

Name \_\_\_\_\_ ( )

Class \_\_\_\_\_

Date \_\_\_\_\_

### Knowledge Management

Opened Date: 2 Apr 2022

Reg ID :

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### Type: Implementations

### Topic:

Code Jam 2023 - Qualification Round

Question 1 - Punch Card

### Discipline of Learning:

- Computer Science
  - Programming ( 1 )
    - String Operation
      - Substring

### Content (Modifiers)

- This kind of "knowledge registration" will merge into the sub-directory.

#### Code Jam Qualification Round Question A

In this question, the participants should print out several specific-sized "punch card" in test cases. The "punch card" is an ASCII art that makes up with characters, '.', '|', '+' and '-'.  
The user should put 2 numbers in each test case, firstly rows then columns.

The solution is tricky, but a simple question of using basic String method knowledge — Sub-String.

Firstly, hard-coding the header and the second rows from the top is wise if the size is constrained within a number, such as a test set 1 for the row and column not exceeding 10.

Then also hard-code the 2 different rows of "String" with the same method as the header.

The hardcoding table is as follows

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#### Hardcoding Pattern

Header

2nd row from top

Pattern 1

Pattern 2

#### String content

```
. . + - + - + - + - + - + -  
. . | . | . | . | . | . | .  
+ - + - + - + - + - + - + -  
| . | . | . | . | . | . | .
```

In the core loop, there is an indicator and a total generated engine that is calculated as  $row * 2 + 1$ . That tells the loop on an iterative basis printing out alternative pattern 1 and pattern 2.

Looping:

When the indicator (i) is 0, that will print out the header section within character between 0 to the double of the column, then add a '+' symbol at the rear.

When (i) is 1, things run the same as the passed loop but print out the 2nd row from the top pattern, and add '|' behinds.

When (i) is an even number, print out the pattern the same as the passing loop but in pattern 1 with a '+'; pattern 2 with a '|', and vice versa.

Finally, print pattern 1 as <sup>last</sup> ~~first~~ line.



# Programming Basic 101

## Question (A) - EASY 10

Sample Conditional

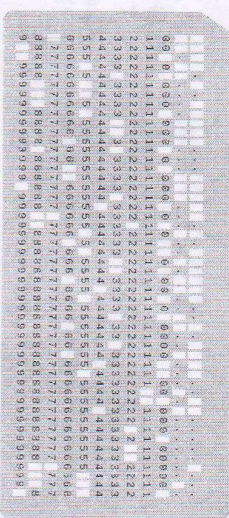
Qualification Round 2022 - Code Jam 2022

Punched Cards

Score: 11 / 11

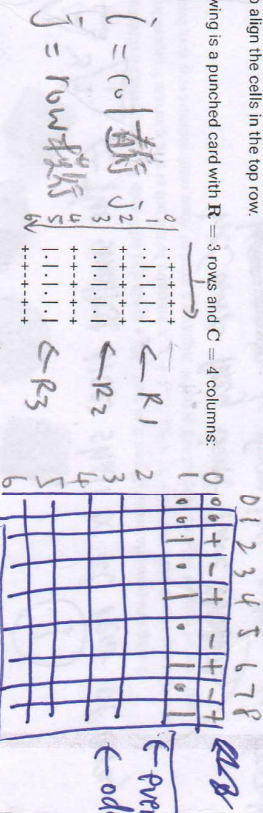
Problem

A secret team of programmers is plotting to disrupt the programming language landscape and bring punched cards back by introducing a new language called *Punched Card Python* that lets people code in Python using punched cards! Like good disrupters, they are going to launch a viral campaign to promote their new language before even having the design for a prototype. For the campaign, they want to draw punched cards of different sizes in ASCII art.



The ASCII art of a punched card they want to draw is similar to an  $R \times C$  matrix without the top-left cell. That means, it has  $(R \cdot C) - 1$  cells in total. Each cell is drawn in ASCII art as a period (.) surrounded by dashes (-) above and below, pipes (|) to the left and right, and plus signs (+) for each corner. Adjacent cells share the common characters in the border. Periods (.) are used to align the cells in the top row.

For example, the following is a punched card with  $R = 3$  rows and  $C = 4$  columns:



There are more examples with other sizes in the samples below. Given the integers  $R$  and  $C$  describing the size of a punched card, print the ASCII art drawing of it as described above.

Input

The first line of the input gives the number of test cases,  $T$ .  $T$  lines follow, each describing a different test case with two integers  $R$  and  $C$ : the number of rows and columns of the punched card that must be drawn.

Output

For each test case, output one line containing Case # $x$ : where  $x$  is the test case number (starting from 1). Then, output  $(2 \cdot R) + 1$  additional lines with the ASCII art drawing of a punched card with  $R$  rows and  $C$  columns.

Limits

Time limit: 5 seconds.  
Memory limit: 1 GB.

Test Set 1 (Visible Verdict)

- $1 \leq T \leq 81$ .
- $2 \leq R \leq 10$ .
- $2 \leq C \leq 10$ .

Sample

Sample Input

3  
3 4  
2 2  
2 3

Sample Output

Case #1:  
+---+  
|. |.|.  
|. |.|.  
|. |.|.  
+---+  
Case #2:  
+---+  
|. |.|.  
|. |.|.  
|. |.|.  
+---+  
Case #3:  
+---+  
|. |.|.  
|. |.|.  
|. |.|.  
+---+  
total 2 Col  
total 3 Col

Sample Case #1 is the one described in the problem statement. Sample Cases #2 and #3 are additional examples. Notice that the output for each case contains exactly  $R \cdot C + 3$  periods.

Solution:

Sub-string

