**Choosing a location for a well**

Let's say you work for the mining company GlavRosGosNeft. We need to decide where to drill a new well.

The steps for choosing a location are usually as follows:

• Characteristics for wells are collected in the selected region: oil quality and volume of its reserves;

• Build a model to predict the volume of reserves in new wells;

• Select wells with the highest value estimates;

• Determine the region with the maximum total profit of the selected wells.

You have been provided with oil samples in three regions. The characteristics for each well in the region are already known. Build a model to determine the region where mining will bring the most profit. Analyze possible profits and risks using the Bootstrap technique.

**Data description**

Geological exploration data of three regions are in the files:

• /datasets/geo\_data\_0.csv

• /datasets/geo\_data\_1.csv

• /datasets/geo\_data\_2.csv

• id – unique identifier of the well;

• f0, f1, f2 — three signs of points (it doesn't matter what they mean, but the signs themselves are significant);

• product — volume of reserves in the well (thousand barrels).

**Conditions of the problem:**

• Only linear regression is suitable for training the model (the rest are not predictable enough).

• During the exploration of the region, 500 points are explored, from which, using machine learning, the best 200 are selected for development.

• The budget for the development of wells in the region is 10 billion rubles.

• At current prices, one barrel of raw materials brings 450 rubles of income. The income from each unit of the product is 450 thousand rubles, since the volume is indicated in thousands of barrels.

• After assessing the risks, you should leave only those regions in which the probability of losses is less than 2.5%. Among them, choose the region with the highest average profit.

Synthetic data: details of contracts and characteristics of deposits were not disclosed.