Homework#4 (Due : June 14th)

- Deadline : June 14th, 11:59pm
- Where to submit : eClass (http://eclass.cau.ac.kr)
- How to submit :
    - Create a folder. The name of the folder should be "studentID#.hw4". (ex) 20111499.hw4
    - We have three problems in hw4. Make four C source files. The name of the source files should be the format "studentID#.hw4.#.c"
        - ex) 20111499.hw4.1.c , 20111499.hw4.2.c , 20111499.hw4.3.c

    - In each source file .c, your code must have comments that include your name and student_id#
    - put the three source files into the folder we created.
    - Compress the folder into a zip file using WinZip (Don't use ALzip). The name of the zip file should be "student#.hw4.zip". (ex) 20111499.hw4.zip
    - Upload the zip file into eClass website.
    - If you don't follow above instructions, you may get penalty in your score.
    - **You must do programming yourself.**

Prob1.[Airline Ticket] A small airline has just purchased a computer for its new automated reservations system. You have been asked to program the new system. You are to write a program to assign seats on each flight of the airline's only plane. (capacity : N seats)

Your program should first ask the capacity and get N as an input. Your program should display the following menu of alternatives - Please type 1 for "First Class" and Please type 2 for "Economy Class". If the person types 1, your program should randomly assign a seat in the first class section (seats# 1 ~ seats# N/2). If the person types 2, your program should randomly assign a seat in the economy section (seats# N/2+1 ~ seats# N). Your program should print a boarding pass indicating the person's seat number and whether it is in the first class or economy section of the plane.

Use a one-dimensional array with dynamic allocation to represent the seating chart of the plane. Initialize all the elements of the array to 0 to indicate that all seats are empty. As each seat is assigned, set the corresponding elements of the array to 1 to indicate that the seat is no longer available.

Your program should, of course, never assign a seat that has already been assigned. When the first class section is full, your program should ask the person if it is acceptable to be placed in the economy section (and vice versa). If "yes", then make the appropriate seat assignment. If "no", then print the message "Next flight leaves in 3 hours".

(example)
> prob4.exe
get N ? 4
Please type 1 for "First Class" and Please type 2 for "Economy Class" ? 2
Boarding Pass : seat# - 4 (Economy Class)
Please type 1 for "First Class" and Please type 2 for "Economy Class" ? 2
Boarding Pass : seat# - 3 (Economy Class)
Please type 1 for "First Class" and Please type 2 for "Economy Class" ? 1
Boarding Pass : seat# - 1 (First Class)
Please type 1 for "First Class" and Please type 2 for "Economy Class" ? 2
"Economy Class" seats are full. Is "First Class" seat OK? yes
Boarding Pass : seat# - 2 (First Class)

Prob2. [Bilinear Interpolation] Consider that we have 5x5 grids where a float value defined on each grid point is taken from keyboard input.
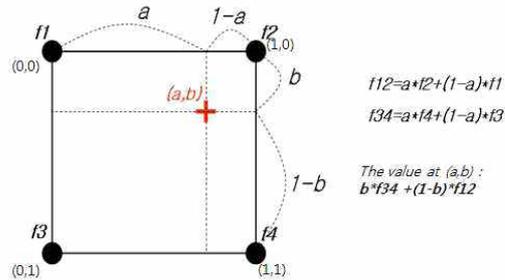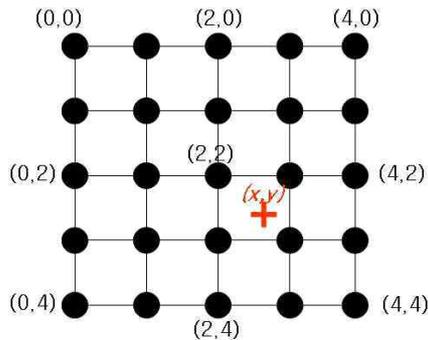
Write a program that computes the value at an arbitrary point (x,y) inside the grid. The value at (x,y) should be computed using bilinear interpolation. The coordinate value x and y should be also taken from a keyboard input. Bilinear interpolation can be done as follows :

Bilinear Interpolation : The value at an arbitrary point (a,b) inside a rectangle can be computed using the values at the four corner points of the rectangle f1, f2, f3, f4 as shown in above figure (right).

[Input]
a. keyboard input as described below
b. first line : two float values x and y
c. second line : 25 float values for the values at 25 grid points.
   The order of input is like (0,0),(1,0),(2,0),(3,0),(4,0),(0,1),(1,1),....,(3,4),(4,4)
d. after pressing enter at the second line, the output result will be printed

[Output]
a. the result will be printed on screen (standard output)
b. The value at the coordinate (x,y) that is computed using bilinear interpolation.
Print only 3 digits below decimal point for output. (소수점아래는 3자리수만 출력!)

Input Example

```
0.5 1.0
1.0 3.5 2.0 3.0 4.1 5.0 1.5 3.2 4.8 0.0 1.2 1.5 4.3 0.0 0.0 4.0 1.0 2.1 3.4 5.0 1.0 2.0 3.0 1.0 4.0
```

Output Example

```
3.250
```