**Loops in Java: Short Notes**

Loops in Java are control flow structures that allow you to execute a block of code repeatedly as long as a condition is true. Java provides three main types of loops: `for`, `while`, and `do-while`.

1. For Loop:

- Syntax:

```java

for (initialization; condition; update) {

// code to be executed

}

```

- The `initialization` is executed once at the beginning.

- The `condition` is evaluated before each iteration. If it's true, the loop continues; otherwise, it terminates.

- The `update` statement is executed after each iteration.

- Example:

```java

for (int i = 0; i < 5; i++) {

System.out.println("Iteration: " + i);

}

```

2. While Loop:

- Syntax:

```java

while (condition) {

// code to be executed

}

```

- The `condition` is evaluated before the execution of the loop. If it's true, the loop continues; otherwise, it terminates.

- Example:

```java

int i = 0;

while (i < 5) {

System.out.println("Iteration: " + i);

i++;

}

```

3. Do-While Loop:

- Syntax:

```java

do {

// code to be executed

} while (condition);

```

- Unlike the `while` loop, the `do-while` loop executes its code block at least once before evaluating the condition.

- Example:

```java

int i = 0;

do {

System.out.println("Iteration: " + i);

i++;

} while (i < 5);

```

4. **Loop Control Statements:**

- `break`: Terminates the loop immediately.

- `continue`: Skips the rest of the code inside the loop for the current iteration and proceeds to the next iteration.

- Example:

```java

for (int i = 0; i < 10; i++) {

if (i == 5) {

break; // exits the loop when i equals 5

}

if (i % 2 == 0) {

continue; // skips even numbers

}

System.out.println(i);

}

```

Loops provide a powerful mechanism for repetitive tasks in Java, allowing developers to write more efficient and concise code.

**Problems with solutions**

Write a program to find the factorial value of any number entered through the keyboard.

import java.util.Scanner;

public class FactorialDemo1

{

public static void main(String[] args)

{

Scanner sc = new Scanner(System.in);

int num; // To hold number

int fact = 1; // To hold factorial

System.out.print("Enter any positive integer: ");

num = sc.nextInt();

for(int i=1; i<=num; i++)

{

fact \*= i;

}

System.out.println("Factorial: "+ fact);

}

}

Write a program that prompts the user to input an integer and then outputs the number with the digits reversed. For example, if the input is 12345, the output should be 54321.

import java.util.Scanner;

public class ReverseNumber

{

public static void main(String[] args)

{

Scanner sc = new Scanner(System.in);

int number;

int reverse = 0;

System.out.print("Enter the number ");

number = sc.nextInt();

int temp = number;

int remainder = 0;

while(temp>0)

{

remainder = temp % 10;

reverse = reverse \* 10 + remainder;

temp /= 10;

}

System.out.println("Reverse of " + number + " is " + reverse);

}

}

Write a program to print Fibonacci series of n terms where n is input by user :  
0 1 1 2 3 5 8 13 24 .....

Show the answer.

import java.util.Scanner;

public class FibonacciSeries

{

public static void main(String[] args)

{

Scanner sc = new Scanner(System.in);

int number; // To hold number of terms

int firstTerm = 0,

secondTerm = 1,

thirdTerm;

System.out.print("Enter number of terms of series : ");

number = sc.nextInt();

System.out.print(firstTerm + " " + secondTerm + " ");

for(int i = 3; i <= number; i++)

{

thirdTerm = firstTerm + secondTerm;

System.out.print(thirdTerm + " ");

firstTerm = secondTerm;

secondTerm = thirdTerm;

}

}

}

Write a program to print following :

1

222

33333

4444444

555555555

1

212

32123

4321234

543212345