

Homework 4

100 Points

Arrays and Structures

Project: Best Colleges (see next pages)

Grading

		// Honors
1. main()	– 10	– 10
2. Get data from file	– 20	– 20
3. Display data manager (calls print array)	– 15	– 10
4. Print array	– 20	– 20
5. Search manager (call binary search)	– 15	– 10
6. Binary Search	– 20	– 10
7. Honors (sort and display)		– 20

Run the program once and save the output at the end of the source file as a comment.
Compress the source file, input and output files (if any), and upload the compressed file:
[22B_LastName_FirstName_H4.zip](#)

Honors Assignment

Sort the schools by rank without changing the original order, then display the schools (just the name) in a table: the first column should show the schools in ascending order by rank and the second column should show the schools in ascending order by year. Use either insertion sort or selection sort.

CIS 22B
Intermediate Programming Methodologies in C++
Programming Assignments

Project: Best Colleges

Write a program that provides information about two-year colleges in California. The data file, `CA_BestColleges.txt`, begins with `n`, the number of colleges in the file, followed by the rank, school name, year founded, email, graduation and transfer rate, first year retention rate, cost of attendance range, and approximate number of students (see data on the next page).

The data file contains the schools sorted in ascending order by year founded. Read the list of colleges into a dynamically allocated array of structures.

Display Data Manager:

Print any `k` consecutive schools requested by the user. For instance, if the user enters `0 2` you will display the first 2 schools using the format shown below:

```
Rank: 3
School Name: Santa Barbara City College
Year Founded: 1909
Email: https: http://www.sbccc.edu
Graduation and Transfer Rate: 53.8%
First Year Retention Rate: 84.3%
Cost of Attendance: $11882 - $18524
Number of Students: approx. 30687
```

```
Rank: 5
School Name: Pasadena City College
Year Founded: 1924
Email: http://www.pasadena.edu
Graduation and Transfer Rate: 50.2%
First Year Retention Rate: 92.1%
Cost of Attendance: $12708 - $17666
Number of Students: approx. 22000
```

If the user enters `0 5` display the first five schools, if the user enters `2 7` display 7 schools beginning with the one at index 2, and so on. Repeat this process until the user enters `0 0`.

Search Manager:

Since the list is sorted by year, you can search it using binary search. The search manager's task is to prompt the user to enter a year, call the binary search function to find the matching college, and either display a "not found" message or display the information about that school (use the same format as above). Repeat this process until the user enters `0`.

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Programming Assignments

Create a data file named **CA_BestColleges.txt** containing the following data:

```
15
3
Santa Barbara City College
1909
http://www.sbccc.edu
53.8 83.4 11882 18524 30687
5
Pasadena City College
1924
http://www.pasadena.edu
50.2 92.1 12708 17666 22000
14
West Hills College - Coalinga
1932
http://www.westhillscollge.com/coalinga
40.5 83.6 13349 21935 4000
7
Napa Valley College
1942
http://www.napavalley.edu
48.0 88.7 14120 18920 8996
2
Orange Coast College
1947
http://www.orangecoastcollege.edu
54.2 91.2 20244 26346 25000
15
Palo Verde College
1947
http://www.paloverde.edu
31.2 82.7 14266 18266 3898
4
Diablo Valley College
1949
http://www.dvc.edu
50.2 90.5 14839 20579 24781
6
Foothill College
1957
http://www.foothill.edu
68.8 87.5 12300 19302 18362
12
College of the Siskiyous
1957
```

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Intermediate Programming Methodologies in C++
Programming Assignments

<http://www.siskiyous.edu>

59.8 82.0 15306 21936 2473

10

Cuesta College

1963

<http://www.cuesta.edu>

50.7 86.2 12052 19135 9571

8

Ohlone College

1965

<http://www.ohlone.edu>

52.1 91.1 10898 15878 18000

1

De Anza College

1967

<https://www.deanza.edu>

72.7 90.7 12300 19302 24781

11

Feather River Community College District

1968

<http://www.frc.edu>

53.6 83.3 9012 14362 1635

13

Lake Tahoe Community College

1975

<http://www.ltcc.edu>

48.0 82.8 14199 19620 3000

9

Irvine Valley College

1985

<http://www.ivc.edu>

51.1 90.3 14415 20577 14384