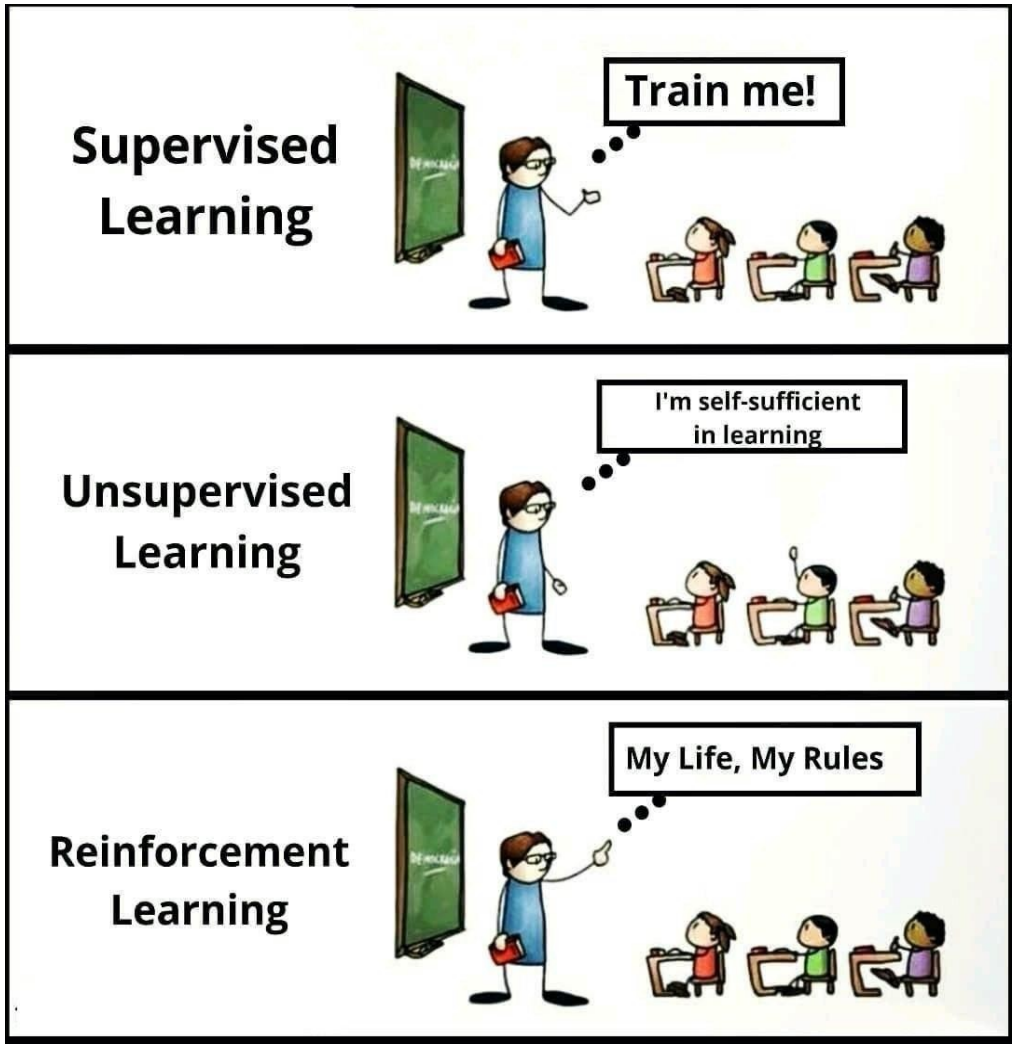
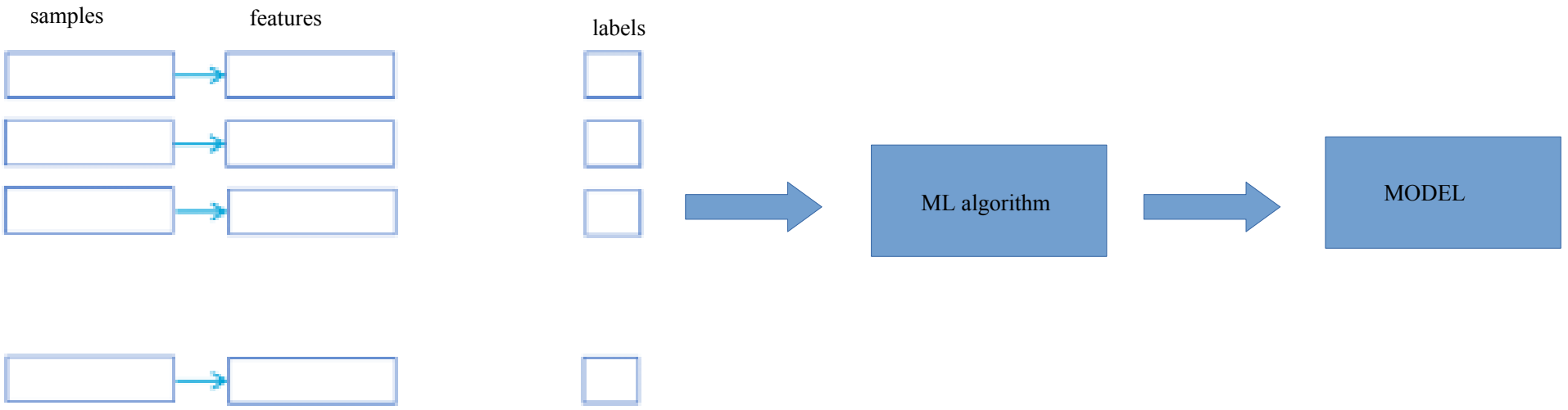
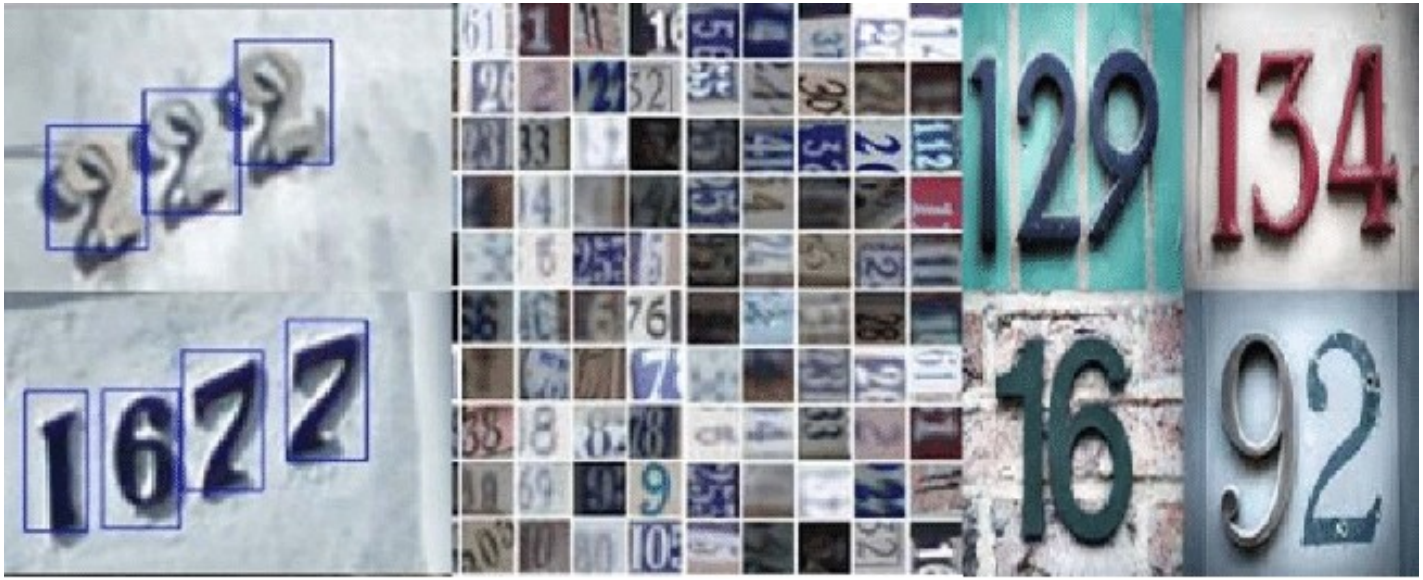
Элементы машинного обучения


Supervised Learning
Train me!
Unsupervised Learning
I'm self-sufficient in learning
Reinforcement Learning
My Life, My Rules

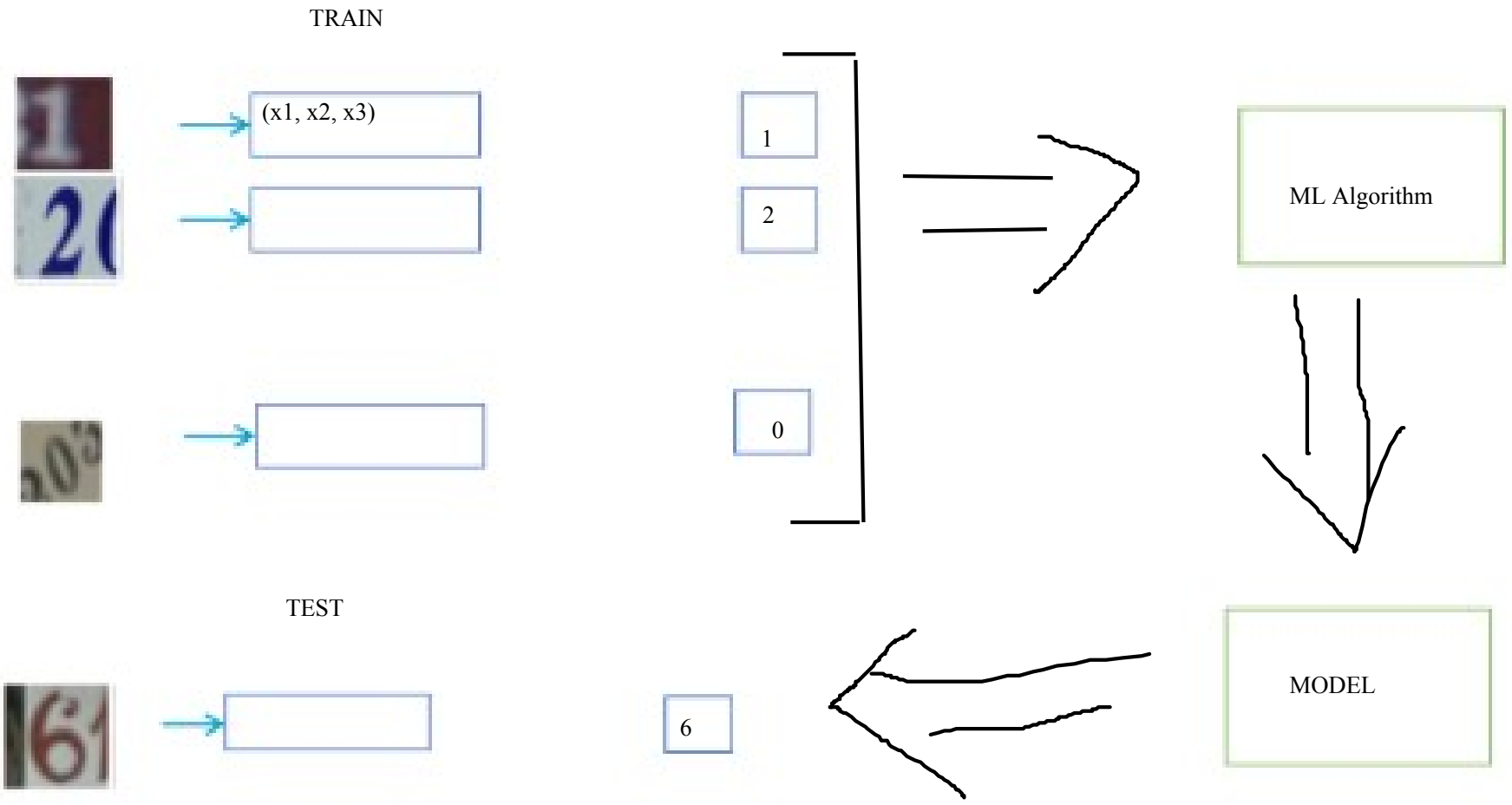
Supervised Learning (обучение с учителем)

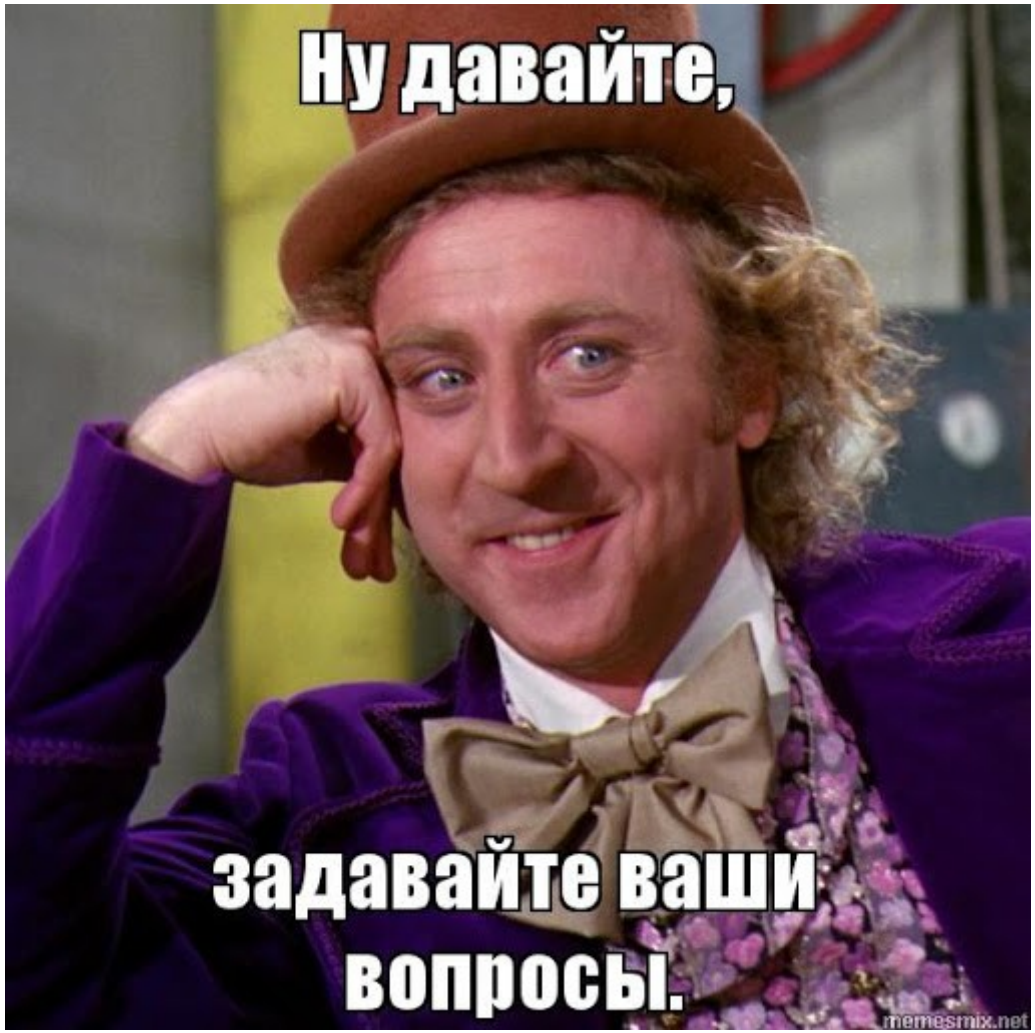


Street View House Numbers



32x32 pixels
10 classes
~70000 train
~25000 test

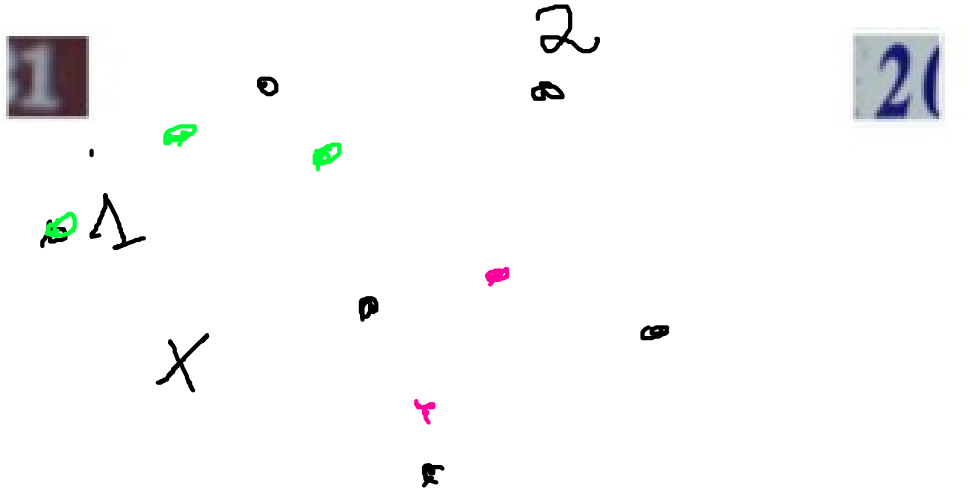

TRAIN
(x1, x2, x3)
1
2
0
ML Algorithm
TEST
6
MODEL


Ну давайте,
задавайте ваши вопросы.
memesmix.net

Метод ближайших соседей

```
Train:
      просто все запомнить
```

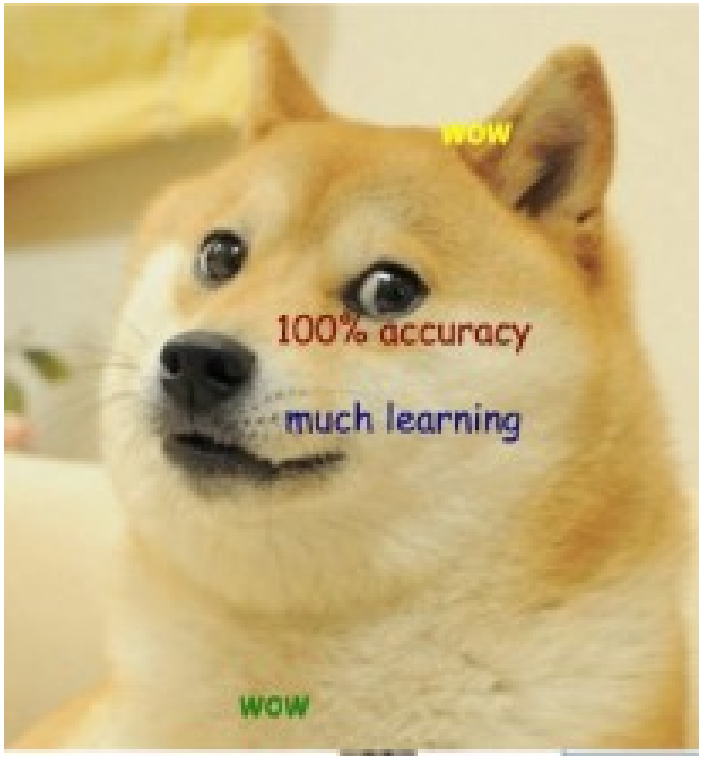
```
Predict:
      найти ближайший
      и выдать его класс
```



$$L_2 = \sqrt{\sum_i (v_i - u_i)^2}$$

$$L_1 = \sum_i |v_i - u_i|$$

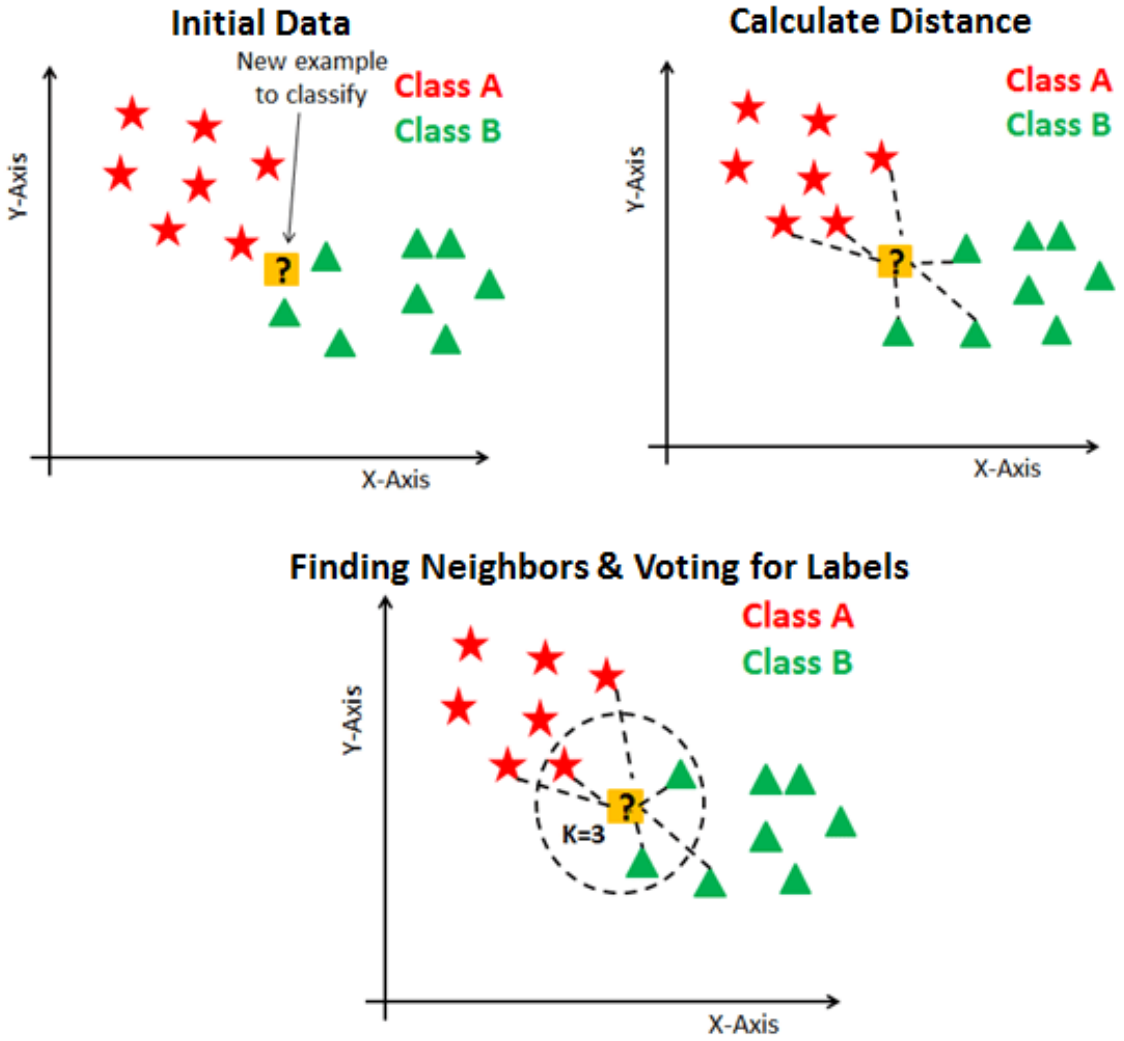
Точность на тренировочных vs тестовых данных

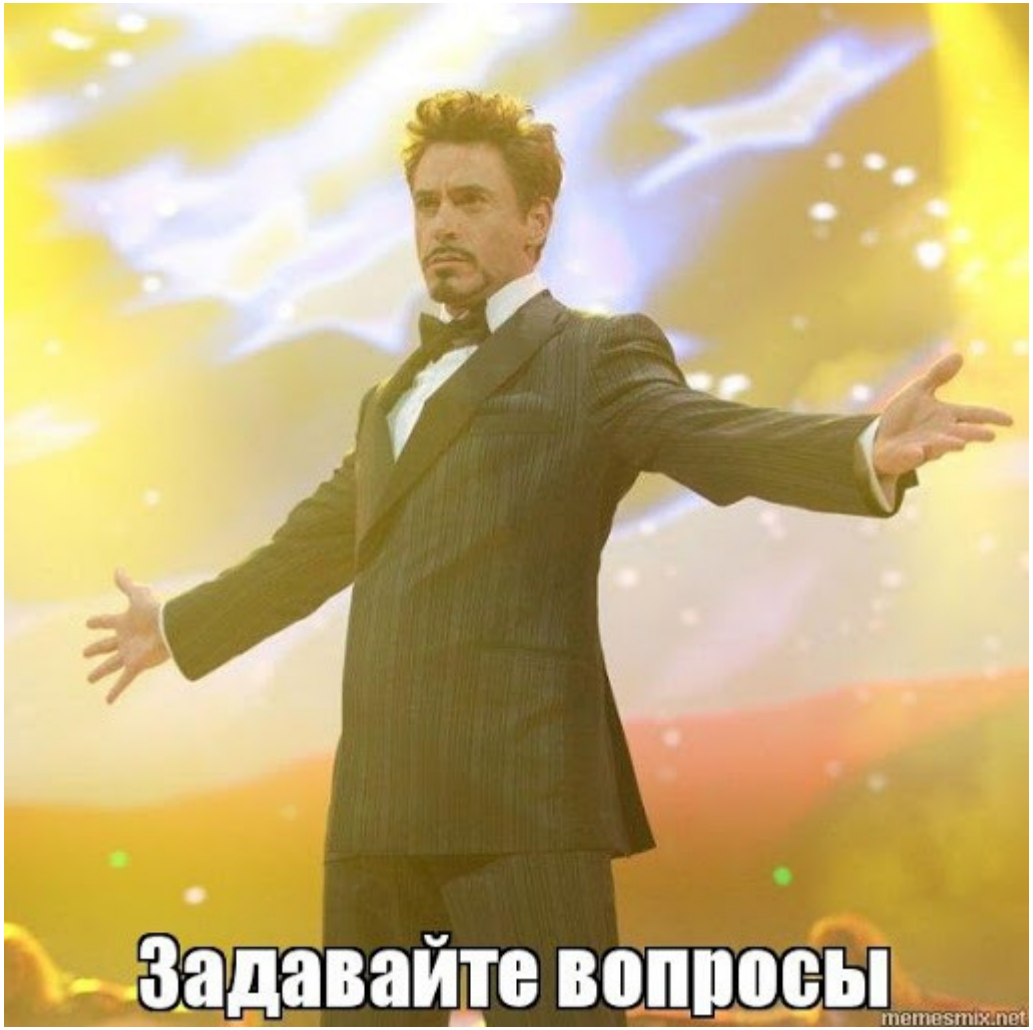

wow
100% accuracy
much learning
wow

Метод k-nearest neighbors

Как выбрать K?

K - hyper-parameter




Задавайте вопросы
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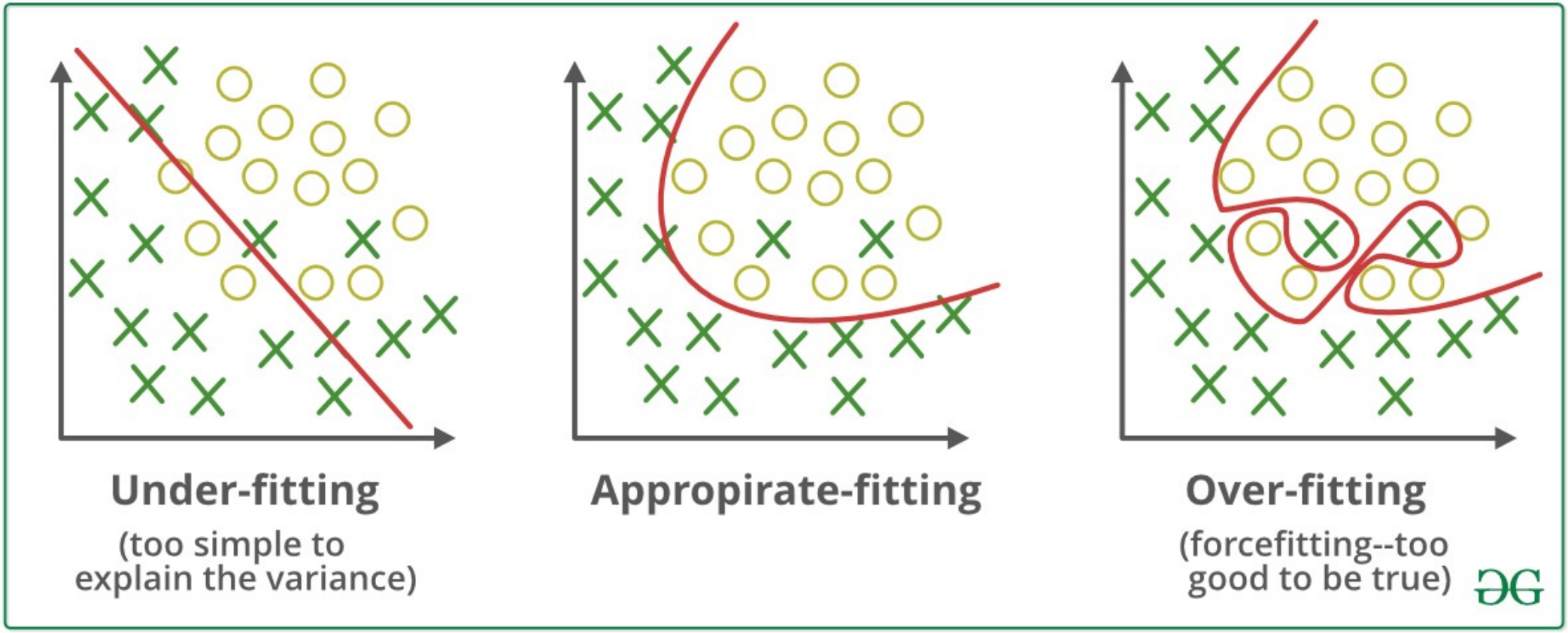
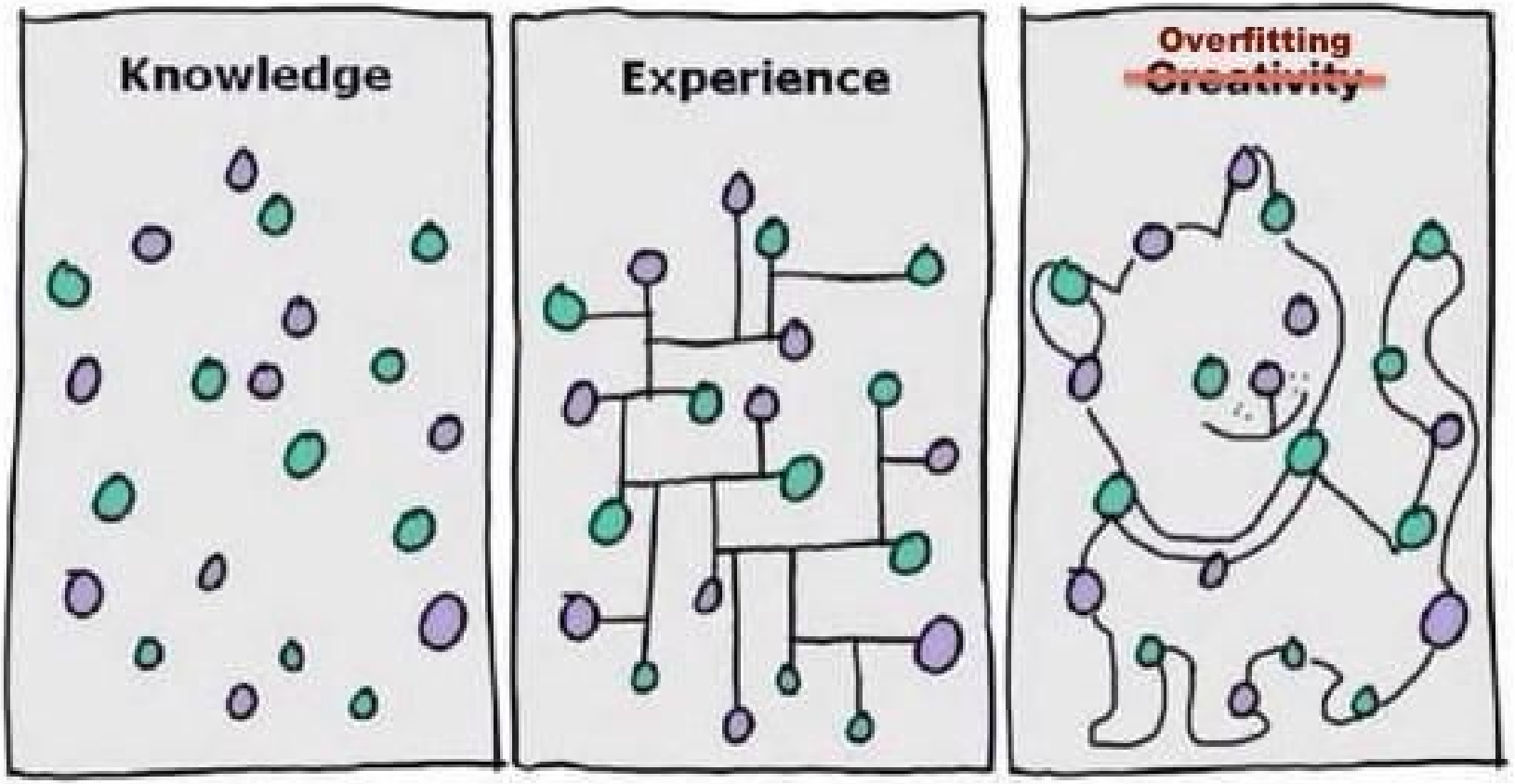
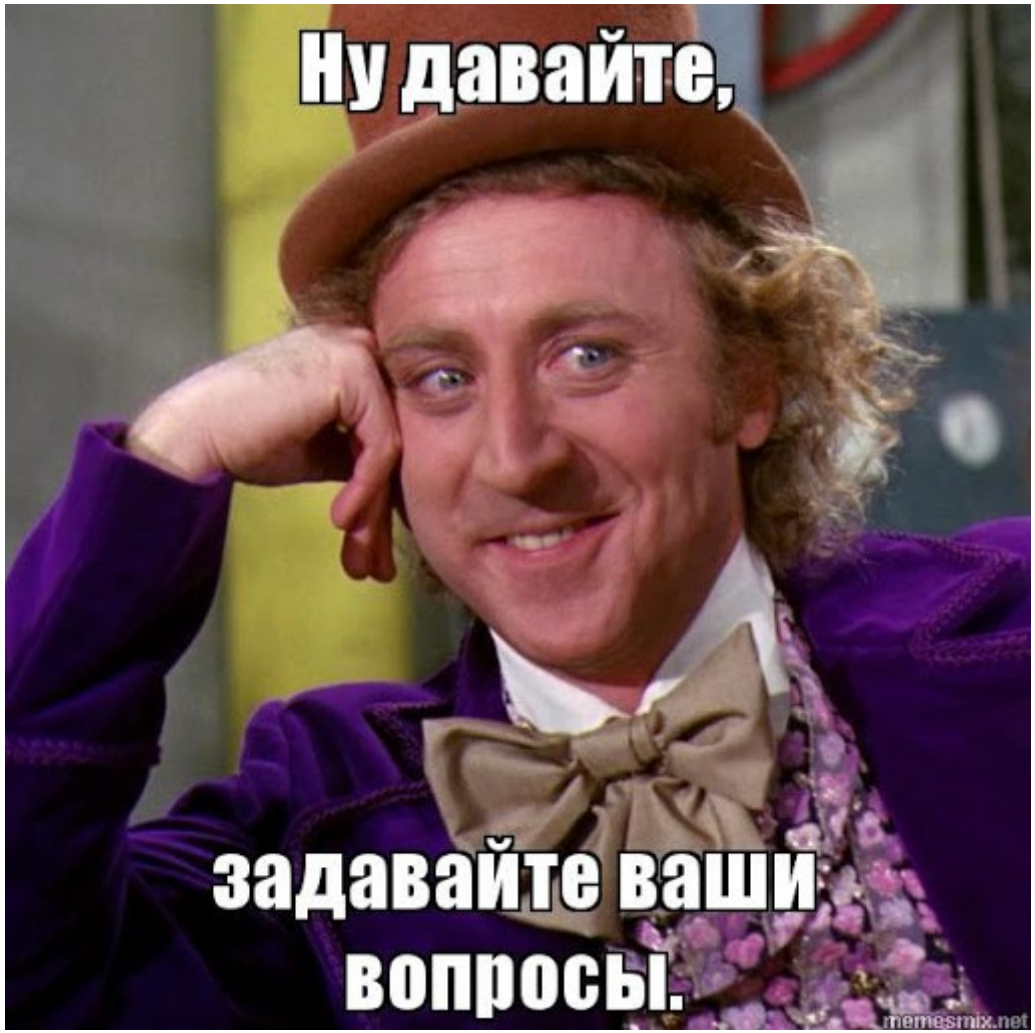
Переобучение и недообучение




Knowledge
Experience
Overfitting
Creativity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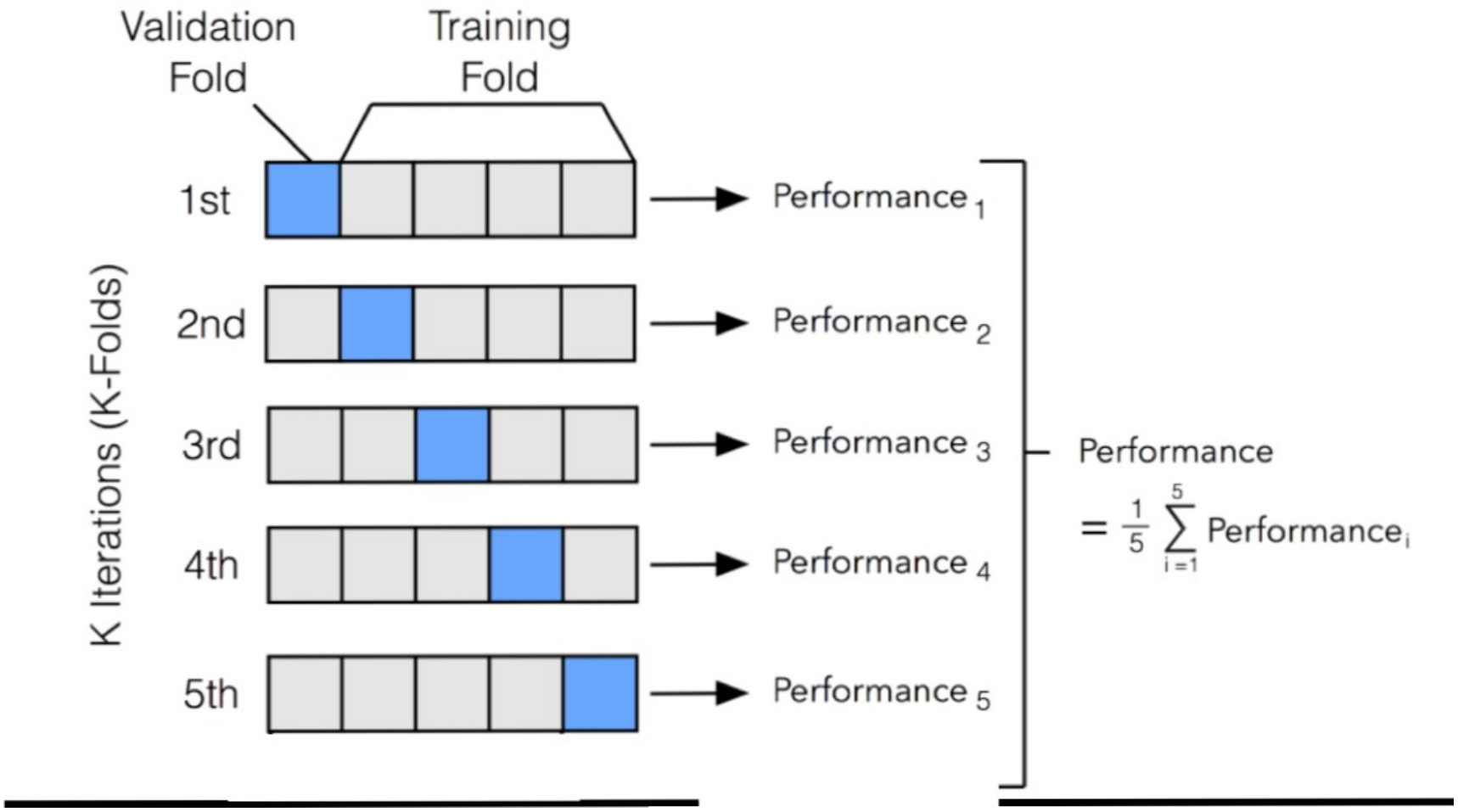
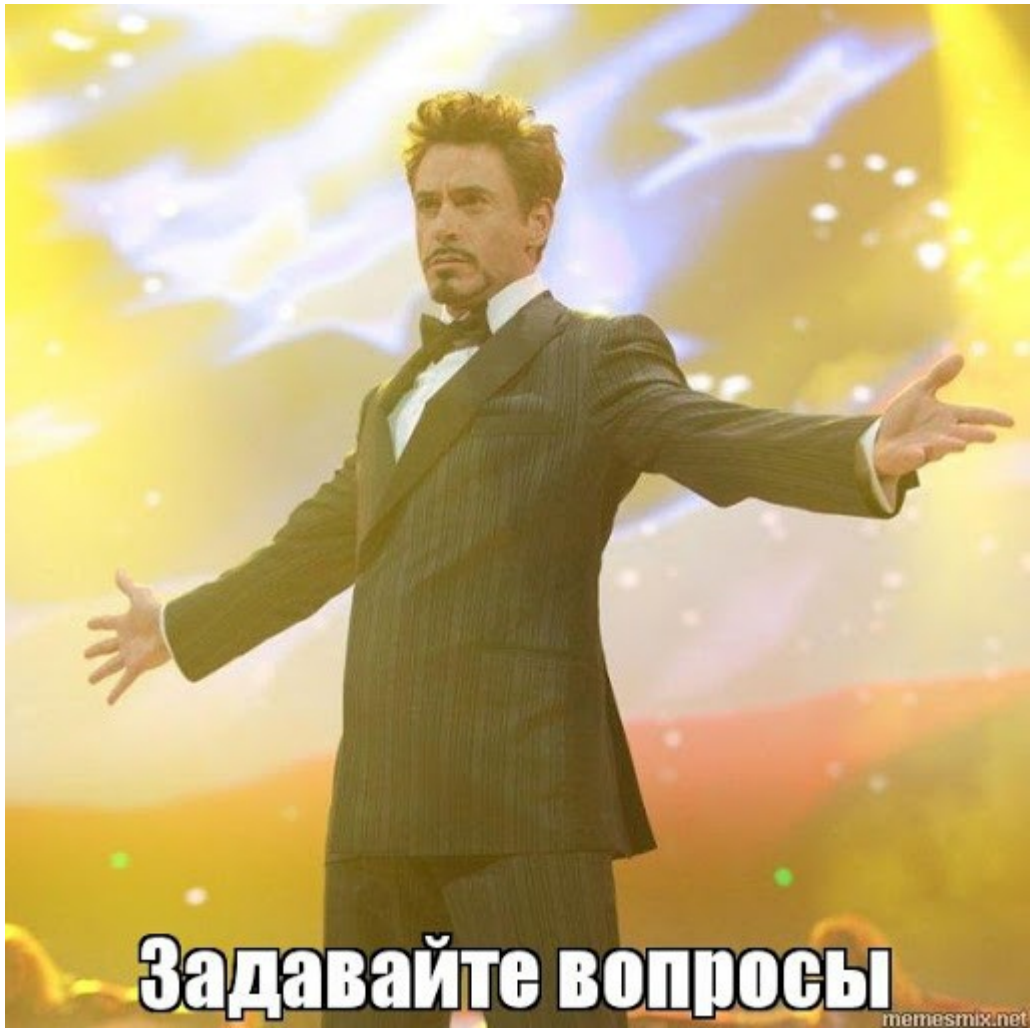
Типы выборок

Cross-validation




Задавайте вопросы
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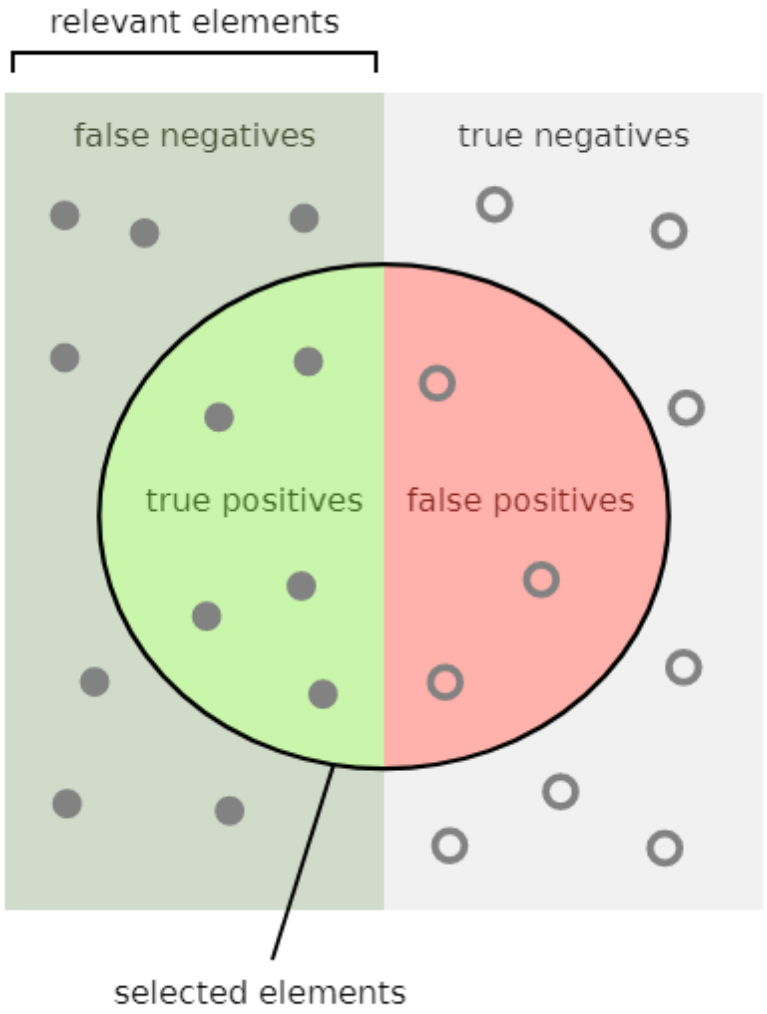
Метрики классификации

$$F_1 = 2 * \frac{precision * recall}{precision + recall}$$

Точность

$$Accuracy = \frac{correct}{total}$$



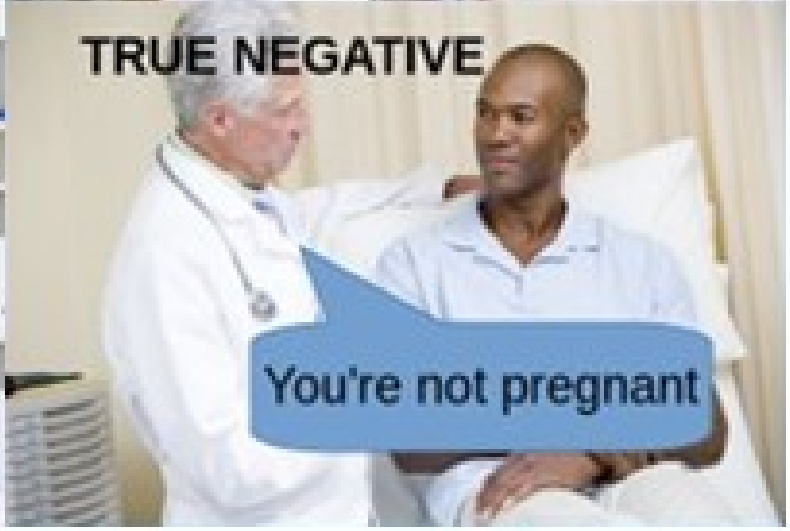
How many selected items are relevant?

$$Precision = \frac{\text{true positives}}{\text{selected elements}}$$

How many relevant items are selected?

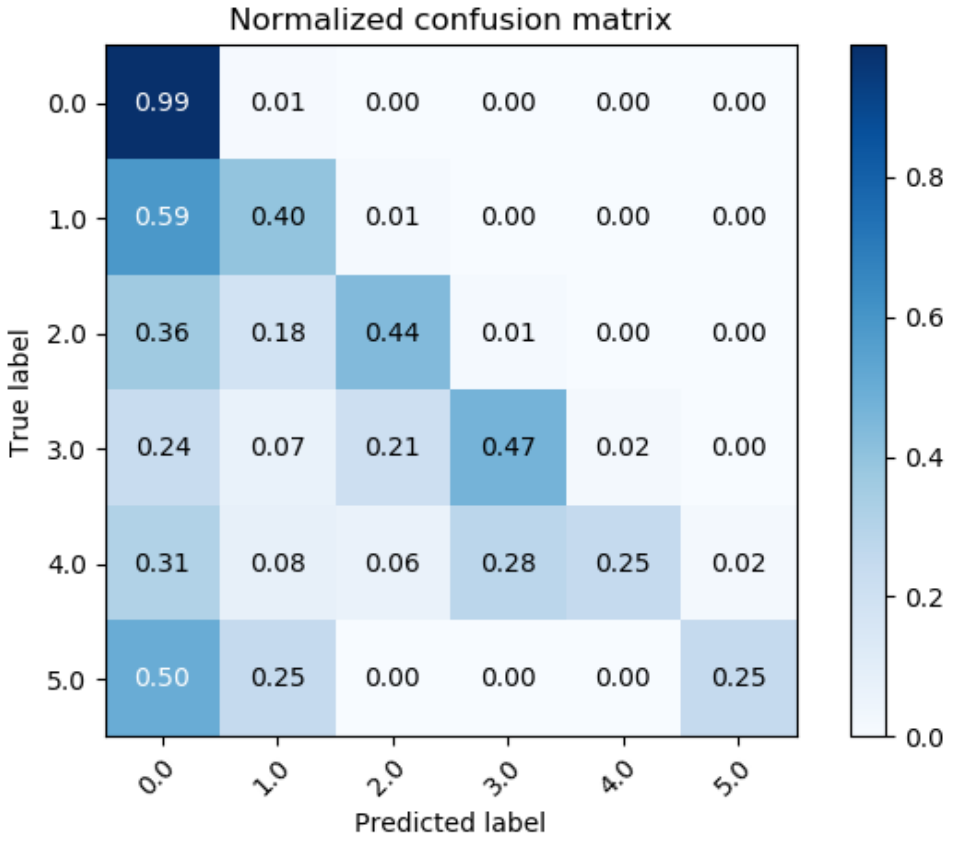
$$Recall = \frac{\text{true positives}}{\text{relevant elements}}$$

Actual Values

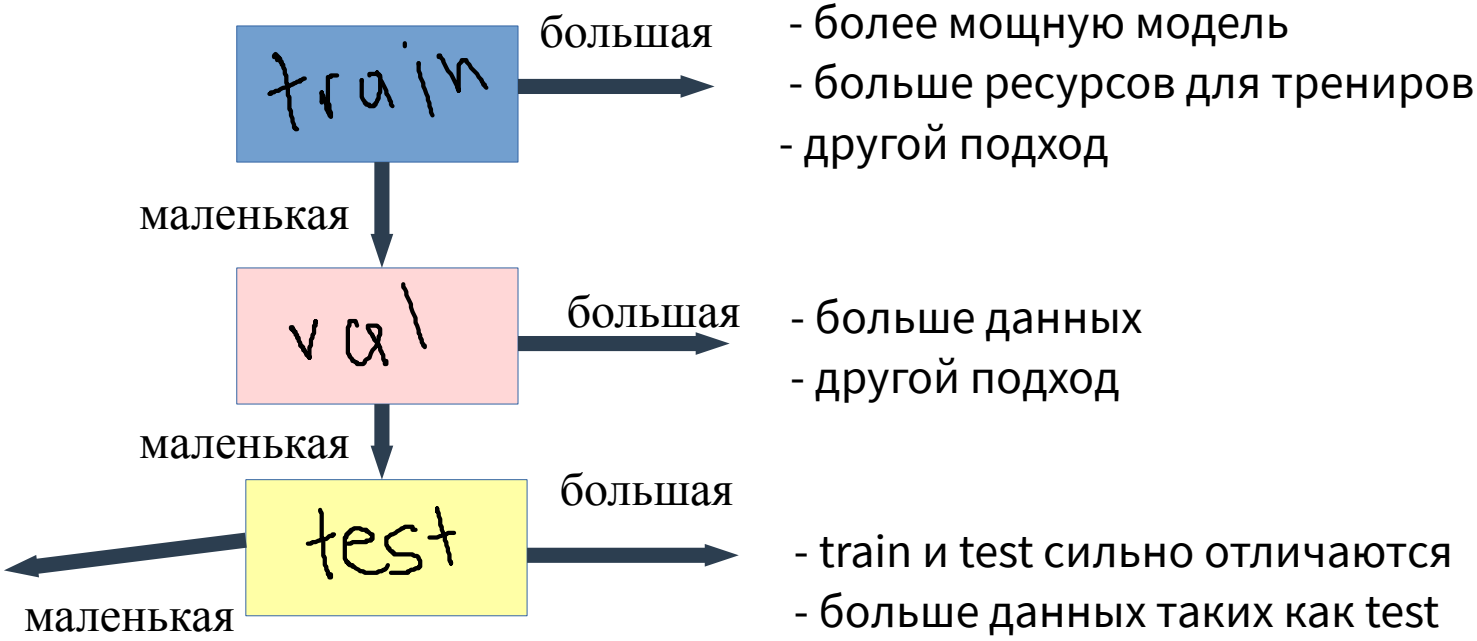
Predicted Values	1	0
1		
0		

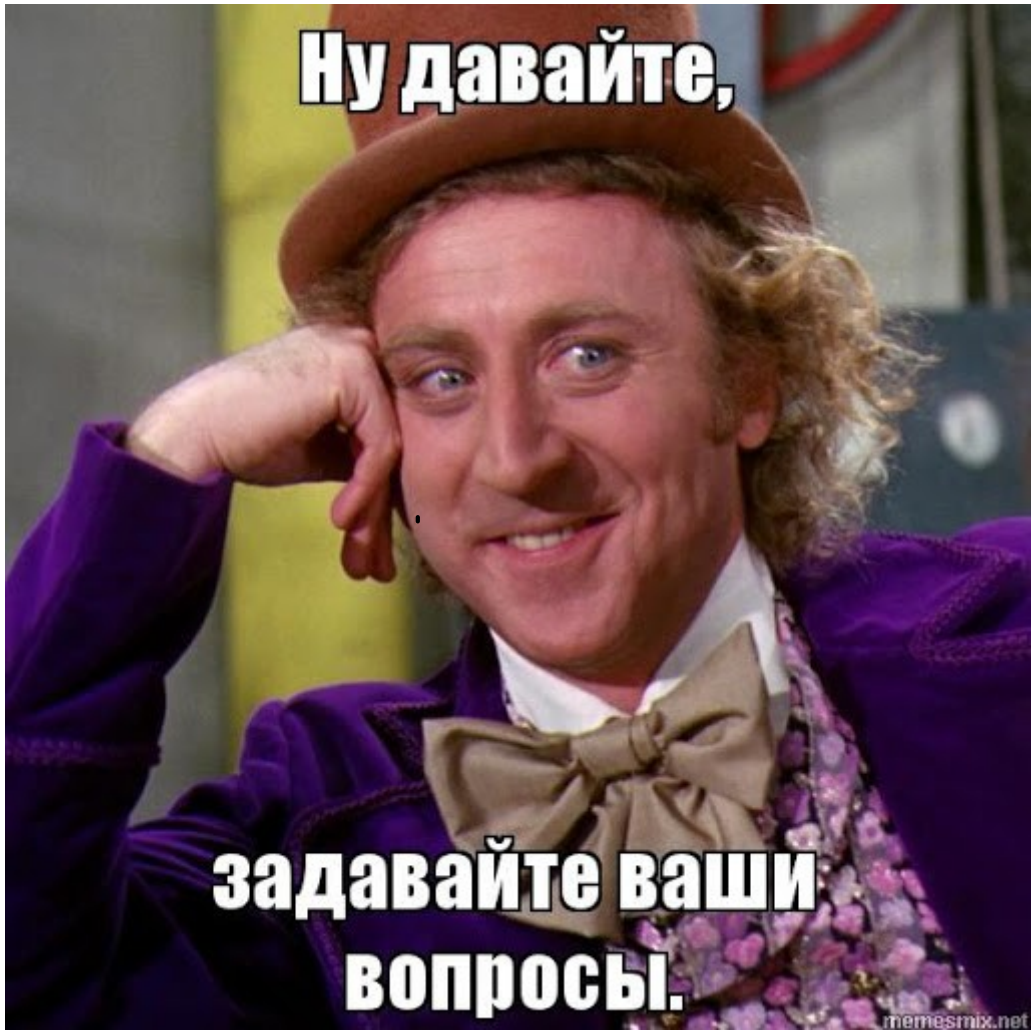
Multi-class classification

Confusion matrix



Общий алгоритм обработки ошибок

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