

**CALIFORNIA STATE UNIVERSITY, SACRAMENTO**

College of Business Administration

MIS 211 - Information Systems II

## Homework 4 - Array Processing: Searches

Points: 45

Due Date: Wednesday, March 13

The objectives of this assignment are to familiarize you with array processing and two different sorts, binary and sequential. It involves building onto homework 3 and

- Creating a second subclass. One subclass will be used for the sequential search and the other for the binary search.
- Creating a method in the sequential search subclass that will perform a sequential search (refer to the flowchart in your class notes) ,
- Creating a method in the binary search subclass that will perform a binary search (refer to the flowchart in your class notes),
- Reading a second file (stocknum.dat) that contains stock numbers, and locating them in your arrays. The searches will either find or not find the stock numbers. Keep track of both the number of compares for each search and the total number of compares (for all searches).
- Printing the results of each search and the number of compares in a report (see sample output on the last page).

**Specifications**Classes and Subclasses

Use the class from the previous homework assignment (please refer to the assignment for the specifications). Rename your first subclass to a more descriptive title (i.e., binary search, sequential search) and declare a second subclass. All the methods and data of their class will be inherited into the subclass. However, data and methods unique to each subclass will have to be declared (within the subclass).

Variables:	Number of compares, total number of compares, subscripts
Methods:	Binary search (binary search subclass), Sequential search (sequential search subclass)
Objects:	Binary search (instantiated in the binary search subclass) Sequential search (instantiated in the sequential search subclass)



Inputs

The stocknum.dat file contains stock numbers that may either match or not match those in the stock number array. The stock numbers have been written to the file in random order. The field description is listed below:

Field	Data Type
Stock number	Double

Output

Add to your report and detail line from the previous homework assignment the following:

- Detail line. A message indicate whether the stock number (in stocknum.dat) was found or not, and the number of compares for each search.
- Report footing. The total number and the average number of compares for each search (average = total number of compares ÷ total number of records processed)

Processing

After instantiating your objects and loading their arrays (refer to the previous assignment), sequentially read the stocknum.dat file until the end of file. **For each record** perform a binary and sequential search to determine if the stock number exists in the arrays. Follow the flowcharts from your class notes for building the searches. Since the arrays are private members of the object, the searches must be placed into methods. The stock number read from the file must be sent to the method as an argument (received as a parameter), and an indicator (found, not found) returned (i.e., 0 = not found, 1 = found). If a stock number is not found, print the stock number, a message stating that it was not found, and the number of compares executed for each search.

Otherwise (i.e., stock number found), print the stock number, a message stating that it was found, the movie title and its price, and the number of compares executed for each search. Since the price is contained within the object (price array), a method must be used to retrieve it. Thus, the subscript must be sent to the method and the price returned.

At the end (i.e., after all records from stocknum.dat have been processed), summarize your report with the following: total number of compares for all searches, total number of records processed, and average number of searches.

**Note.** This is the last programming homework assignment.



## Tangibles

Submit the following items in a 9 x 12-inch manila envelope:

- Hardcopies of both the output (e.g., report.txt) and program (i.e., source listing).

**Note.** Please assign a txt extension to your output file. This makes it easier to open your file in Notepad.

- 3 1/2-inch diskette with your entire project (workspace) folder, including the program (ccp), data file (dat) and output file (txt).

## Sample Output

```

                                Video Search Report

Results                          Movie Title                               Searches
                                Bin      Seq
.
.
.
Video Found      1004  King and I, The                19.95   6     6
Video Not Found  2529
Video Not Found  206137
Video Found      1015  Bimbo Movie Bash              14.95   7     3
.
.
.
                                Total number of compares:      2200   544
                                Total records processed:      100    100
                                Average number of compares:   22.0   5.4

```

(Actual output)

