Department of CSE, BUET
CSE102, Section C2
Online 1
Duration 30 minutes, Full Marks 30

1. You have to find out the number of square tiles (size: *a* * *a*) needed to **fully cover** a floor of a rectangular room (size: *n* * *m*).

[Marks: 12]

   - Number of square tiles must be an integer (cannot be a fraction)
   - Total surface area of the square tiles must be equal to the surface area of the floor
   - If it's not possible to cover the floor in the desired way, print cannot cover"

Sample I/O:

Input	Output
a = 2 n =4 m = 6	6
a = 2 n = 3 m = 3	cannot cover

2. A tiger was running to chase a deer at a constant speed **v** ms^-1. When the tiger was just **d1** m behind from the deer's position, the deer spotted the tiger. Just after spotting the tiger, the deer started running at acceleration **a** ms^-2 from stationary state. However, the moment the deer starts escaping from the tiger, the deer is exactly **d2** m behind from a ***safe zone***. In the safe zone, the deer is completely safe from the tiger.

[Marks: 18]

   - Assume that the tiger keeps its speed constant throughout the chase.
   - Assume that the tiger, the deer, and the safe zone are in the same line. Where, the deer's position is somewhere between the tiger and the safe zone

Your task is to find out whether the tiger can catch the deer, or the deer becomes safe. Print out "caught" or "safe" depending on the case.

Sample I/O:

Input	Output
d1 = 5 a = 0.5 v = 2 d2 = 35	caught
d1 = 3 a = 1 v = 0.5 d2 = 2	safe

Hints/ Equations (You can use any different technique to solve the problems):

- Distance covered in time **t** with acceleration of **a** and initial velocity **u:** $s = ut + 0.5t^2$
- Distance covered in time **t** with velocity **v:** $s = vt$
- Solution of quadratic equation, $ax^2 + bx + c = 0 : x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$
- You can use the ***sqrt*** function

You can use typecasting, if...else if...else, switch-case, ternary operator to solve the above tasks. You cannot use loop/ array.

Submission Instructions:

1. Create a folder with your student id (2105xxx).

2. Create separate files for each task and rename them as problem_1.c, problem_2.c, etc.

3. Put only the .c files created in step 2 in the folder created in step 1.

4. Zip the folder (2105xxx.zip) and upload it on Moodle.