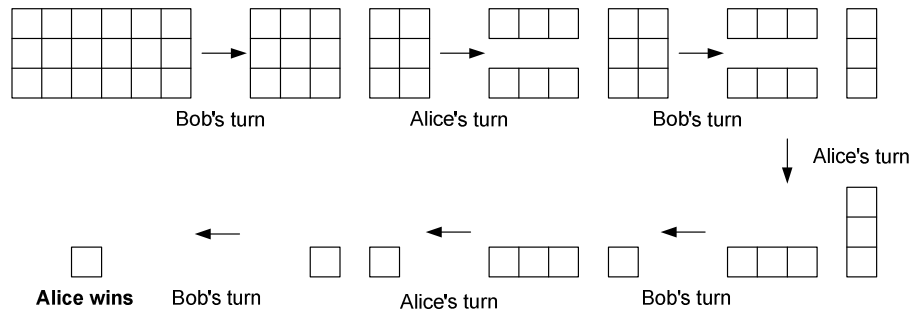


## C++ Programming Mini-Project A Cake-Cutting Game

By using Microsoft Visual Studio 2008, write a C++ object-oriented program to implement a cake-cutting game:

Alice and Bob are the two players of the game. They are presented with a rectangular cake consisting of  $m \times n$  pieces. At Bob's turn, he will take away (and eat) a contiguous number of pieces vertically. At Alice's turn, she will take away (and perhaps eat) a contiguous number of pieces horizontally. Whoever gets the last piece(s) of the cake will be declared as the winner.

For example, Alice and Bob are presented a  $3 \times 6$  cake.



1. Your program needs to be designed with a graphical user interface (GUI). There are two playing modes: human and computer.
2. While you are responsible for the final design of the program, it is required that the code governing the rules of the game should be implemented with a separate static library and included into the managed C++ codes. The managed C++ code you write should only be responsible for the GUI.
3. Should you want to get a credit, you should design the game with some advanced features. For example, you can let the program initialize the game randomly, record the results of each step in a file, and so on.
4. Should you want to get a distinction, the computer, for example, will always (or for most of the time) be the winner.

### A. Project deliverables

You will be required to hand in a report with a CD-ROM. Your report must include:

1. Abstract: An abstract of less than 200 words that summarizes the achievements of your project.
2. Introduction: A detailed description of the objective and requirements of the project, and a brief description of the methodology.
3. Methodology: The methodology includes
  - The structure of the program developed, including
    - The specifications of the classes created, e.g. the public/private member functions/variables contained — explain as far as possible why you make such choices.
    - The flow of execution (it is good to include a flow chart to show it.)
  - The algorithms involved in designing the computer player.
4. Results
  - Include the execution results of your program captured from the screen.
5. Conclusion and future development
  - Summarize the experience gained from the mini-project.
  - Indicate how your program can be extended and improved if more time is allowed.

The CD-ROM must include the following items:

1. A soft copy of the report,
2. All files that are required to build the project and run the program,
3. The executable file(s) of the program (.exe file(s)), and
4. A readme file that describes how to build the project and other details about the project (readme.txt).

**B. Penalty for plagiarism**

Plagiarism of any degree will not be tolerated. Offenders (both the copy cat and the one who volunteers the copied materials) will lose the entire project marks plus a further 50% deduction. That is, if the project comprises 30% of the overall mark, the offender will lose 45% of the overall mark.