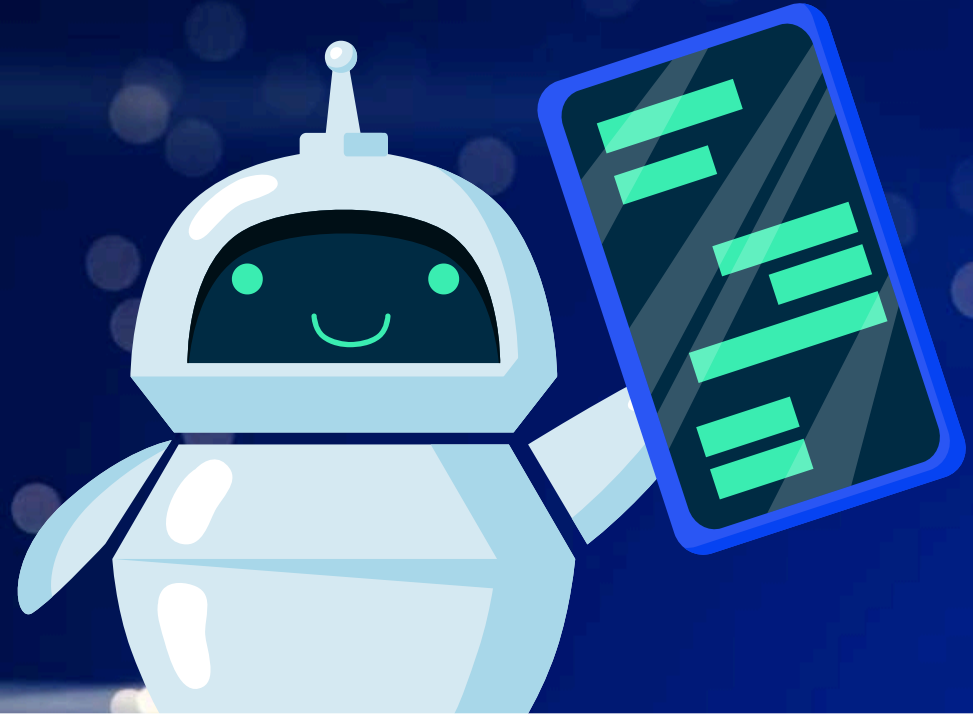# Yönetici Asistanı

Metehan Sarıbaş

Projenin amacı, bir banka ile ilgili müşteri şikayetlerini analiz ederek şikayetleri kategorik olarak sınıflandırıp özetleyerek, mini- instruct LLM'e özeti iletip çözüm sunmasını sağlamak.
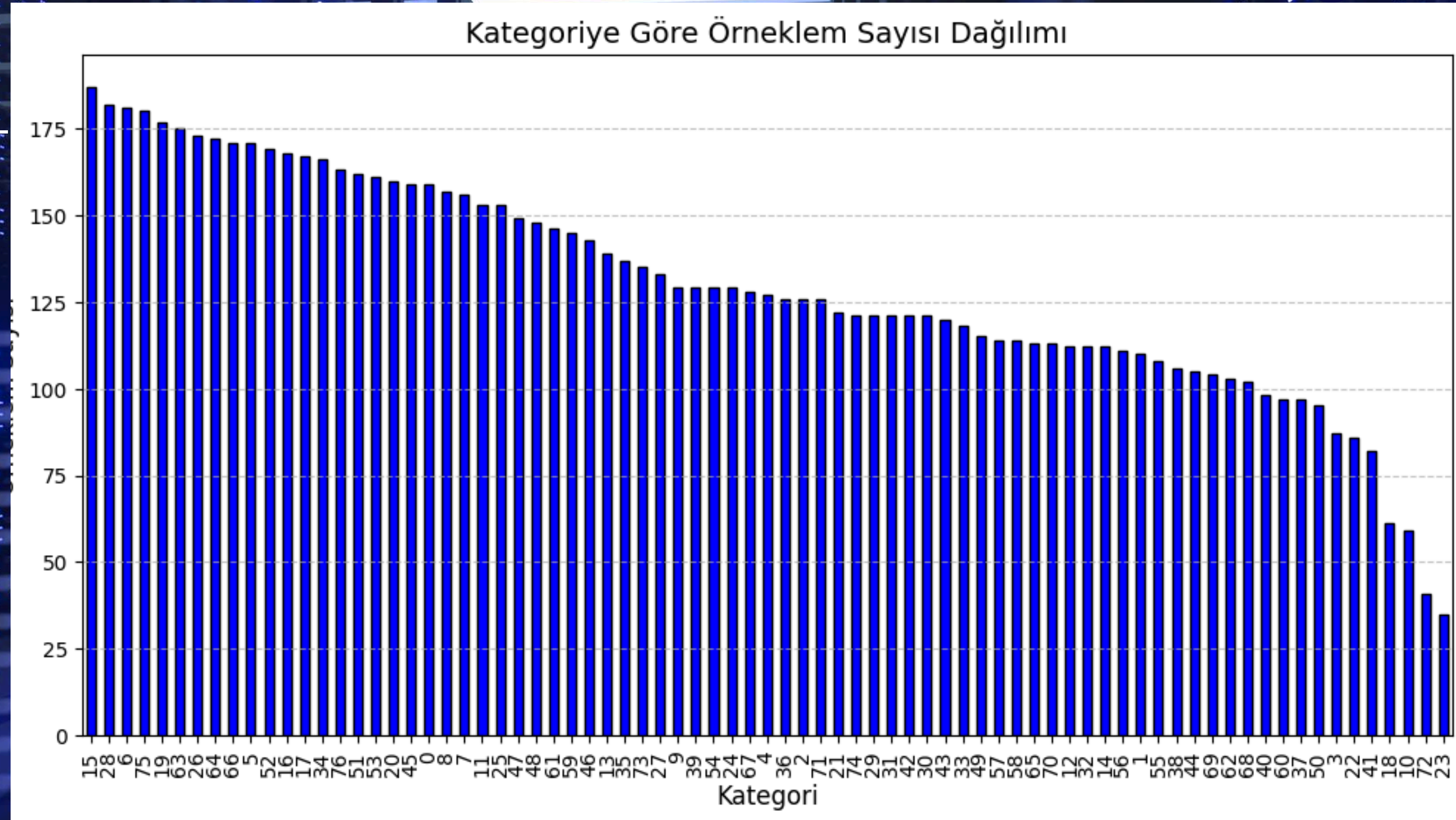
Veri Analizi

Sınıflandırma modeli eğitmek.

Özetleme modeli kullanımı

LLM kullanımı

I

II

III

IV

- **Label Frekansları**

- **6:**
- **balance_not_updated_after_cheque_or_cash_deposit**
- **72 : virtual_card_not_working**


Kategoriye Göre Örneklem Sayısı Dağılımı

Kategoriye Göre Örneklem Sayısı Dağılımı
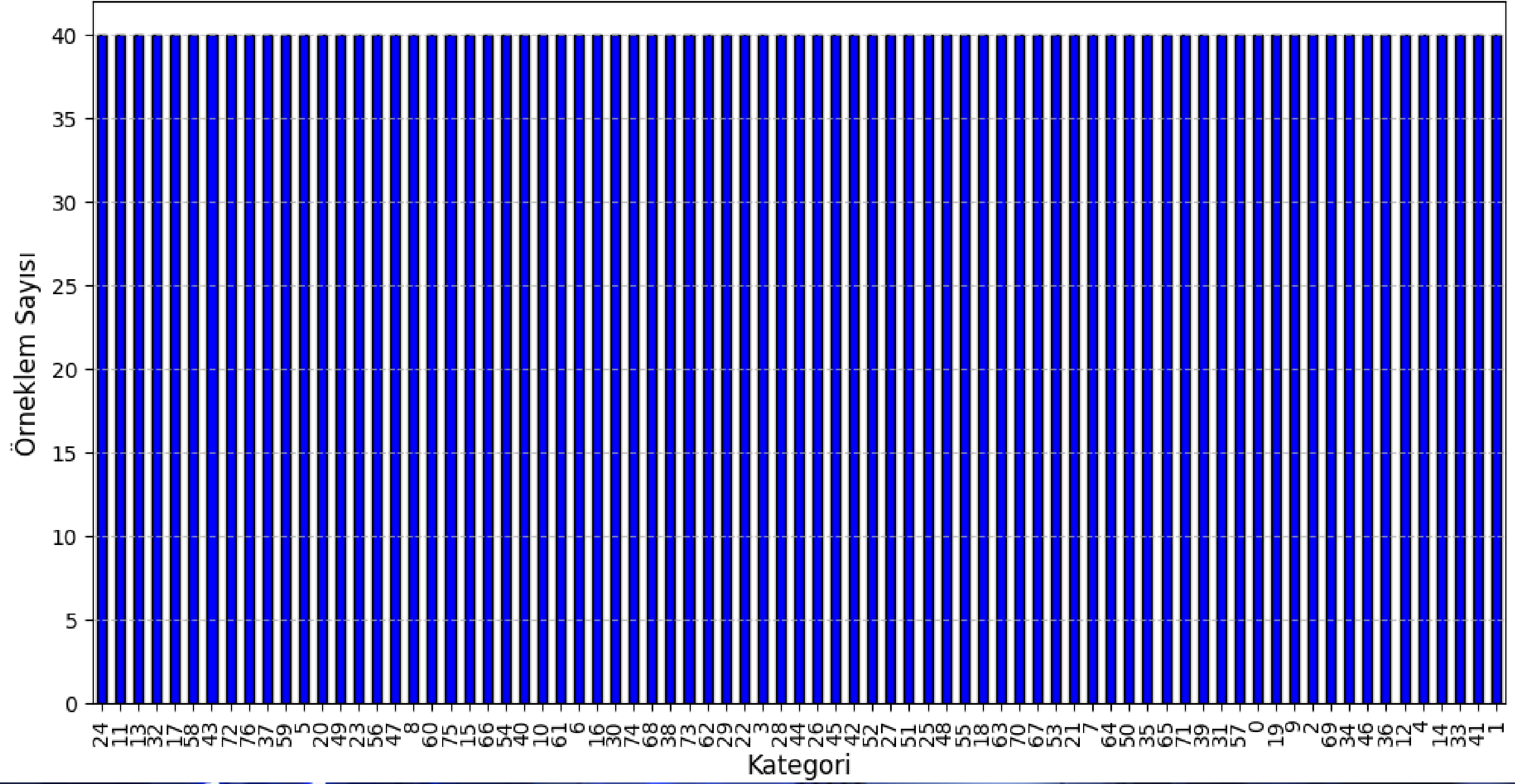
Özellik	Transformer	BERT
Mimari Yapı	Hem encoder hem decoder kullanır.	Sadece encoder kullanır.
Kullanım Amacı	Çok çeşitli NLP görevlerinde kullanılır.	Özellikle metin anlama görevlerine odaklanır.
Bağlam Bilgisi	Genellikle tek yönlü bağlam kullanır.	Çift yönlü bağlam kullanır.
Eğitim Stratejisi	Çoğunlukla sıralı görevler için (örneğin, çeviri) tasarlanmıştır ve sıralı olarak eğitilir.	Maskelenmiş Dil Modeli (MLM) ve Next Sentence Prediction (NSP) kullanılır.
Örnek Görevler	Çeviri, metin özetleme gibi sıralı görevler.	Soru-cevap, metin sınıflandırma, duygu analizi gibi görevler.
Performans ve Uygulama Alanları	Çeviri, özetleme, vb. gibi genel görevler için uygundur.	Metin sınıflandırma, soru-cevap, vb. metin anlamayı gerektiren görevlerde etkili.
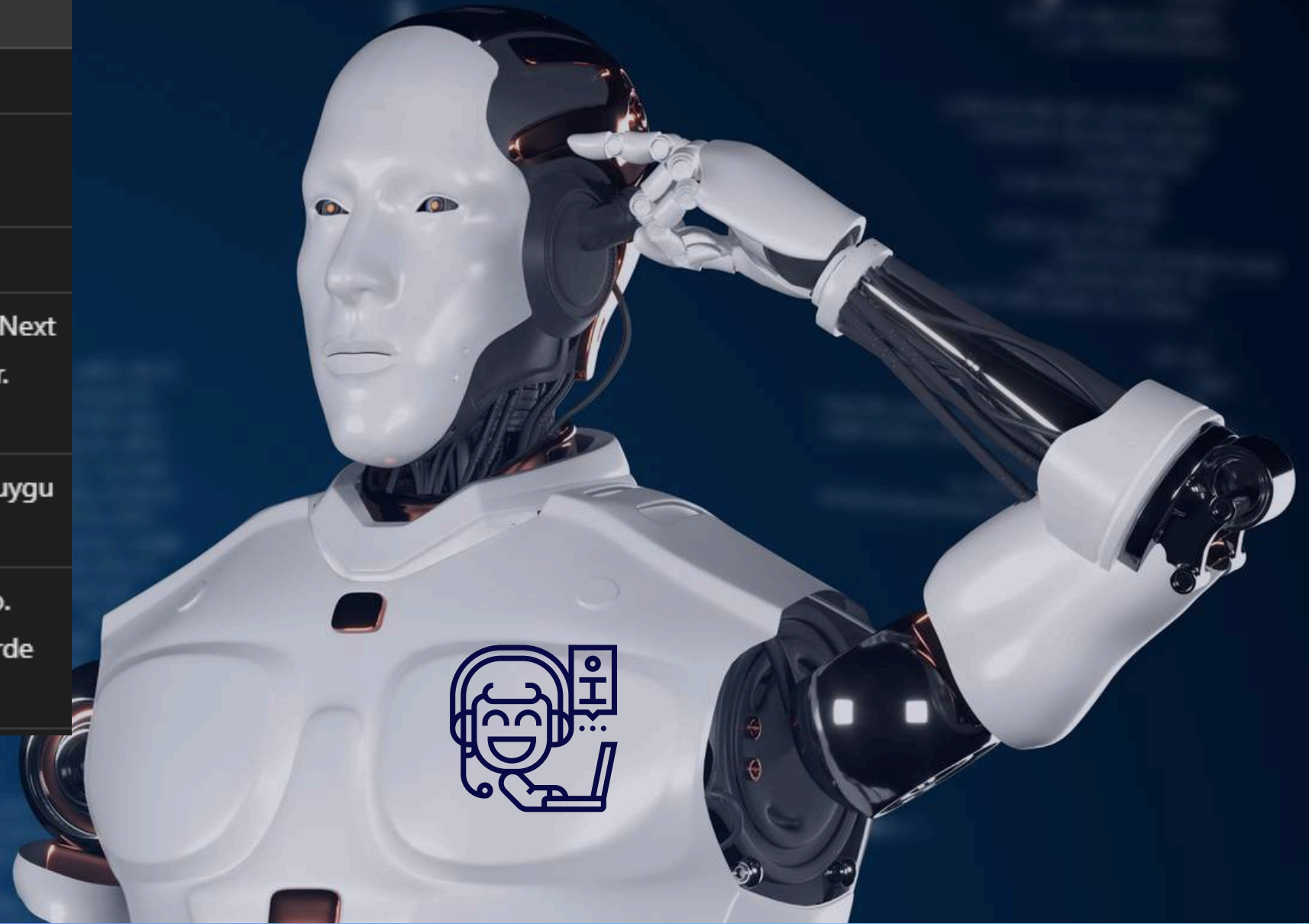
Frekans - Bağlam

- Frekansa bağlı modeller kullanılmamalı.
- Transformers - BERT
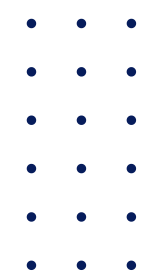
BERT VS spaCy

Transformers Tabanlılar **spaCy hızı** **SpaCy kütüphane** **Etik ve Yasal Çerçevelere Uymak**

- spaCy kolay eğitim süreci.
- BERT "Fine Tuning" spaCy özelleştirmiş pipeline hizmeti.
- Ürün entegresi problemi.
- Türkçe için yapılacak işlemler sınırlı.

Summarization - Mini instruct LLM with Data Analysis

Aynı label'a ait verileri toplamak

Özetlemek

LLM'e yollamak

Neden ?

- LLM token hatasını engellemek.

- Chunk yapısı ile LLM'e kesilmiş token gönderimini engellemek.

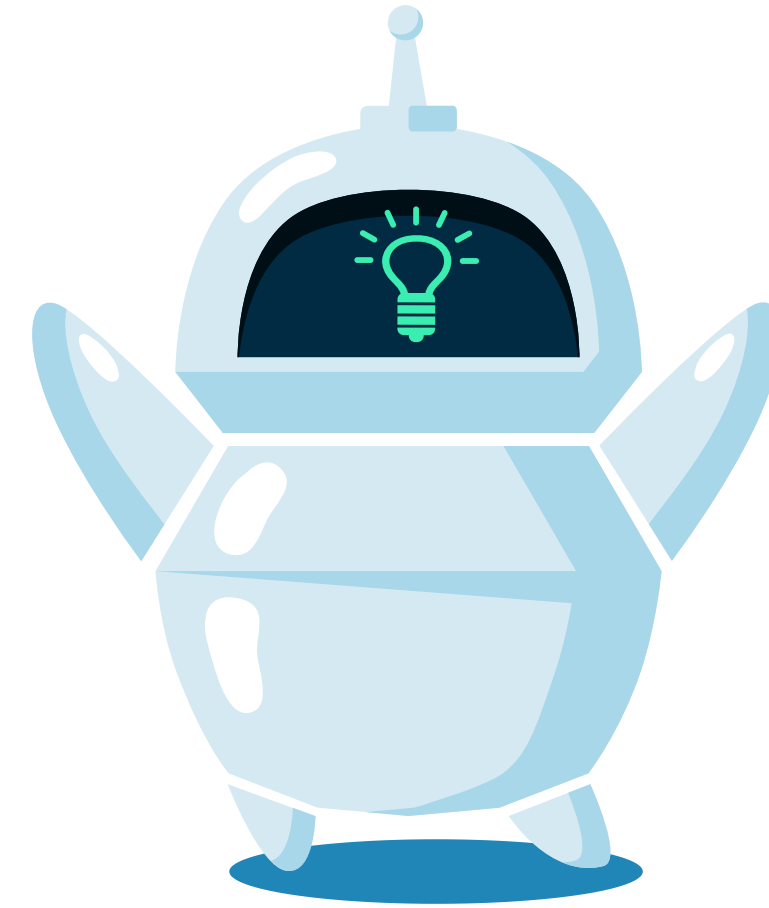- LLM'e en anlamlı promtu yollamak dolayısı ile anlamlı output almak. (for mini llm)
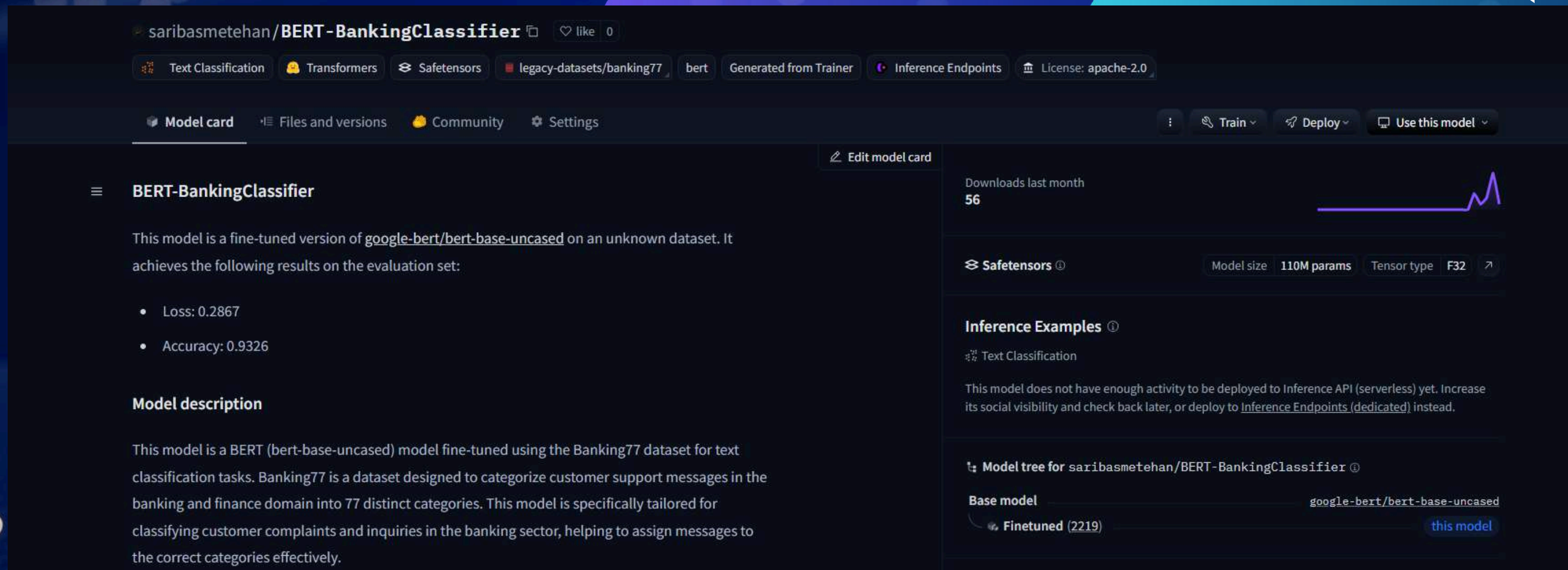
Roadmap

Veriyi sınıflandır

Aynı sınıftaki
veriler ile birlikte özetle

LLM'e yolla

Çözümü al

Sınıflandırma

BERT-BankingClassifier model card (saribasmetehan/BERT-BankingClassifier)

Tags: Text Classification · Transformers · Safetensors · legacy-datasets/banking77 · bert · Generated from Trainer · Inference Endpoints · License: apache-2.0

Model card | Files and versions | Community | Settings

Edit model card

BERT-BankingClassifier

This model is a fine-tuned version of google-bert/bert-base-uncased on an unknown dataset. It achieves the following results on the evaluation set:

- Loss: 0.2867
- Accuracy: 0.9326

Model description

This model is a BERT (bert-base-uncased) model fine-tuned using the Banking77 dataset for text classification tasks. Banking77 is a dataset designed to categorize customer support messages in the banking and finance domain into 77 distinct categories. This model is specifically tailored for classifying customer complaints and inquiries in the banking sector, helping to assign messages to the correct categories effectively.

Downloads last month
56

Safetensors — Model size 110M params — Tensor type F32

Inference Examples
Text Classification

This model does not have enough activity to be deployed to Inference API (serverless) yet. Increase its social visibility and check back later, or deploy to Inference Endpoints (dedicated) instead.

Model tree for saribasmetehan/BERT-BankingClassifier

Base model — google-bert/bert-base-uncased
Finetuned (2219) — this model

```
text_1 = "My money transfer was rejected"
preds = classifier(text_1)
print(preds)
```

```
[{'label': 'LABEL_27', 'score': 0.9552194476127625}]
```

Aynı etiketlerdeki verileri toplayıp özetlemek

```python
from transformers import pipeline
import torch

device = 0 if torch.cuda.is_available() else -1
summarizer = pipeline("summarization", model="philschmid/bart-large-cnn-samsum", device=device)


def summarize_file(file_path):
    with open(file_path, "r", encoding="utf-8") as f:
        text = f.read()

    summary = summarizer(text, max_length=200, min_length=50, length_penalty=2.0, num_beams=4, early_stopping=True)

    return summary[0]['summary_text']


summary_output_file = os.path.join(summary_output_dir, "summarized_data.txt")
with open(summary_output_file, "w", encoding="utf-8") as f:
    for label in label_names:
        raw_file_path = os.path.join(raw_output_dir, f"{label}.txt")
        summary = summarize_file(raw_file_path)
        f.write(f"Label: {label}\n{summary}\n\n")
```
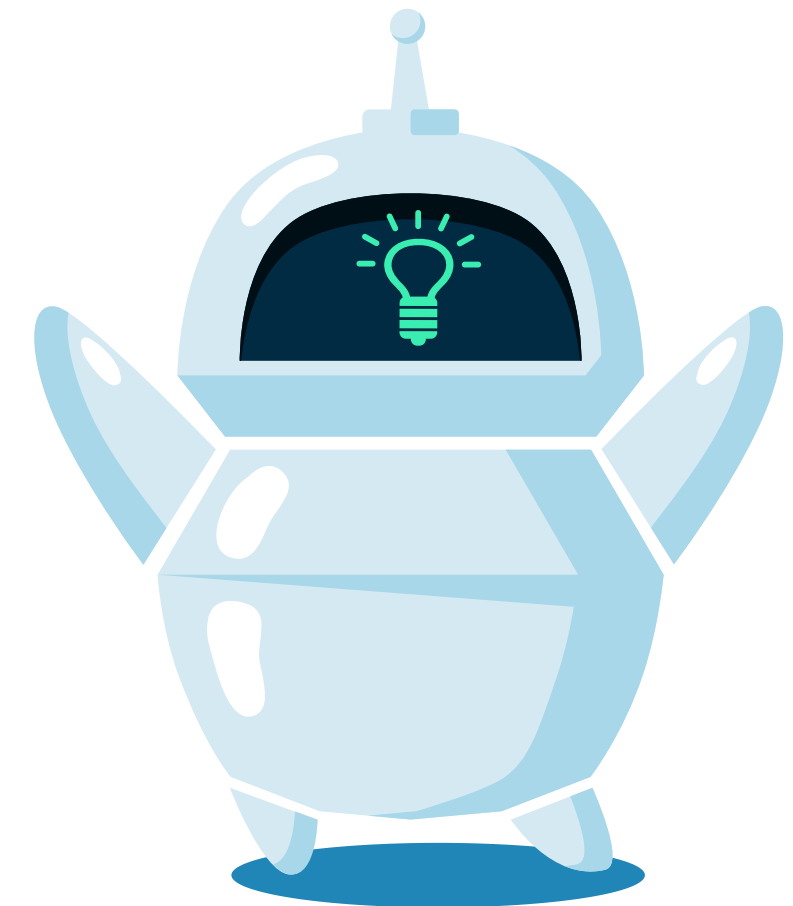
```
Label: card_arrival
I ordered a card a week ago, but I haven't received it yet. It's been two weeks since the delivery. I'm starting to think my
card is lost because it still hasn't arrived. I want to track the card you sent.
```

LLM'e analiz rolü

```python
label_names = dataset["test"].features["label"].names

results = []

for text in texts_to_classify:
    classification_result = classifier(text)[0]
    predicted_label = int(classification_result['label'].split("_")[1])
    label_english = label_names[predicted_label]

    filtered_data = [row["text"] for row in dataset["test"] if row["label"] == predicted_label]
    combined_text = f"{text}\n" + "\n".join(filtered_data)

    summary = summarizer(combined_text, max_length=200, min_length=50, length_penalty=2.0, num_beams=4, early_stopping=True)[0]['summary_text']

    messages = [
        {"role": "system", "content": "You are an analyst who examines customer complaints of a bank. Evaluate the summary of complaints of many customers and provide insights and potential solut
        {"role": "user", "content": f"Here is the summary of complaints related to the label '{label_english}':\n\n{summary}"},
    ]

    generated_text = pipe(messages, **generation_args)[0]["generated_text"]
```

LLM'den çözüm önerisi alma

```
Label: pending_cash_withdrawal
Generated Analysis:
 Based on the summary of complaints related to the 'pending_cash_withdrawal' label, it appears that customers are experiencin
g issues with their cash withdrawals not being processed or posted to their accounts. Here are some insights and potential so
lutions to address these concerns:

1. Investigate the cause of the ATM malfunction: The first step is to identify the reason why the ATM machine did not work pr
operly during the attempted cash withdrawal. This could be due to a technical issue, maintenance, or a problem with the machi
ne itself. The bank should promptly address the issue and ensure that the ATM is functioning correctly to avoid inconvenienci
ng customers.

2. Review the bank's cash withdrawal policies: The bank should review its policies and procedures related to cash withdrawals
to ensure that they are clear and easy to understand for customers. This includes providing information on the expected time
frame for cash withdrawals to be processed and posted to the account.

3. Improve communication with customers: The bank should proactively communicate with customers who have pending cash withdra
wal transactions. This can be done through email, SMS, or phone calls to inform them about the status of their transaction an
d provide an estimated time frame for when the funds will be available in their account.

4. Offer alternative solutions: In cases where the ATM machine is not functioning, the bank should provide alternative soluti
ons for customers to access their funds. This could include providing a temporary card with a limited balance, allowing custo
mers to withdraw cash from another ATM, or offering over-the-counter cash withdrawals at the bank's branches.

5. Monitor and analyze complaints: The bank should continuously monitor and analyze customer complaints related to pending ca
sh withdrawals to identify any recurring issues or trends. This will help the bank to proactively address any problems and im
prove the overall customer experience.

6. Train staff to handle customer complaints: The bank should ensure that its staff is well-trained to handle customer compla
ints related to pending cash withdrawals. This includes providing them with the necessary information and resources to addres
s customer concerns and resolve issues in a timely and efficient manner.

By implementing these solutions, the bank can improve its customer service and address the concerns related to pending cash w
ithdrawals, ultimately
```

Ürün demosu

Data Analysis

Müşteri yorumlarını analiz edin ve çözüm bulun.

When traveling, can I auto top-up my card at certain times?

My cash in the ATM is still pending. I'm waiting

Yeni ekle

Analiz et

automatic_top_up: Based on the summary of complaints related to the 'automatic_top_up' feature, it appears that customers are facing issues with the functionality and accessibility of this feature. Here are some insights and potential solutions: 1. Travel-related concerns: - Customers are seeking the ability to set up automatic top-ups while traveling. - Potential solution: Implement a feature that allows customers to schedule automatic top-ups based on their travel plans. This could be done through the app or by contacting customer support. 2. Limit on automatic top-up: - Customers are unsure about the limits on automatic top-ups. - Potential solution: Clearly communicate the limits on automatic top-ups in the app and on the bank's website. Provide information on how customers can adjust these limits if needed. 3. Difficulty finding the feature in the app: - Customers are having trouble locating the automatic top-up feature in the app. - Potential solution: Improve the app's user interface and navigation to make the automatic top-up feature more accessible. Consider adding a prominent "Auto Top-Up" button or a dedicated section for this feature. 4. Desire for automatic top-up while away: - Customers want to ensure their card is topped up automatically while they are away. - Potential solution: Offer a "Travel Mode" or "Away Mode" feature that automatically tops up the card when the customer is in a specific location or when the card is not used for a certain period. To address these concerns, the bank should consider the following actions: 1. Enhance the app's user interface and navigation to make the automatic top-up feature more accessible. 2. Clearly communicate the limits on automatic top-ups and provide guidance on how to adjust these limits. 3. Implement a feature that allows customers to schedule automatic top-ups based on their travel plans. 4. Introduce a "Travel Mode" or "Away Mode" feature that automatically tops up the card when the customer is away. 5. Provide clear instructions and support for customers who want to set up automatic top-ups. 6. Regularly review and update

pending_cash_withdrawal: Based on the summary of complaints related to the 'pending_cash_withdrawal' label, it appears that customers are experiencing issues with their cash withdrawals not being processed or posted to their accounts. Here are some insights and potential solutions to address these concerns: 1. Investigate the cause of the ATM malfunction: The first step is to identify the reason why the ATM machine did not work properly during the attempted cash withdrawal. This could be due to a technical issue, maintenance, or a problem with the machine itself. The bank should promptly address the issue and ensure that the ATM is functioning correctly to avoid inconveniencing customers. 2. Review the bank's cash withdrawal policies: The bank should review its policies and procedures related to cash withdrawals to ensure that they are clear and easy to understand for customers. This includes providing information on the expected time frame for cash withdrawals to be processed and posted to the account. 3. Improve communication with customers: The bank should proactively communicate with customers who have pending cash withdrawal transactions. This can be done through email, SMS, or phone calls to inform them about the status of their transaction and provide an estimated time frame for when the funds will be available in their account. 4. Offer alternative solutions: In cases where the ATM machine is not functioning, the bank should provide alternative solutions for customers to access their funds. This could include providing a temporary card with a limited balance, allowing customers to withdraw cash from another ATM, or offering over-the-counter cash withdrawals at the bank's branches. 5. Monitor and analyze complaints: The bank should continuously monitor and analyze customer complaints related to pending cash withdrawals to identify any recurring issues or trends. This will help the bank to proactively address any problems and improve the overall customer experience. 6. Train staff to handle customer complaints: The bank should ensure that its staff is well-trained to handle customer complaints related to pending cash withdrawals. This includes providing them with the necessary information and resources to address customer concerns and resolve issues in a timely and efficient manner. By implementing these solutions, the bank can improve its customer service and address the concerns related to pending cash withdrawals, ultimately