The Topography Data

Queried and exported from "google earth engine", in .tiff format that has a numpy array. Can be read with python's tifffile.imread.

The dataset I received had the wrong resolution, as its shape was 379x559, when the LST's shape was 409x603. That would make it impossible to align the correct elevation to a sample.

In order to generate a correct resolution topography dataset I had to figure exactly how the LST dataset was made to recreate it in the google earth engine query.

<u>In the LST data:</u>
latitude, 603 points between 28.996716325654262 and 34.00777509644337
longitude, 409 points between 33.20034536095077 and 36.59654466075468

Found the length of the north and south borders to be 313km and 330km respectively, meaning the distance between each LST sample is changing.

After checking the difference between each longitude/latitude (in degrees), they were all equal ~1/120 of a degree :

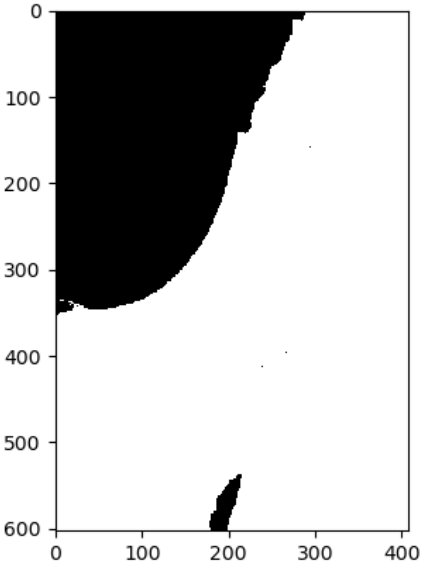
```
longs [0:-1] - longs[1:]
masked_array(data=[-0.00832402, -0.00832402, -0.00832402, -0.00832402,
                   -0.00832402, -0.00832402, -0.00832402, -0.00832402,
                   -0.00832402, -0.00832402, -0.00832402, -0.00832402,
```

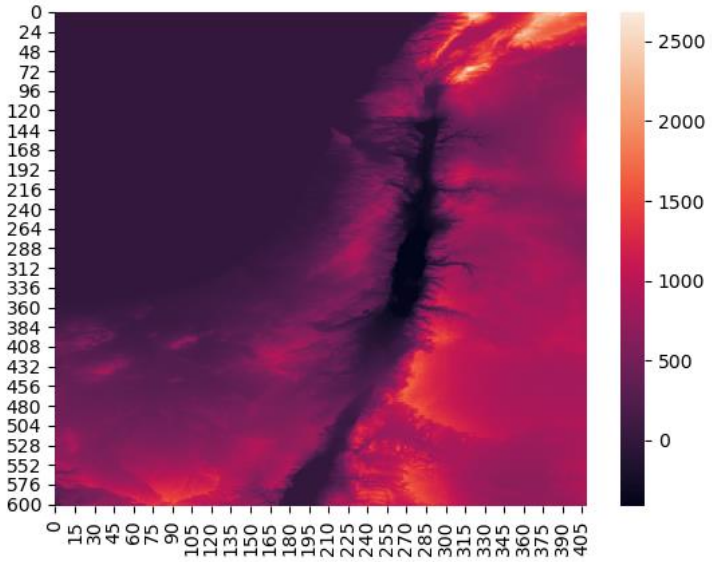
From the commonly used NASA topography dataset "USGS/SRTMGL1_003" it is documented to have resolution of arc-seconds (1/3600 of a degree), so rescaling 30x30 pixels to each output pixel is about right and possible.

I confirmed it by clipping the dataset to a rectangle within the bounding degrees of the LST data, and received shape (12228,18041), that matches: (max_degree-min-digree)/pixels ~= 1/3600.

I wrote a script in Earth Engine to scale this rectangle topography to dimensions of 409x603 just like the LST shape and exported a good looking .tiff file. (Script is saved near the data file)

Its min height is -415 and max height is 2687, which correctly describe the Dead Sea and the Hermon heights.






```
ax.imshow(image==0, cmap=plt.cm.binary, interpolation='nearest')
sns.heatmap(image_f)
```