



SCANNER (INTEGERS)

zyBook 1.2, Scanner API, Oracle - Java Tutorial: Scanning

SCANNER

- What does a Scanner do?
 - **Reads input** from various sources (console, files, etc.) and turns the input into data that can be used by your program. For now, we will read from the console window.
- What is the benefit of a Scanner?
 - **Interactive** programs!

INTERACTIVE PROGRAMS

- Interactive programs
 - print messages to the user
 - accept user input.
- Challenges
 - Computers and users “think” differently
 - Users make mistakes

INTERACTIVE PROGRAMS

- User output: `System.out`
 - `print` and `println` methods print text to the console window
 - Uses standard out
- User input: `System.in`
 - Not intended to be used directly
 - Uses standard in
 - Use the `Scanner` class to understand the user's input

IMPORTING CLASS – JAVA CLASS LIBRARIES

- To use Scanner, need to **import** the class from the **Java Class Library**
 - Java Class Libraries: a set of Java classes available for you to use
 - Classes are organized into groups, which are called **packages**
- **Import declaration** – goes at the top of your program file
 - **import <package name>.*;**
 - **import java.util.Scanner;**

IMPORTING CLASS – SCANNER

- Requires import
 - `import java.util.*;`
 - `import java.util.Scanner;`
- Construction of Scanner for Console
 - `Scanner <name> = new Scanner(System.in);`
 - `Scanner in = new Scanner(System.in);`

SCANNER METHODS

Methods that can be run on Scanner objects.

Method	Description
<code>nextInt()</code>	Reads and returns user input as an int
<code>nextDouble()</code>	Reads and returns user input as a double
<code>next()</code>	Reads and returns user input as a String
<code>nextLine()</code>	Reads and returns and entire line of user input as a String

- Methods wait for user to type input and press <Enter>
- Value typed by user is returned to your program
- You want to **prompt the user for input**

TOKENS

- Token: a **single element** of input (e.g., one word, one number)
 - The Scanner object reads in user input as tokens
 - Tokens are separated by whitespace (spaces, tabs, newline characters)
- If the user's input does not match the expected token...
 - Program Crash!!!
 - **java.util.InputMismatchException**
 - We'll discuss how to avoid later


```
import java.util.*;

/**
 * Class gets input from users on the number of credit hours they are currently taking.
 *
 * @author Gina Bai
 */
public class CreditHour {

    public static void main(String[] args) {
        // Construct input scanner for console
        Scanner in = new Scanner(System.in);

        // Prompt user for credit hours
        System.out.println("How many credit hours are you currently taking?");

        // Read in the number of credit hours
        int creditHour = in.nextInt();

        // Print message
        System.out.println("You are currently taking " + creditHour + " credit hours.");
    }
}
```

Scans the next token of the input as an int

String concatenation in print statement

ERROR HANDLING

Throws:

- **InputMismatchException**
 - If the next token does not match the Integer regular expression, or out of range
- **NoSuchElementException**
 - If input is exhausted