**CPP Problem Design**

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| **Subject: Adding Large Numbers** |
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| **Main testing concept: String Processing**   |  |  | | --- | --- | | **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:**  Given two Integer A, B. Please calculate the adding result, noticed that the maximum bits of the number can be approximate 10000.  Don’t try to use long long, long long int, etc.(or\_m128), which will be absolutely invalid because the maximum bits of the given number will be approximate 10000((10^10000)-1).  Please make sure the input number is valid. If not, please print “**Not a valid number, please try again.**”  Please package the big number as structure (Ex: struct BigInt…) with a simple Object type for each bit.  Adding of big number please use the "function Add(...)", like below.  (const& won’t affect the grammar of parameter passing but can avoiding unnecessary memory usage. Use it or not depends on you.)  Struct BigInt  {  …  }  BigInt Add(const BigInt &lhs,const BigInt &rhs)  {  //Calculation  Return …;  }  int main()  {  BigInt a,b;  …Input a,b  BigInt result = Add(a,b);  …Output result  }  **Input:**  The first line of the program will enter N(100 > N > 0)，indicates that there’re N input data. Every input data is two big integers A, B with the maximum bits of A, B is（10^l0000) – 1.  **Output:**  Print A+B。  **Sample Input / Output：**   |  |  | | --- | --- | | Sample Input | Sample Output | | 3  43789507384925798320000000000000000000000000001  44997439848794037580000000000000000000000000002  1bbbba45  1234567  1  9 | 8878694723371983590000000000000000000000000003  Not a valid number, please try again.  10 | |
| **□ 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:**  25 minutes |
| **Other notes:** |