**10902 CPP Midterm Exam**

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| **Contributor: YU-CHENG JHONG** |
| **Subject : Count Area Size** |
| **Main testing concept：**   |  |  | | --- | --- | | **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：**  Count the total connected empty area of the given grid with respect to the given start point.  The grid contains 0(empty space) and 1(block).  The first image is the result of the first sample input.      **Input：**  Grid width and height.  Grid content, seperated by space’ ‘.  Start point position x and y, seperated by space‘ ’.  **Output：**  The area size.  **Sample Input / Output :**   |  |  | | --- | --- | | **Sample Input** | **Sample Output** | | 8 6  0 0 0 0 0 0 0 0  1 1 1 1 1 1 1 1  1 0 0 0 0 0 0 1  1 0 0 0 0 0 0 1  1 1 1 1 1 1 1 1  0 0 0 0 0 0 0 0  2 2 | 12 | | 8 8  0 0 1 0 0 0 0 0  1 1 0 1 1 1 1 1  1 0 0 0 0 0 0 1  1 0 0 0 0 0 0 1  1 0 0 0 0 0 0 1  0 1 0 0 0 0 0 1  0 0 1 0 0 0 0 1  0 0 0 1 1 1 1 0  1 3 | 28 | | 8 6  0 0 0 0 1 0 0 0  0 1 0 1 0 1 1 1  1 0 1 0 0 0 0 1  1 0 0 0 0 0 0 1  1 1 1 1 1 1 1 1  0 0 0 0 0 0 0 0  0 0 | 6 | |
| **□****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:**  20 minutes |
| **Other notes:** |