Develop a program to print the first 10 perfect squares using a **while** loop. Break the loop if a square exceeds 100.

public class PerfectSquares {

public static void main(String[] args) {

int count = 0;

int number = 1;

while (count < 10) {

int square = number \* number;

if (square > 100) {

break;

}

System.out.println(square);

number++;

count++;

}

}

}

Here's a line-by-line explanation of the code:

1. Class and Main Method:

* public class PerfectSquares { ... }
  + This defines a class named PerfectSquares.
* public static void main(String[] args) { ... }
  + This is the main method, where the program execution begins.

2. Initializing Variables:

* int count = 0;
  + This initializes a variable count to 0 to keep track of the number of perfect squares printed.
* int number = 1;
  + This initializes a variable number to 1, starting from which the squares will be calculated.

3. While Loop:

* while (count < 10) { ... }
  + This loop continues as long as count is less than 10, ensuring that we print only 10 perfect squares.

4. Calculating Square:

* int square = number \* number;
  + This calculates the square of the current number and stores it in the square variable.

5. Checking Square Condition:

* if (square > 100) { break; }
  + If the calculated square is greater than 100, the loop is terminated using the break statement.

6. Printing Square:

* System.out.println(square);
  + If the square is within the desired range (not greater than 100), it is printed to the console.

7. Incrementing Variables:

* number++;
  + This increments number by 1 to move to the next number for calculating the next square.
* count++;
  + This increments count by 1 to keep track of the number of squares printed.

Key Points:

* The while loop ensures that the code finds and prints perfect squares until either 10 squares are printed or a square exceeds 100.
* The break statement is used to exit the loop prematurely if a square exceeds the limit, preventing unnecessary calculations.
* The output of the program will be the first 10 perfect squares (1, 4, 9, 16, 25, 36, 49, 64, 81, 100) printed on separate lines.