**Search Program Project**

**Requirements:**

1. Write Command Line interface for search sequence of integers in given matrix of integers rows.
2. Input matrix data should be private to the class.
3. Implement search functions for below criteria.
   1. Find all rows that have a specific sequence of numbers
   2. Find all rows that contain all the required numbers
   3. Find the row that has the closest match to a specific number sequence

And display the row numbers in console.

1. Allow to give multiple search sequence in input text file for processing.
2. Speed up search time

**Project Plan:**

**Sprint 1:  Design the search program - 2 days**

01. Class Design for the search program.

02. Setup Project and Git repository.

03. Implement code to process the input matrix data, sequence data and CLI.

04. Implement search program classes from design.

**Sprint 2: Create I/O for search program - 2 days**

05. Implement ordered search function.

06. Implement un-ordered search function.

07. Implement best match search function.

**Sprint 3: Implementation of search functions - 2 days**

08. Optimize the ordered search functions

**Sprint 4: Creating Test case and Reports - 2 days**

09. Create and implement the test cases for search program

10. Creating report on optimizing the search functionality and design of the project.

**Class Design for Search Program:**

In class design, created the “MatrixData” class for holding matrix and its rows and columns. Created “MatrixSearch” interface to implement the search methods.

As the requirement suggested user needs to provide with different search functionality which can be applied on input Matrix to find the rows where given sequence will be there. To accommodate different search functionality will be using the strategy design pattern as shown below. “OrderedSearch”, “UnorderedSearch” and “BestMatchSearch” classes are created and inherited from Interface “MatrixSearch”. And these classes will implement “SearchSequence()” Method to search the input sequence on matrix data.

“MatrixData” class is implemented with below methods.

1. GetMatrixSearch() – To get the proper matrix search class depending on the search type string.
2. IntializeMatrix() – Method to generate the matrix from given input strings.
3. SearchSequnence() – Method to initiate the search sequence methods on matrix using input sequence string.

