**CPP Problem Design**

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| **Subject:** **Fraction** |
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| **Main testing concept:** 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:**   * Please implement a class named **Fraction**. * Fraction has two private variables: **numerator** and **denominator**. * You are required to implement the following member functions: * **void set****Numerator(int numerator)**   Set the numerator of the fraction.   * **void setD****enominator(int** **denominator)**   Set the denominator of the fraction.   * **void getDouble()**   Print the value of the numerator divided by the denominator as a double value and rounded to six decimal places.  If the value can represent as an integer, please print it as an integer.   * **void outputReducedFraction()**   To print the irreducible fraction, you need to find the greatest common divisor of the numerator and denominator and then reduce the fraction.  **Input:**  The **main()** function in your submission will be replaced when judging.  You can use the **main()** function in “**Other notes**” to test your program.  This exercise does not have an input.  **Output:**  The result of executing your program with the given main function.  **Sample Input / Output：**   |  |  | | --- | --- | | Sample Input | Sample Output | | No inputs | 2  2  0.333333  1/3 | |
| **■ Eazy,Only basic programming syntax and structure are required.**  **□ Medium,Multiple programming grammars and structures are required.**  **□ Hard,Need to use multiple program structures or more complex data types.** |
| **Expected solving time:**  15 minutes |
| **Other notes:**  int main()  {  Fraction f1, f2;  f1.setNumerator(4);  f1.setDenominator(2);  f1.getDouble();  f1.outputReducedFraction();  f2.setNumerator(20);  f2.setDenominator(60);  f2.getDouble();  f2.outputReducedFraction();  return 0;  } |