System.in);

		//  the user to enter a positive integer
		System.out.print("Enter a positive integer: ");
		int number = scanner.nextInt();

		// Validate that the number is positive
		if (number <= 0) {
			System.out.println("Invalid input. Please enter a positive integer.");
			return;
		}

		// Convert the number to a string to reverse its digits
		String numberStr = String.valueOf(number);

		// Reverse the string
		StringBuilder reversedStr = new StringBuilder(numberStr).reverse();

		// Print the reversed digits
		System.out.println("Digits in reverse order: " + reversedStr);
	}
}
```

Output:

```
<terminated> ReverseDigits (1) [Java App
Enter a positive integer: 10
Digits in reverse order: 01
```

8. Create a class Animal with a method makeSound() that prints "Some generic animal sound". Create another class Dog that extends Animal and overrides the makeSound() method to print "Bark". Write a main method to demonstrate calling the makeSound() method on an Animal reference holding a Dog object.

Code:

```
package Sounds;

//Animal class
class Animal {
	// Method to make sound
	public void makeSound() {
		System.out.println("Some animal sound");
	}
}

//Dog class extending Animal
class Dog extends Animal {
	// Override makeSound method to bark
	@Override
	public void makeSound() {
		System.out.println("Bark");
	}
}

//Main class
public class MakeSound {
	public static void main(String[] args) {
		// Create an Animal reference holding a Dog object
		Animal animal = new Dog();
		// Call makeSound method
		animal.makeSound();
	}
}
```

Output: