# Level 3

# > Level 3

## Centers and distances

In order to plan a deployment and extraction route we need to know where we need to land. Our helicopter will land in the middle of the roof and then move on to another building. Calculate the distances that we'll have to travel.

Task for Level 3:

**Calculate the center of the roof for all buildings and print out some distances between some given buildings**

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- Buildings are defined as in Level 2
- The **center of the roof** of a building is defined as the **center of mass** of the roof plane.
- **Do not round** the center coordinates when calculating the distance
- The **distance** between two buildings is defined as the **rounded up euclidean distance** between the **roof centers**

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**Input format:** Same as previous, followed by building pair specification

<number_of_rows> <number_of_columns>
<height> <height> ...
<height> <height> ....

...

<number_of_pairs>

<building_id_from0> <building_id_to0>

<building_id_from1> <building_id_to1>

<building_id_from2> <building_id_to2>

...

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**Output format:**

<distance0>

<distance1>

...

For each pair in the input, output the **distance** on a **new line** in the **same order**

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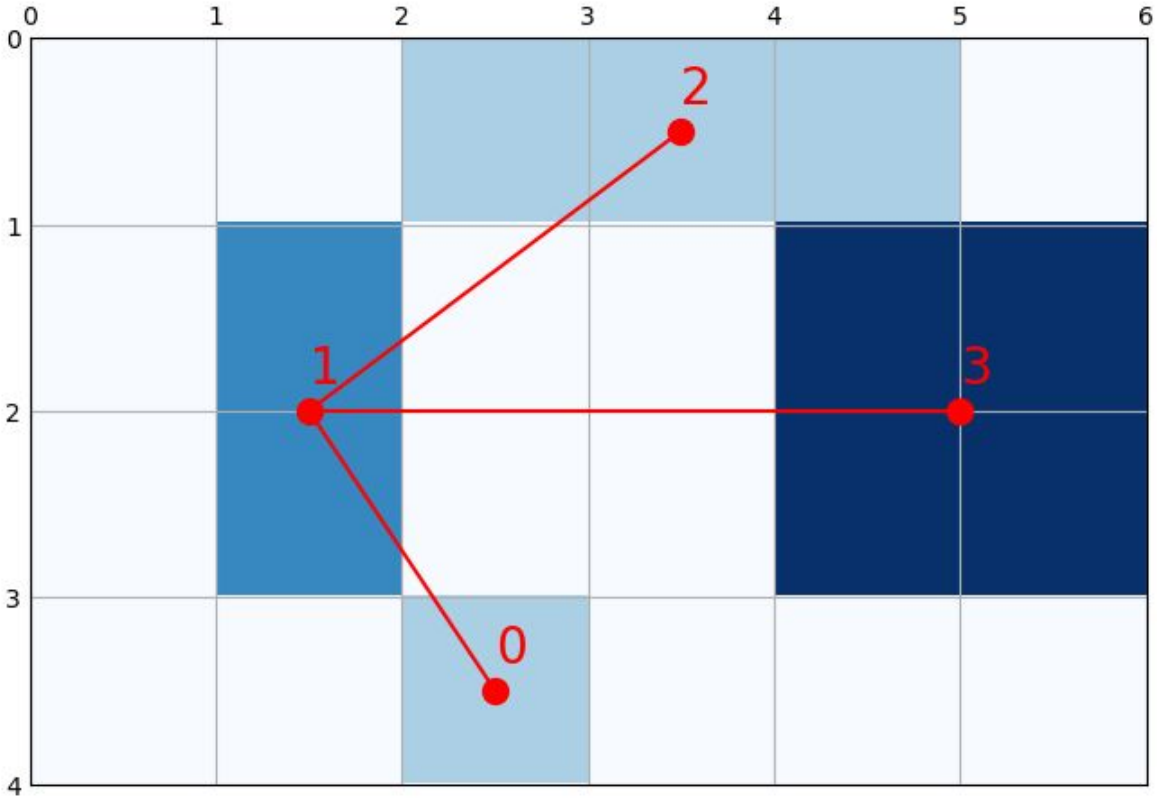
## Example input:

```
4 6
0 0 1 1 1 0
0 2 0 0 3 3
0 2 0 0 3 3
0 0 1 0 0 0
3
0 1
1 2
1 3
```

## Example output:

```
3
3
4
```



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## Details

The center of building 0 is at (3.5, 2.5, 1)*
The center of building 1 is at (2, 1.5, 2)

The distance between 0 and 1 is 2.06
which is then rounded up to 3

* center format is (row, column, height)