

Simple Todo App

A command-line Java application for managing daily tasks, demonstrating fundamental Java object-oriented principles and data management.

Project Overview

This application demonstrates: - Object-Oriented Programming concepts - Java language basics (variables, data types, control flow) - Classes and Objects - Working with Numbers and Strings - Package structure - Collection management (ArrayList)

Features

- ■ Add tasks with descriptions - ■ View all tasks - ■ View pending tasks only - ■ View completed tasks only - ■ Mark tasks as complete/incomplete - ■■ Delete individual tasks - ■ View task statistics with progress bar - ■■ Clear all tasks - ■ In-memory data storage using ArrayList

Project Structure

```
Simple_todo_app/
├── src/
│   ├── com/
│   │   └── todoapp/
│   │       ├── Task.java           # Task class with properties and methods
│   │       ├── TaskManager.java    # Task management logic
│   │       └── TodoApp.java        # Main application class
│   ├── README.md
│   ├── .gitignore
│   └── compile.bat                # Windows batch file for compilation
```

Class Descriptions

Task.java

- Represents a single todo item - Properties: id, description, completion status - Methods: getters, setters, toString(), equals(), hashCode() - Demonstrates encapsulation and object-oriented design

TaskManager.java

- Manages collection of Task objects using ArrayList - Provides CRUD operations (Create, Read, Update, Delete) - Handles task filtering (completed/pending) - Demonstrates collection usage and data management

TodoApp.java

- Main application class with user interface - Command-line menu system - User input handling and validation - Demonstrates control flow, loops, and conditionals

How to Run

Prerequisites

- Java Development Kit (JDK) 8 or higher - Command line access (PowerShell, Command Prompt, or Terminal)

Compilation and Execution

1. Navigate to the project directory:
``powershell
cd "c:\Users\Samigold's Pc\Desktop\Simple_todo_app"
``
2. Compile the Java files:
``powershell
javac -d . src\com\todoapp*.java
``
3. Run the application:
``powershell
java com.todoapp.TODOApp
``

Using the Batch File (Windows)

.\compile.bat

Usage

1. Start the application - Run the main class
2. Add tasks - Choose option 1 and enter task descriptions
3. View tasks - Use options 2-4 to view different task lists
4. Mark complete - Use option 5 to complete tasks
5. Delete tasks - Use option 7 to remove tasks
6. View statistics - Use option 8 to see progress
7. Exit - Use option 0 to quit

Key Java Concepts Demonstrated

Object-Oriented Programming

- Encapsulation: Private fields with public getters/setters
- Abstraction: Task class abstracts task behavior
- Polymorphism: Override toString(), equals(), hashCode()

Data Types and Variables

- Primitive types: int, boolean
- Reference types: String, ArrayList
- Static variables: ID counter for unique task IDs

Control Flow

- Loops: for-each loops for iterating collections
- Conditionals: if-else statements for menu logic
- Switch statements: Menu option processing

Collections

- ArrayList: Dynamic array for storing tasks
- Iterator: Safe removal during iteration
- List interface: Programming to interfaces

Exception Handling

- NumberFormatException: Handling invalid number input
- IllegalArgumentException: Validating task descriptions

Sample Output

[illegible]

Future Enhancements

- File-based persistence (save/load tasks) - Task priorities and due dates - Categories and tags - Search and filter functionality - Task editing capabilities

Learning Objectives Achieved

■ Java syntax and language basics ■ Object-oriented programming principles ■ Class and object creation ■ Collection management (ArrayList) ■ String and number handling ■ Package organization ■ User input and validation ■ Control flow and program structure

License

This project is for educational purposes and demonstrates fundamental Java programming concepts.