**Instructions**

**Summary**:

Write a Java program that reads in a text file containing the coordinates of two battleships.

Implement three different strategies (using the strategy design pattern) for locating the battleships (for

example: one search strategy could be to guess random numbers, one search strategy could be

incrementally horizontal, the third search strategy must be new/invented by you but it must be

relatively efficient).

Detailed Description: Create a data structure that represents a 25X25 grid.

You will use this grid to place the two battleships and to track the progress of your search for the

battleships.

1. **Read in Coordinates:**

Coordinates are stored in a file named “input.txt”.

Each line represents ONE game.

The following sample represents three different runs of the game.

For each game there is one carrier and one submarine.

The carrier occupies 5 cells.

The 5 cells of the carrier are represented by the first five coordinates in the line (below).

The submarine represents the remaining three coordinates. See example below:

2. Create a **25X25** grid and place the carrier and submarine onto the grid.

Game One: (0,0)(0,1)(0,2)(0,3)(0,4)(4,15)(4,16)(4,17)

The first 5 cells: (0,0)(0,1)(0,2)(0,3)(0,4) (**This is the Carrier**)

The last 3 cells: (4,15)(4,16)(4,17) (**This is the Submarine**)

3. **Create a BattleshipSearch class**

This class is responsible for searching the grid for both the carrier and the submarine.

(Note: Only reading the results from the input file and omitting the search step is not allowed).

**Read in the coordinates, place the ships, and then independently search for them.**

You must use a search strategy and will output the text shown at the bottom of the page to the

console for each game (with example coordinates from first row of text file).

For each game you will systematically use each of the following three search strategies.

4. **Create a family of search strategies.**

Make sure that you implement the strategy design pattern here.

a. **Horizontal Sweep Strategy:** Start at 0,0 and perform a systematic line-by-line sweep through

the grid until you have found both ships.

b. **Random Search Strategy**: Use the random number generator to randomly check coordinates

until you have found both ships.

c. **Strategic Search**: Figure out a more efficient search strategy and implement it as the third

strategy. See how efficient your approach can be. (Hint: A vertical sweep strategy would be equally as

inefficient as (a) so try to think of something better/more efficient)



5. **Repeat the game**

Repeat the game for each row in the input file.

**When the program is started, the searches will execute and print out the following**

**information (see screenshot below): (replace (0,0) with the correct coordinates in the input.txt**

**file):**

