

# 12559 Finding Black Circles

There are some black circles completely drawn on a white paper. Given the digital image of the paper, could you find the circles?

The width and height of the digital image are  $w$  and  $h$  pixels. Each pixel is a  $1 \times 1$  square. The center of the top-left pixel is  $(0, 0)$  and the center of the bottom-right pixel is  $(w - 1, h - 1)$ . For each circle, the center coordinates and the radius are all integers. If a circle passes through a pixel (merely touching its border is not considered passing), the pixel is rendered black (1), otherwise it is white (0). Due to noises, at most 2% black pixels might become white. No white pixels will become black.

### Input

The first line contains the number of test cases  $T$  ( $T \leq 20$ ). Each test case begins with two integers  $w$  and  $h$  ( $30 \leq w, h \leq 100$ ). The following  $h$  lines contain the digital image. There will be at least one and at most five circles. The radius of each circle will be at least 5. The judge input will be carefully chosen to avoid ambiguities and confusions.

### Output

For each test case, print the number of circles  $k$ , and  $k$  tuples  $(r, x, y)$ , each describing a circle centered at  $(x, y)$  with radius  $r$ . Tuples should be sorted lexicographically (first  $r$ , then  $x$ , and then  $y$ ).

### Sample Input

```
1
30 30
00000000000000000000000000000000
00000000000001111111000000000000
00000000000011000001100000000000
00000000000110000000110000000000
00000000001100000000011000000000
00000000011000000000001100000000
00000001111111000000000100000000
00000111010001110000000100000000
00001100010000011000000000000000
00011000010000001100000100000000
00110000010000000110000100000000
00100000011000000010001100000000
01100000001100000011011000000000
01000000000110000001110000000000
01000000000011000001100000000000
01000000000001111111000000000000
01000000000000000000010000000000
01000000000000000000010000000000
011000000000000000000110000000000
001000000000000000000100000000000
0010000000000000000001100000000000
000110000000000001100000000000000
```

```
000011000000000110000000000000
000001110000011100000000000000
000000011111110000000000000000
000000000000000000000000000000
000000000000000000000000000000
000000000000000000000000000000
000000000000000000000000000000
000000000000000000000000000000
000000000000000000000000000000
```

**Sample Output**

Case 1: 2 (7,16,8) (9,10,15)