

Platform Engineer Backend

In architecture terminology, we have, among others, the following two terms:

- *Building limits*: The areas (polygons) on your site where you are allowed to build
- *Height plateaus*: Areas (polygons) on your site with different elevation. In reality, your building site is a continuous irregular terrain, but before building, you level your terrain into discrete plateaus with constant elevation.

We run a preprocessing step that splits the building limit into polygons corresponding to the height plateaus. These building limit polygons should have the elevation of the corresponding height plateau set as a property.

Your task is to implement an API with a clean interface that consumes building limits and height plateaus, splits up the building limits according to the height plateaus, and stores these three entities (building limits, height plateaus and split building limits) in a persistent way.

VALIDATION

Although the height plateaus should completely cover the building limits, inaccuracies in the input may occur. Consider how you can validate the input/output and handle any inaccuracies such as gaps/holes between height plateaus, etc.

ERROR HANDLING

The API should give meaningful error messages when errors occur

CONCURRENCY

Imagine that two users, Bob and Mary, make modifications to the same project. Bob do some modifications to the building limits while Mary changes the height plateaus. What happens if they call the API at the same time? Make sure the API deals with concurrent updates.

TESTING

Think about ways of testing your application to make sure it works as intended.

You are free to choose any language and libraries to solve the task.

Example input

The format of the input is a JSON document on the following format:

```
{
  "building_limits": <GeoJSON>,
  "height_plateaus": <GeoJSON>,
}
```

A complete example is as follows (see visualization below)

```
"building_limits": {
  "type": "FeatureCollection",
  "features": [
    {
      "geometry": {
        "coordinates": [
          [
            [10.71696696494792, 59.944454785331715],
```

```

        [10.7205481014655, 59.94392858334589],
        [10.718443133916844, 59.94272144353057],
        [10.716189904983372, 59.943157938769176],
        [10.71696696494792, 59.944454785331715]
    ]
},
    "type": "Polygon"
},
    "properties": {},
    "type": "Feature"
}
]
},
"height_plateaus": {
    "type": "FeatureCollection",
    "features": [
        {
            "geometry": {
                "coordinates": [
                    [
                        [10.718000857724448, 59.94270014737037],
                        [10.720210838893628, 59.94254805032234],
                        [10.72084663643725, 59.94435242876732],
                        [10.718190879593736, 59.944463373453736],
                        [10.718000857724448, 59.94270014737037]
                    ]
                ]
            },
            "type": "Polygon"
        },
        {
            "properties": { "elevation": 100 },
            "type": "Feature"
        }
    ],
    {
        "geometry": {
            "coordinates": [
                [

```

```
[10.718190879593736, 59.944463373453736],
[10.716741889934546, 59.94453702965385],
[10.716375465013183, 59.94379945247919],
[10.718089177076028, 59.94351966874942],
[10.718190879593736, 59.944463373453736]
]
],
"type": "Polygon"
},
"properties": { "elevation": 50 },
"type": "Feature"
},
{
  "geometry": {
    "coordinates": [
      [
        [10.718089177076031, 59.94351966874942],
        [10.718000857724448, 59.94270014737037],
        [10.715884575184191, 59.94305261312847],
        [10.716375465013183, 59.94379945247919],
        [10.716375465013183, 59.94379945247919],
        [10.718089177076031, 59.94351966874942]
      ]
    ],
    "type": "Polygon"
  },
  "properties": { "elevation": 70 },
  "type": "Feature"
}
]
```

}

}

Visualization of example input

Building limits



Height plateaus



Building limits and height plateaus

