**CPP Problem Design Example**

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| **Subject: Score recorder** |
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| **Main testing concept: structure/class**   |  |  | | --- | --- | | **Basics** | **Functions** | | ■ C++ BASICS  ■ FLOW OF CONTROL  ■ FUNCTION BASICS  □ PARAMETERS AND OVERLOADING  □ ARRAYS  □ STRUCTURES AND CLASSES  □ CONSTRUCTORS AND OTHER TOOLS  □ OPERATOR OVERLOADING, FRIENDS,AND REFERENCES  □ STRINGS  □ POINTERS AND DYNAMIC ARRAYS | □ SEPARATE COMPILATION AND NAMESPACES  □ STREAMS AND FILE I/O  □ RECURSION  □ INHERITANCE  □ POLYMORPHISM AND VIRTUAL FUNCTIONS  □ TEMPLATES  □ LINKED DATA STRUCTURES  □ EXCEPTION HANDLING  □ STANDARD TEMPLATE LIBRARY  □ PATTERNS AND UML | |
| **Description:**  Write a program that stores information about each student's name and grade, and do the following functions  1.The program can search the specific student's grades by input the student’s name.  2.The program can output the average grade depends on the inserted data  3.The program can output the list of student that has passed. (grade >= 60)  **Input:**  The program’s function should be call by the command line input, each command contains the key word and the parameters of that command needs. The key word and parameter should separate by space.  1.To inserting data, enter the command "Add" with a string and a non-negative integer to represent the student's name and grade.  2.To search the student’s grade, enter the command "Search" with the name of student.  3.To output the average number of score, enter command "Average".  4.To output the list of passed student enter the command "Pass".  The program should take multiple test input, Finish when read EOF.  **Output:**  1.There is no output when inserting data.  2.When output the average score, the result should be accurate to the second decimal place.  (unconditional rounding down, e.g. 46.667->46.66, 20.001->20)  3.When search the student, output the student's and score separated by space  4.When output the list of passed student, output each student's name and score separated by line, the list order is same as data insertion order.  5.Other output format please reference the sample input/output below.  **Sample Input / Output：**   |  |  | | --- | --- | | Sample Input | Sample Output | | Add mike 20  Add kate 40  Average  Add john 80  Average  Add pete 100  Pass  Search kate | 30  46.66  john 80  pete 100  kate 40 | |
| **□ Easy,Only basic programming syntax and structure are required.**  **■ Medium,Multiple programming grammars and structures are required.**  **□ Hard,Need to use multiple program structures or complex data types.** |
| **Expected solving time:**  25 minutes |
| **Other notes:**  The test data will not add the data with a name that already exists.  The test data will not search the data with a name that not exists.  You don't have to check any command error or repeated data insertion.  The program should take multiple test input, finish when read EOF. |