

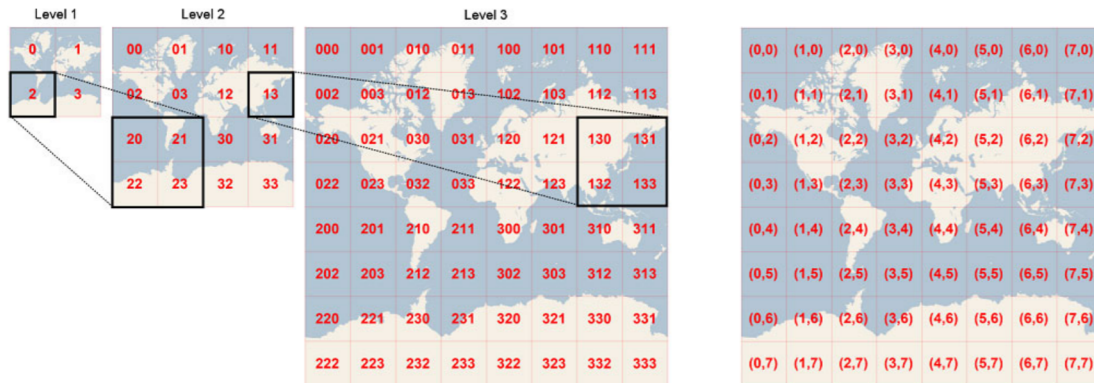
# Problem I

## Identifying Map Tiles

Time limit: 1 second

Map websites such as Bing Maps and Google Maps often store their maps as many different image files, called tiles. The lowest zoom level (level 0) consists of a single tile with a low-detail image of the whole map, zoom level 1 consists of four tiles each containing a slightly more detailed version of a quarter of the map, and in general zoom level  $n$  contains  $4^n$  different tiles that each contain a part of the map.

One way of identifying a tile is by means of a *quadkey*. A quadkey is a string of digits uniquely identifying a tile at a certain zoom level. The first digit specifies in which of the four quadrants of the whole map the tile lies: 0 for the top-left quadrant, 1 for the top-right quadrant, 2 for the bottom-left quadrant and 3 for the bottom-right quadrant. The subsequent digits specify in which sub quadrant of the current quadrant the tile is. The quadkeys for zoom levels 1 to 3 are shown in Figure I.1(a).



(a) Quadkeys for zoom levels 1 to 3

(b) Coordinates for zoom level 3

Figure I.1: Visualisation of the two representations. The images are taken from the [MSDN](#).

Another way of identifying a tile is to give the zoom level and  $x$  and  $y$  coordinates, where  $(0, 0)$  is the left-top corner. The coordinates for the tiles of zoom level 3 are shown in Figure I.1(b). Given the quadkey of a tile, output the zoom level and  $x$  and  $y$  coordinates of that tile.

## Input

The input consists of:

- one line with a string  $s$  ( $1 \leq \text{length}(s) \leq 30$ ), the quadkey of the map tile.

The string  $s$  consists of only the digits '0', '1', '2' and '3'.

## Output

Output three integers, the zoom level and the  $x$  and  $y$  coordinates of the tile.

**Sample Input 1**

3

**Sample Output 1**

1 1 1

**Sample Input 2**

130

**Sample Output 2**

3 6 2