**Enhancements Implemented**

1. Implement a Custom Linked List for Task Storage:
   * The TaskLinkedList class manages a dynamic list of tasks, allowing efficient insertion and deletion operations.
2. Implement Binary Search for Efficient Searching:
   * The TaskBinarySearch class uses binary search to efficiently find tasks by their ID, given that the tasks are sorted.
3. Implement Sorting Algorithm:
   * The TaskSorter class implements the merge sort algorithm to sort tasks by their names, ensuring efficient and stable sorting.
4. Use a Priority Queue for Task Management:
   * The TaskPriorityQueue class manages tasks based on their priority (task ID), ensuring that tasks with the highest priority are processed first.

**How to Compile the Task Management System Code**

To compile the Task management system code without running the application, follow these detailed steps:

**Prerequisites:**

* Ensure that the Java Development Kit (JDK) is installed on your system.
* Set up your environment variables to include JAVA\_HOME and add JAVA\_HOME/bin to your system's PATH.

**Step-by-Step Instructions:**

1. **Set Up Directory Structure:**
   * Open a terminal or command prompt.
   * Navigate to the directory where you want to create the project.
   * Create the main directory and navigate into it.

**Create Java Files and Add code:**

1. Inside the taskservice directory, create the following Java files:
   * Task.java
   * TaskLinkedList.java
   * TaskBinarySearch.java
   * TaskSorter.java
   * TaskPriorityQueue.java
   * TaskServiceCapStone.java
   * Main.java
2. Code is added to all Java files.
3. Compile the code.
   * Ensure you are in the taskservice directory:
   * Compile all Java files:

Below is the output:

A screenshot of a computer

Description automatically generated

A screenshot of a computer

Description automatically generated

**Test data to demonstrate the enhancements. 50 – 100 records**

A screenshot of a computer

Description automatically generated

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