

Metropolitan University of Tirana
Data Structures
Lists in Java (Advanced)

5.1 Word Frequency Counter

A word frequency counter program is important for automating the analysis of large amounts of text data by counting the frequency of each word in a given corpus. It provides insights into the most common words and topics in the corpus, which can be useful for content analysis.

Write a program that reads a large text file and uses a linked list to count the frequency of each word in the file. The program should output a list of words and their frequencies in descending order.

5.2 Stock Price Analysis

The program that finds the maximum profit from a list of daily stock prices is important for investors and traders who need to analyze and make decisions based on financial data.

Write a program that reads a list of daily stock prices and uses a linked list to find the maximum profit that could be made by buying and selling the stock on two different days. The program should output the maximum profit.

5.3 Songs Playlist

Write a program that maintains a linked list of songs in a playlist. Each song should have a title, artist, and duration. The program should support the following operations:

- Add song: Add a new song to the playlist.
- Remove song: Remove a song from the playlist.
- Play playlist: Output the list of songs in the playlist in order, including their titles, artists, and durations.
- Shuffle playlist: Output the list of songs in the playlist in a random order, including their titles, artists, and durations.
- Sort playlist by duration: Add a method that sorts the playlist by the duration of the songs, from shortest to longest. This can be implemented by writing a custom Comparator that compares two Song objects based on their duration, and then using the Collections.sort method to sort the playlist using the custom Comparator.
- Get total duration of playlist: Add a method that calculates and returns the total duration of the playlist in seconds.

What to submit:

All the code that we develop will be pushed to a GitHub repository. For that reason, make sure that you have (created) a GitHub account. Use `UMT_data_structures` for the repository name.