Intro Hook Explore Explain Apply Share Evaluate Expand

HSE Data Science Hack

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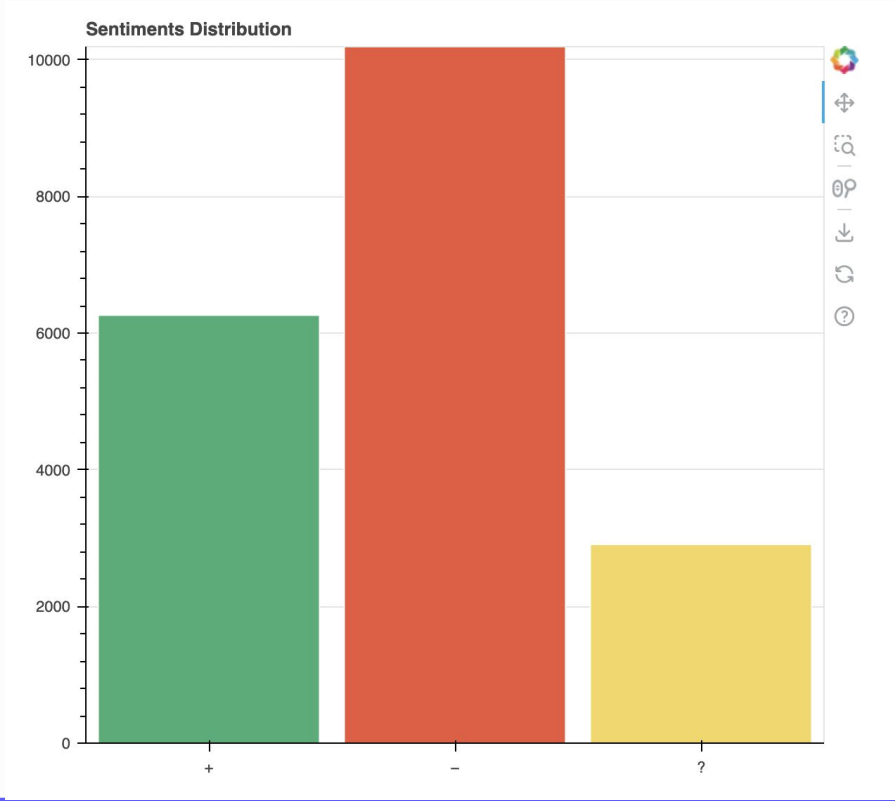
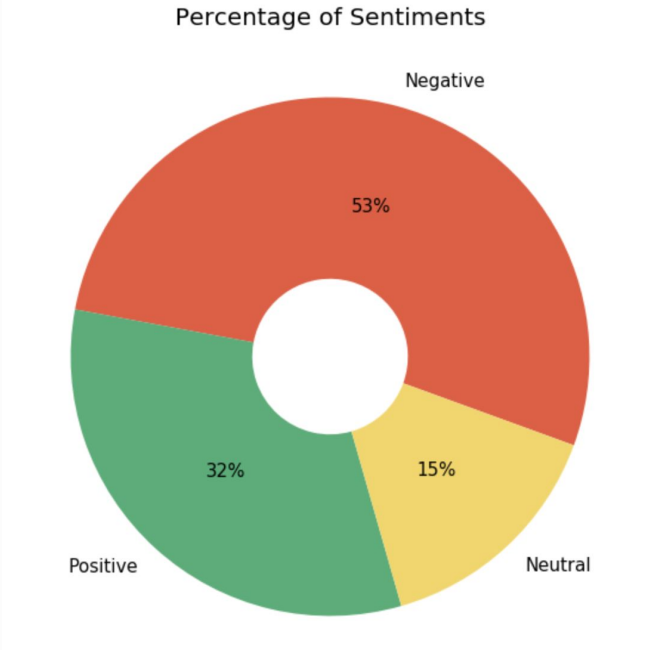
Баланс классов



Баланс классов



Mean word counts

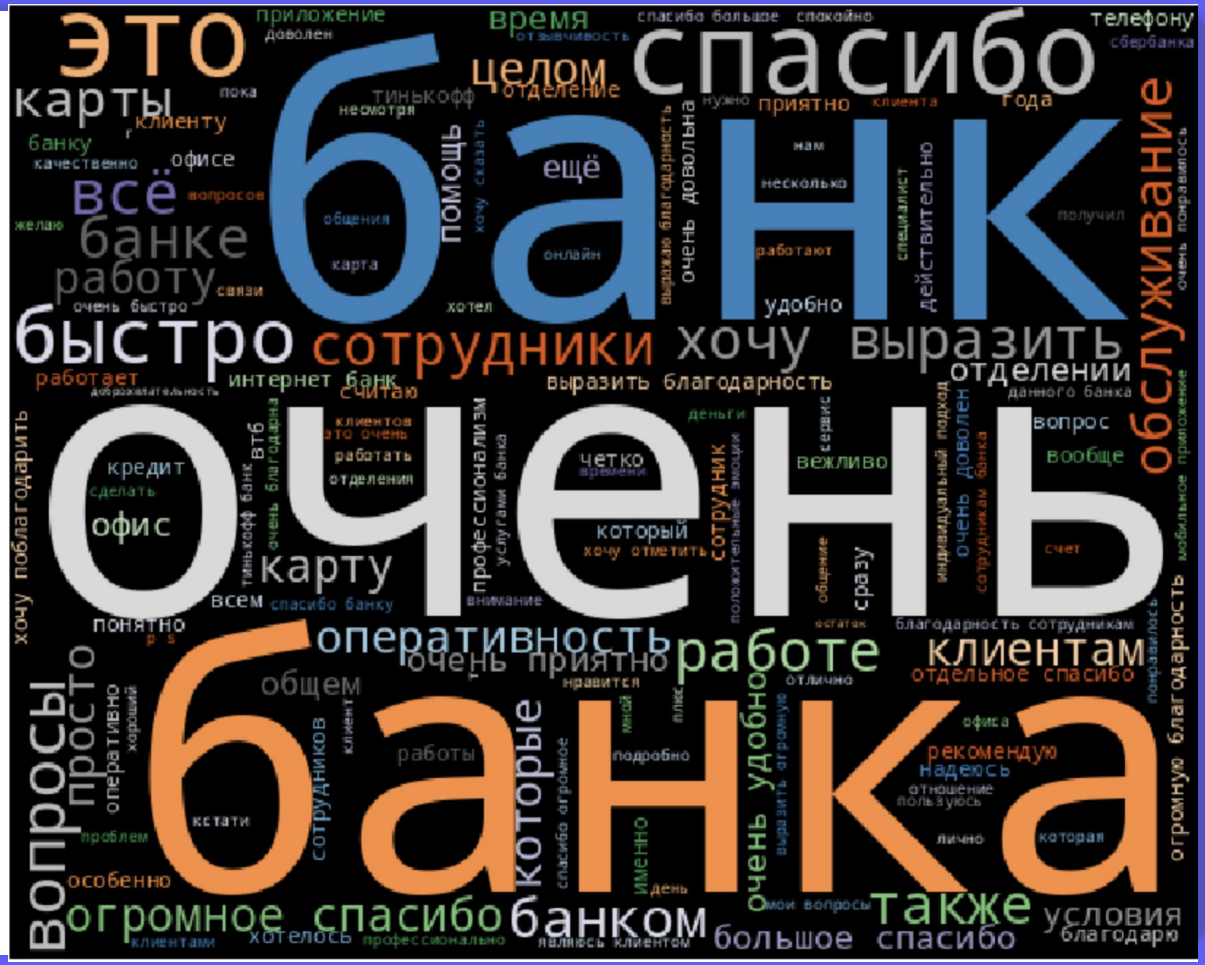
In all categories: **5.97**

Positive: **6.24**

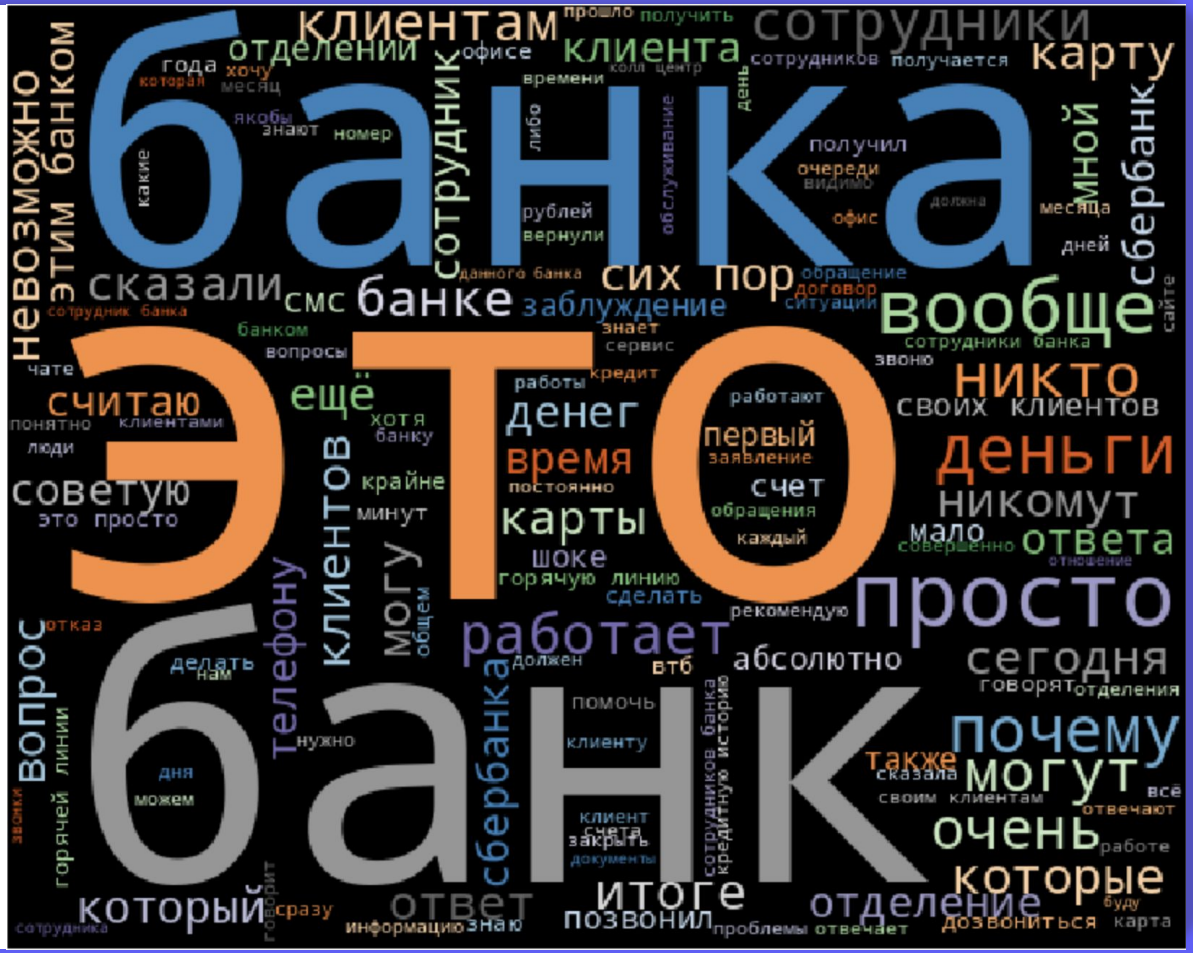
Negative: **5.86**

general word cloud on lemmatized data:

positive messages word cloud:



negative messages word cloud:



Использование Yandex Datasphere

Итоги:

- Создали проект
- Подключили s3 (сохраняли чекпоинты модели)
- Подключили git

Проблемы:

- kernel самопроизвольно перезапускается, значения всех переменных пропадают
- Проблемы с зависимостями

Препроцессинг данных

- Удаление пунктуации
- Лемматизация через pymorphy2
- Векторизация

Бейзлайн

Комбинация	RandomForestClassifier
TfidfVectorizer	0.9289
CountVectorizer	0.9293
TfidfVectorizer w/lemm	0.9314
CountVectorizer w/lemm	0.9332

Сентимент

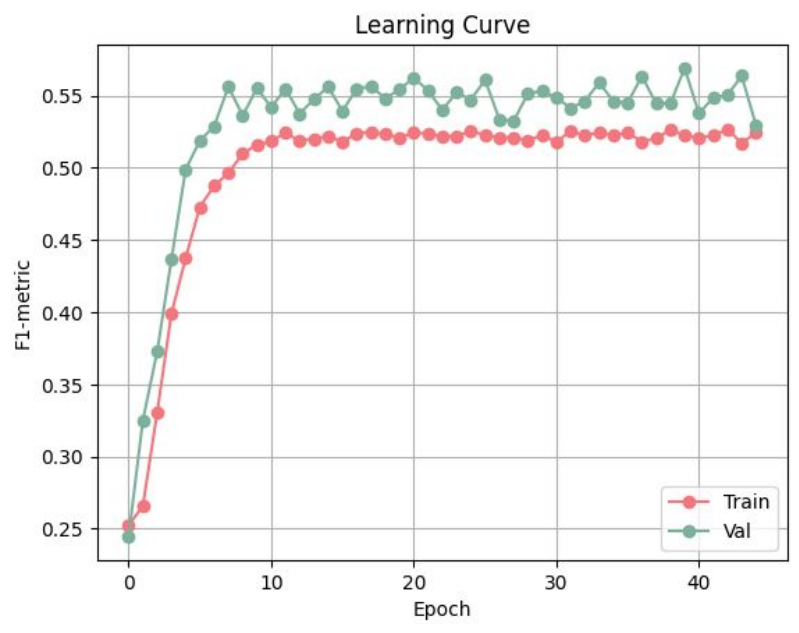
Модель	**ROC-AUC score**
RandomForestClassifier	0.9332
Catboost	0.9304
Catboost + Optuna	0.9279
Rubert finetuned (46 эпох)	~ 0.55

```
0:      learn: 0.6013545        test: 0.5916366 best: 0.5916366 (0)     total: 186ms    remaining: 15m 27s
100:    learn: 0.7813935        test: 0.7392876 best: 0.7392876 (100)   total: 14.6s    remaining: 11m 47s
200:    learn: 0.8153122        test: 0.7640681 best: 0.7656169 (192)   total: 29.2s    remaining: 11m 38s
300:    learn: 0.8395317        test: 0.7862674 best: 0.7862674 (296)   total: 43.6s    remaining: 11m 19s
400:    learn: 0.8570937        test: 0.7924626 best: 0.7950439 (389)   total: 57.4s    remaining: 10m 58s
500:    learn: 0.8702365        test: 0.7976252 best: 0.7976252 (489)   total: 1m 10s   remaining: 10m 35s
600:    learn: 0.8797635        test: 0.8079504 best: 0.8084667 (580)   total: 1m 23s   remaining: 10m 14s
700:    learn: 0.8861915        test: 0.8151781 best: 0.8156944 (691)   total: 1m 37s   remaining: 9m 58s
800:    learn: 0.8921028        test: 0.8187919 best: 0.8187919 (774)   total: 1m 50s   remaining: 9m 40s
900:    learn: 0.8980716        test: 0.8229220 best: 0.8249871 (876)   total: 2m 4s    remaining: 9m 27s
1000:   learn: 0.9018595        test: 0.8327310 best: 0.8332473 (989)   total: 2m 18s   remaining: 9m 12s
1100:   learn: 0.9054752        test: 0.8337636 best: 0.8347961 (1081)  total: 2m 32s   remaining: 8m 58s
1200:   learn: 0.9089761        test: 0.8347961 best: 0.8353123 (1188)  total: 2m 46s   remaining: 8m 45s
1300:   learn: 0.9127640        test: 0.8404750 best: 0.8415075 (1289)  total: 2m 59s   remaining: 8m 31s
1400:   learn: 0.9143136        test: 0.8446051 best: 0.8456376 (1369)  total: 3m 13s   remaining: 8m 17s
1500:   learn: 0.9161501        test: 0.8477026 best: 0.8477026 (1480)  total: 3m 27s   remaining: 8m 3s
1600:   learn: 0.9174702        test: 0.8487352 best: 0.8487352 (1596)  total: 3m 41s   remaining: 7m 50s
1700:   learn: 0.9189624        test: 0.8502839 best: 0.8502839 (1662)  total: 3m 56s   remaining: 7m 38s
1800:   learn: 0.9204545        test: 0.8492514 best: 0.8502839 (1662)  total: 4m 11s   remaining: 7m 26s
1900:   learn: 0.9218893        test: 0.8513165 best: 0.8518327 (1856)  total: 4m 26s   remaining: 7m 14s
2000:   learn: 0.9228076        test: 0.8523490 best: 0.8528653 (1963)  total: 4m 41s   remaining: 7m 2s
2100:   learn: 0.9231520        test: 0.8513165 best: 0.8528653 (1963)  total: 4m 56s   remaining: 6m 49s
2200:   learn: 0.9243572        test: 0.8523490 best: 0.8528653 (1963)  total: 5m 11s   remaining: 6m 36s
2300:   learn: 0.9251033        test: 0.8549303 best: 0.8554466 (2282)  total: 5m 27s   remaining: 6m 23s
2400:   learn: 0.9258494        test: 0.8569954 best: 0.8575116 (2397)  total: 5m 42s   remaining: 6m 10s
2500:   learn: 0.9261364        test: 0.8554466 best: 0.8580279 (2433)  total: 5m 57s   remaining: 5m 57s
2600:   learn: 0.9263659        test: 0.8559628 best: 0.8580279 (2433)  total: 6m 11s   remaining: 5m 42s
2700:   learn: 0.9268251        test: 0.8554466 best: 0.8580279 (2433)  total: 6m 26s   remaining: 5m 28s
2800:   learn: 0.9272268        test: 0.8554466 best: 0.8580279 (2433)  total: 6m 41s   remaining: 5m 14s
2900:   learn: 0.9272842        test: 0.8554466 best: 0.8580279 (2433)  total: 6m 56s   remaining: 5m 1s
Stopped by overfitting detector  (500 iterations wait)

bestTest = 0.8580278782
bestIteration = 2433

Shrink model to first 2434 iterations.
```

	precision	recall	f1-score	support
0	0.87	0.90	0.89	626
1	0.65	0.49	0.56	291
2	0.89	0.94	0.91	1020
accuracy			0.86	1937
macro avg	0.81	0.78	0.79	1937
weighted avg	0.85	0.86	0.85	1937

RuBERT fine-tuning

- DeepPavlov/rubert-base-cased
- Замораживание весов предобученной модели, дообучение классифицирующей головы (два линейных слоя), использование StepLR
- Количество эпох: 45



Категории

- Preprocessing:
  - токенизация,
  - лемматизация,
  - удаление стоп-слов,
  - TfIdfVectorizer,
  - MultiLabelBinarizer

- RandomForestClassifier(n_estimators=300)

ROC-AUC: 0.825