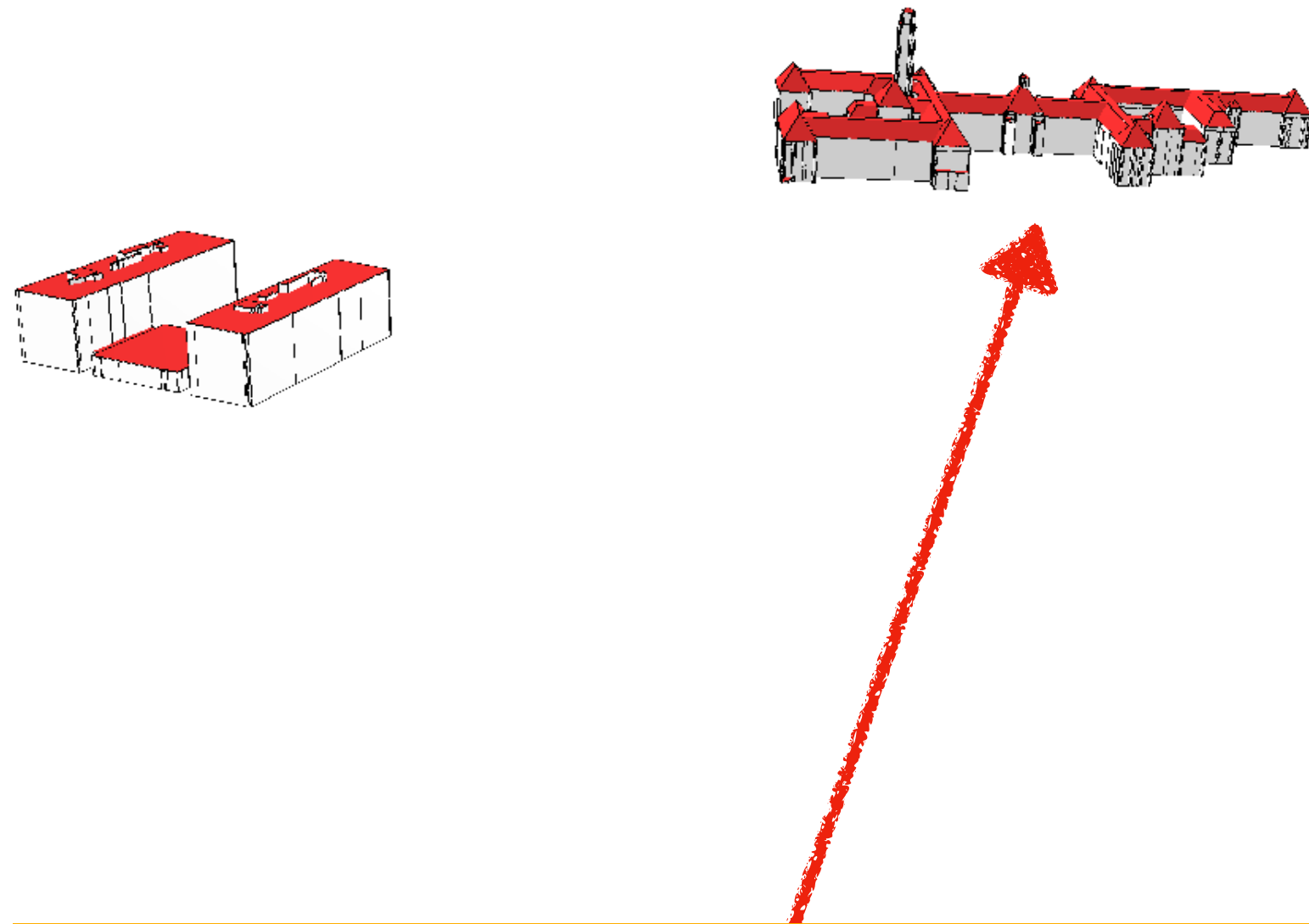# Feedback hw02
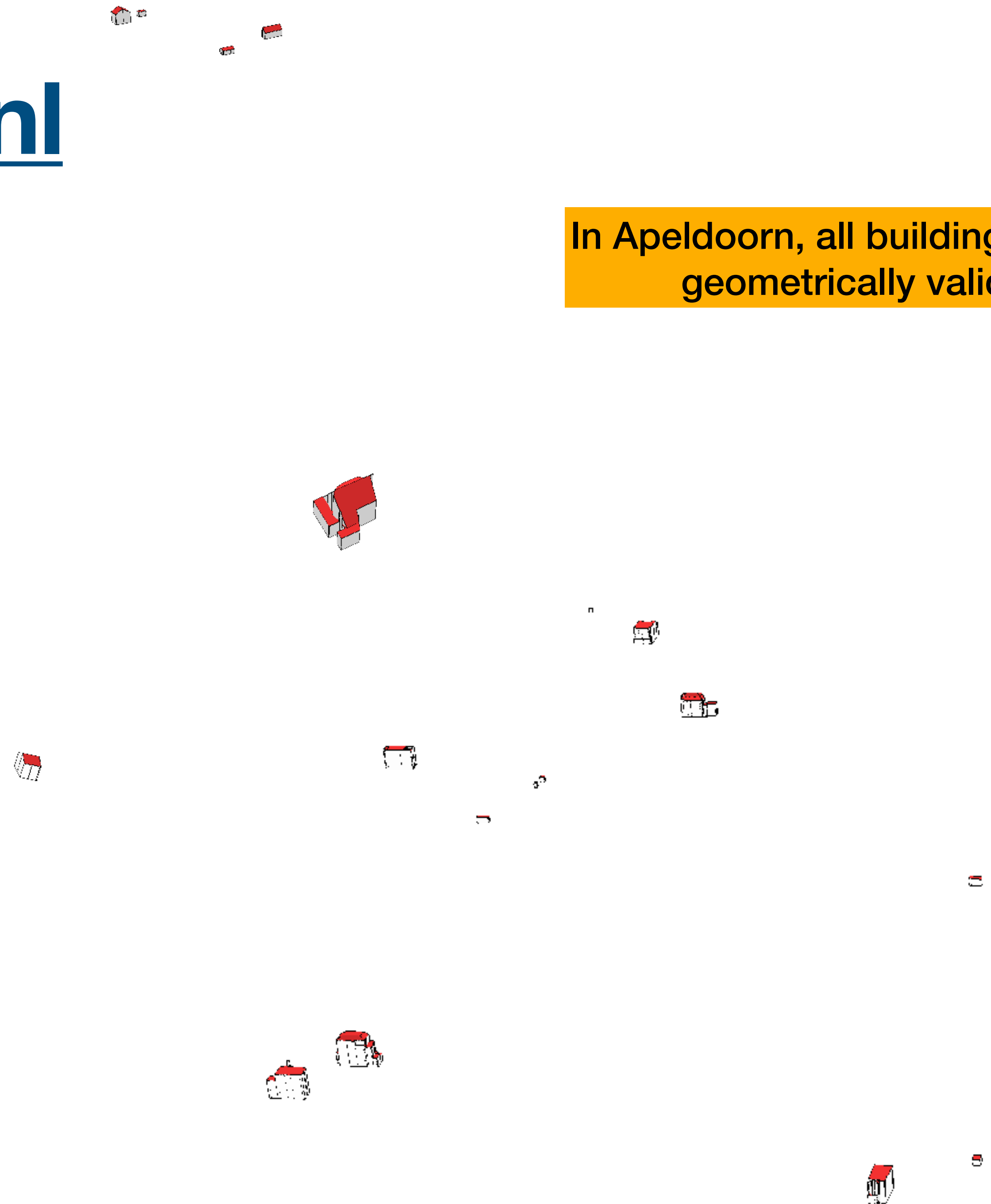
Hugo Ledoux (2023-03-26)

3 sub-tiles of 3dbag.nl
Delft + Apeldoorn

In Apeldoorn, all buildings were geometrically valid

I finally ignored this invalid building, results are not reliable and I could see this (depending on how you triangulated)

Semi-automatic marking

```python
14
15  re = {}
16  with open('re.csv', mode='r') as csv_file:
17      csv_reader = csv.DictReader(csv_file, delimiter=' ')
18      for row in csv_reader:
19          bid = row['id'][:-2]
20          re[bid] = row
21
22  def main():
23
24      metrics = ['volume', 'rectangularity', 'hemisphericality', 'roughness']
25      for coid in j["CityObjects"]:
26          if coid in re:
27              print("===", coid)
28              co = j["CityObjects"][coid]
29              for metric in metrics:
30                  if metric not in co["attributes"]:
31                      print(metric, ": missing attribute")
32                  else:
33                      if metric == "volume":
34                          if math.isclose(float(re[coid][metric]), co["attributes"][metric], abs_tol=2.0) == False:
35                              print(metric, ":", co["attributes"][metric], "(", re[coid][metric], ")")
36                      else:
37                          if math.isclose(float(re[coid][metric]), co["attributes"][metric], abs_tol=0.01) == False:
38                              print(metric, ":", co["attributes"][metric], "(", re[coid][metric], ")")
39
40  if __name__ == '__main__':
41      main()
42
```
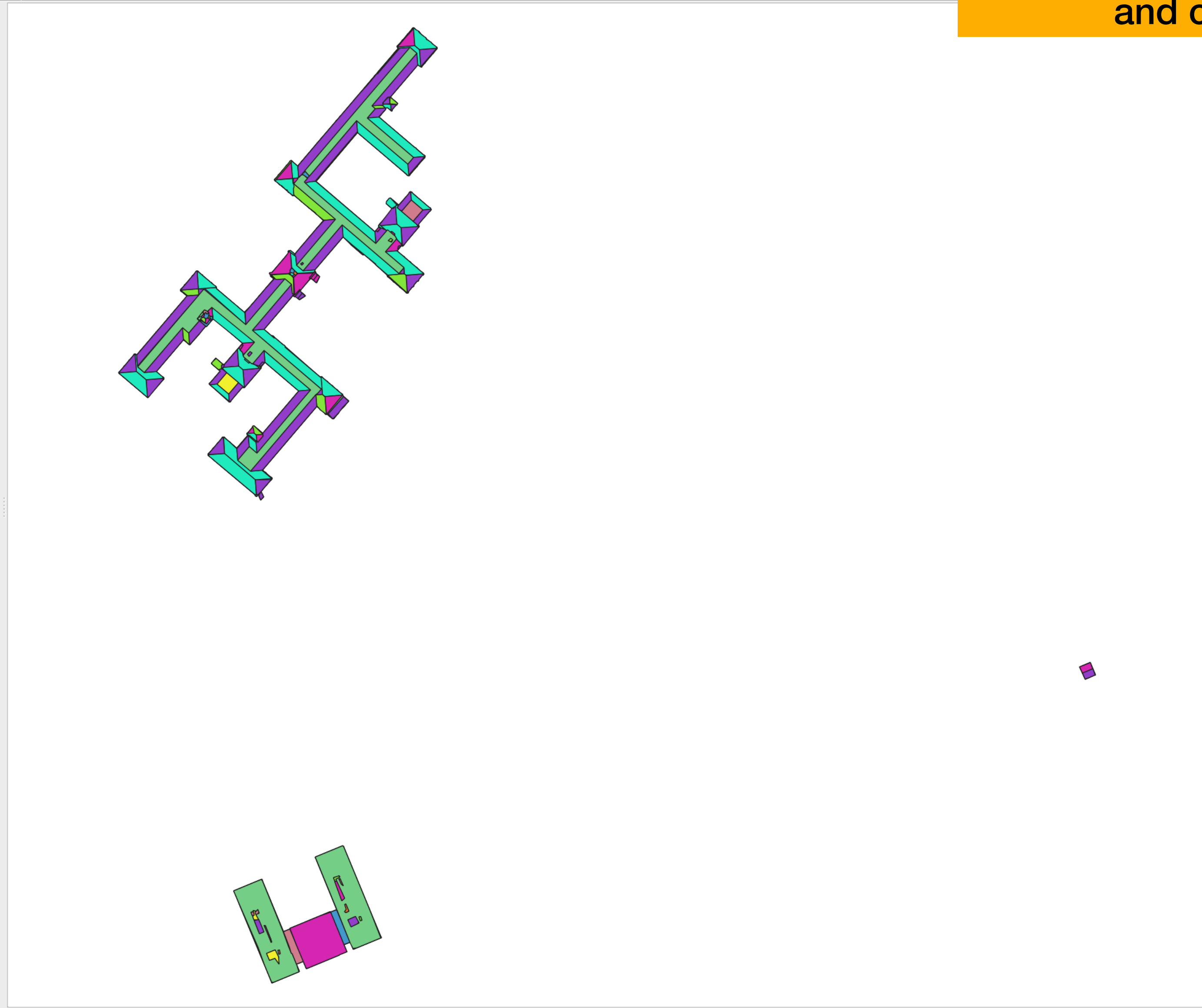
I used a tolerance for the values
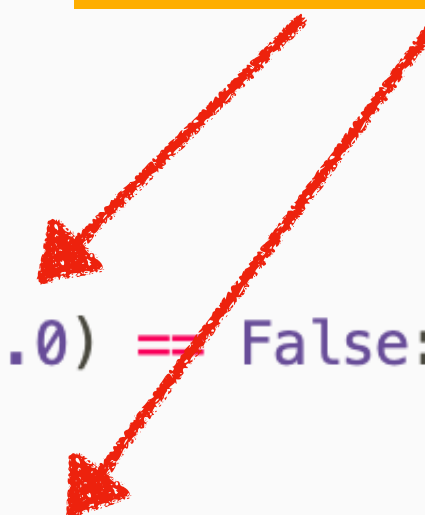
For orientation, I loaded into QGIS with the semantic surfaces and applied a colour map and checked those in Delft
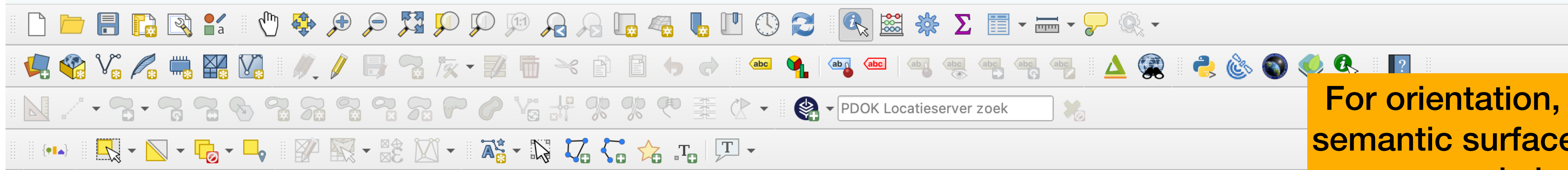
What is wrong here?

|	
h_dak_min	5.51200008392334
h_maaiveld	-0.4099999964237213
hemispherica...	0.5414044918130896
identificatie	"NL.IMBAG.Pand.05031000000020896"
kas_warenhuis	false
lod11_replace	false
ondergronds_...	"above ground"
oorspronkeli...	1952
pw_actueel	"yes"
pw_bron	"ahn3"
reconstructi...	"tudelft3d-geoflow"
reconstructi...	false
rectangularity	0.8434100978712038
rmse_lod12	0.6830542683601379
rmse_lod13	0.6854665279388428
rmse_lod22	0.027413655072450638
rn	1
roughness index	1.1868789194615257
status	"Pand in gebruik"
t_run	89.70899963378906
val3dity_cod...	"[]"
val3dity_cod...	"[]"
val3dity_cod...	"[]"
volume	282.76727328119523
voorkomenide...	1
	"NL.IMBAG.Pand.050310000002089
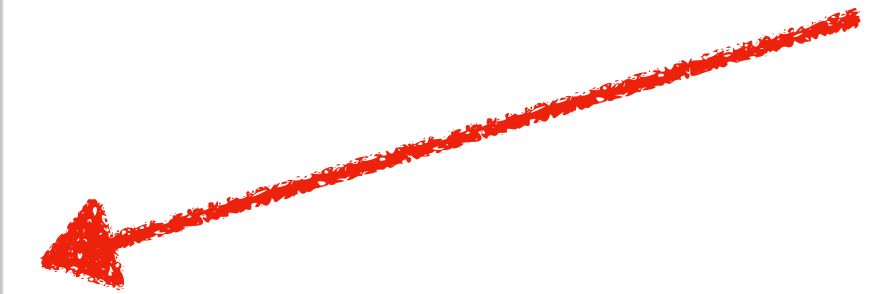
What is wrong here?

```cpp
void writetoCityJSONfile(json &j, std::vector<Point3> &lspts) {
    for (auto &CityObject: j["CityObjects"].items()) {
        if (CityObject.value()["type"] == "Building") {
            CityObject.value()["attributes"]["volume"] = std::to_string(buildings[CityObject.key()].volume);
            CityObject.value()["attributes"]["rectangularity"] = std::to_string(buildings[CityObject.key()].rectangularity);
            CityObject.value()["attributes"]["area"] = std::to_string(buildings[CityObject.key()].area);
            CityObject.value()["attributes"]["hemisphericality"] = std::to_string(buildings[CityObject.key()].hemisphericality);
            CityObject.value()["attributes"]["roughness"] = std::to_string(buildings[CityObject.key()].roughnessindex);

            std::map<int, roofSurface>::iterator it;
            for (auto &id_children: CityObject.value()["children"]) {
                for (auto &boundaries: j["CityObjects"][id_children.get<std::string>()]["geometry"]) {
                    for (int value = 0; value < boundaries["semantics"]["values"].size(); value++) {
```

```
 5        "NL.IMBAG.Pand.0503100000032914": {
 6           "attributes": {
 7              "dak_type": "slanted",
 8              "volume": 1234.56,
 9              "rectangularity": 123.23,
10              "hemisphericality": 345.2,
11              "roughness": 17.0,
12              "data_area": 7407.98779296875,
13              "data_coverage": 0.941340446472168,
14              "documentnummer": "318043.tif",
15              "geconstateerd": false,
16              "gid": 17147742,
17              "h_dak_50p": 19.93000030517578,
```
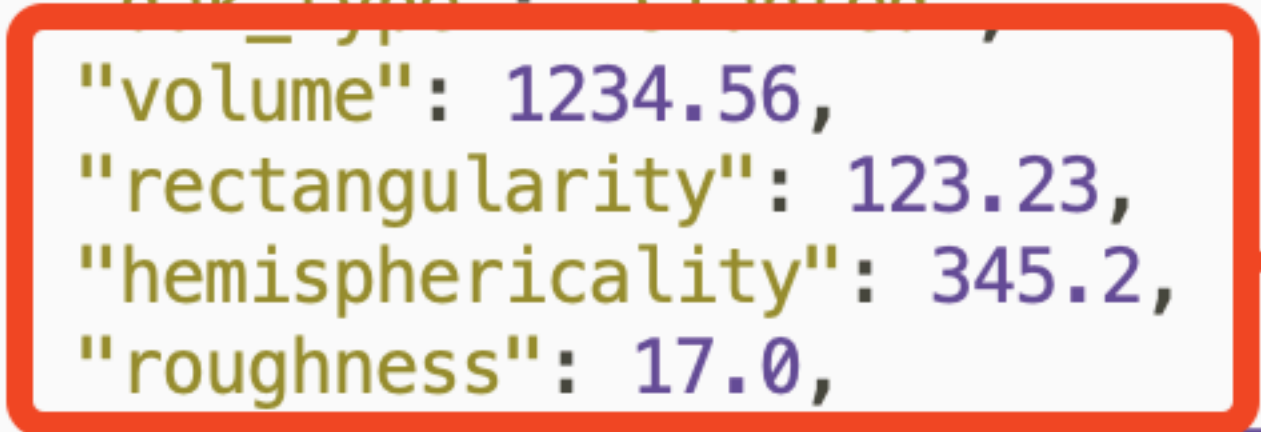
What is the centroid of a polyhedron?

- You could decide, I was flexible with the roughness results ([0, 2] was the range, more or less)

- Option 1: Mean of x-y-z of all the vertices

- Option 2: Take the samples and find the mean

- Option 3: use centroid of triangles and their area as weight and use CGAL

Results are good, you impressed me
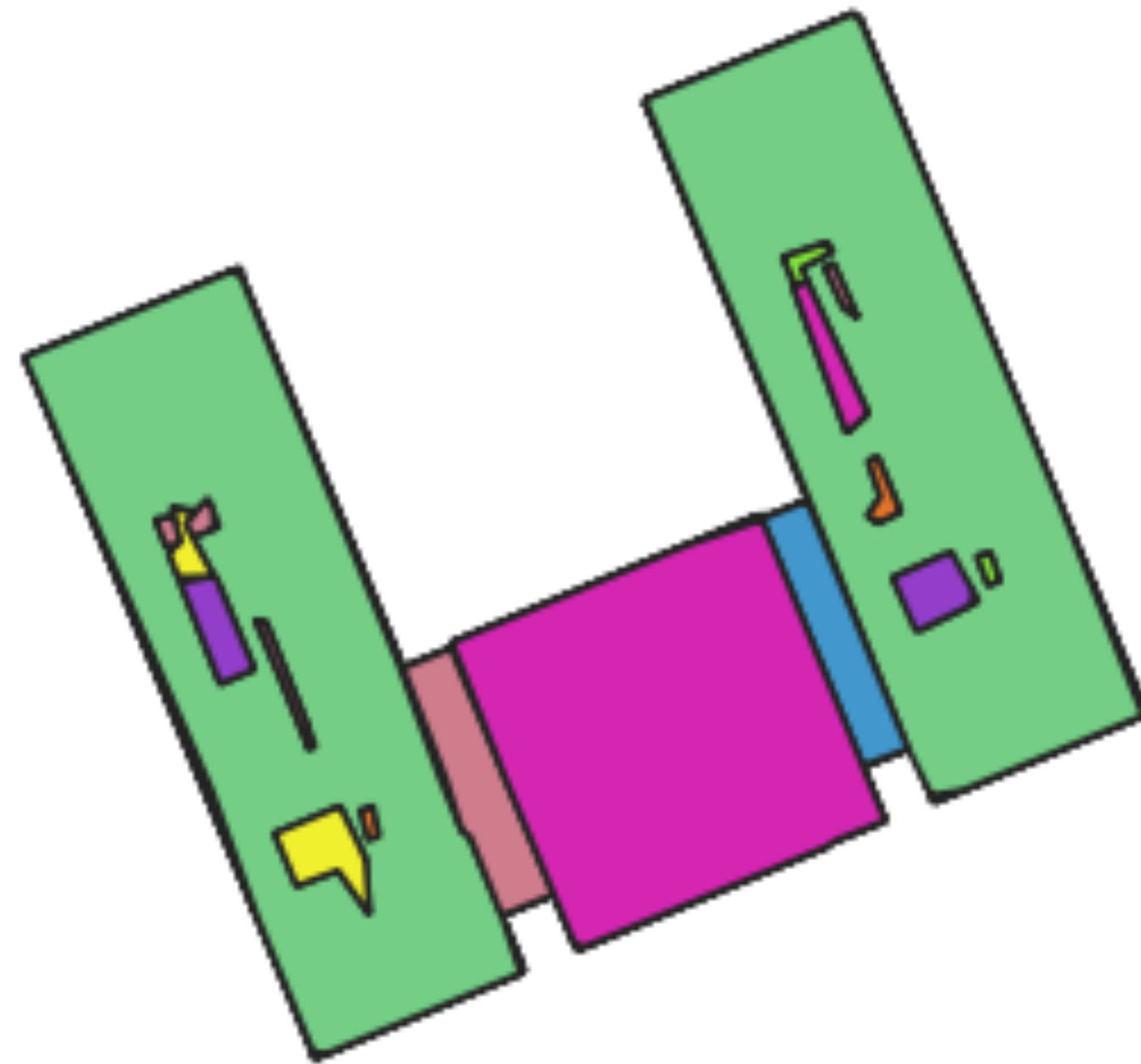**Credits where credits is due**

- Most lost points on trivial things

  - "roughness_index" => "roughness" (I used auto marking, remember)

  - Outputting the file in a folder you had, but I don't have it… so no file :\

- Everyone got 1/1 for uniqueness, I think all code was unique. Although the weighted centroid it was weird that so many used this trick (it was discussed in Discord, I know I know…)

Do not apply translation for CityJSON files!

You loose precision!

Visible with Meshlab

Use a tolerance for a normal: horizontal one was one example

How long did you
work on hw02?