

Otel Yorumlarının Sınıflandırılması

Serkan Kızılırmak



CODE
2025

Hızımıza Hız Katıyoruz,
Geleceğe Koşuyoruz

1. Kişisel tanıtım

Eğitim

- **TOBB Ekonomi ve Teknoloji Üniversitesi- İktisat Bölümü (2017- Ağustos 2022)**

Staj Deneyimleri

- **Türkiye Kalkınma ve Yatırım Bankası - Proje Finansmanı Birimi**
- **AFS Boru San. A.Ş. – Finans Birimi**



2. Eğitim öncesi durum özeti

Zaman Serileri (*Enflasyon, Doğrudan Yabancı Yatırımlar vb.*) analizleri



EViews

Panel veri setleri (*Anket, Bilanço vb.*) üzerine
Ekonometrik tabanlı analizler



STATA



3. Problem tanımı ve proje amacı



- Müşterilerin marka hakkında ne düşündüklerini ve onlardan ne beklediklerini takip etmek, prestiji korumak kadar işin büyümesi için de önemlidir. Günümüzde çok uluslu firmaların müşterilerini analiz etmesi zor ve maliyetli bir işlemdir.



- Müşterilerin ürüne yaklaşımların tespit edilmesi
- Müşteri şikayetlerinin değerlendirilmesi
- İşletmenin güçlü ve zayıf yönlerinin belirlenmesi
- Pazarlama stratejindeki boşlukların bulunmasına
- Pazarda rakip firma analizinin kolaylaşması



4. Veri seti üzerine keşfedici çalışmalar (EDA)



Renovation needed and poor customer service

"As a Hilton Diamond member, I booked a (1) night stay at this property in May of 2022. I was disembarking from a river cruise and the hotel is very convenient to the cruise port.

Don't be fooled. This property is desperately in need of renovation. The rooms are outdated. A good way to tell is if there are USB ports for charging devices. No USB charging ports. The hallway carpeting is stained and ripped up. The elevators are dirty. The kicker was the internet for the TV was out. So there was no television and no apology from the front desk when I called to see if it was my television or a full hotel outage. If you are okay with a room that's less than mediocre, this hotel is for you.

The room that was selected for me was on the 5th floor overlooking the train tracks. And I had paid for an upgraded room. This shows that guest services have no consideration for frequent Hilton guests.. I went back down to the front desk and asked for a different room. I was offered a room overlooking the water but the configuration was not the same as what I booked and paid for.

I was offered VIP (skip the line) tickets for the Sky Lounge. Here's the catch. This is not a lounge where you can select your seating/bar seating. They seat you when you arrive in the lounge. And they can seat you wherever they would like.

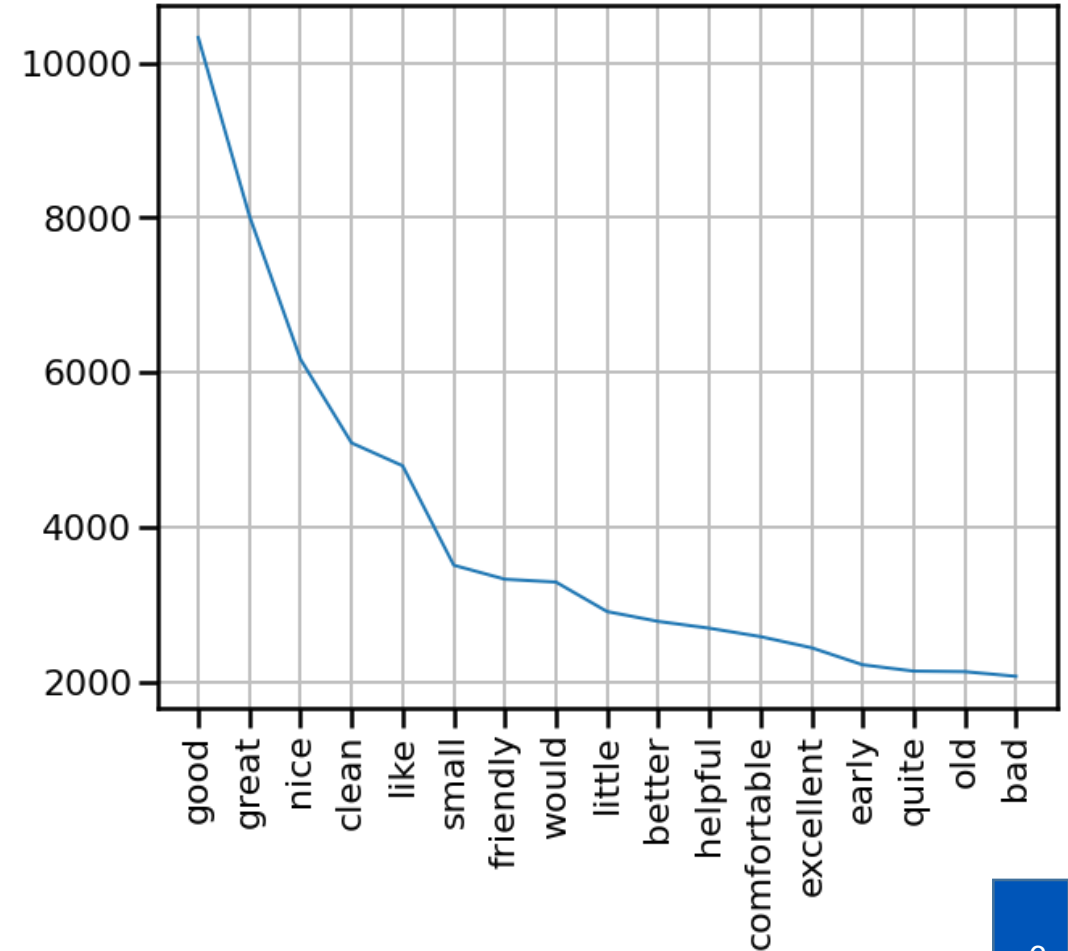
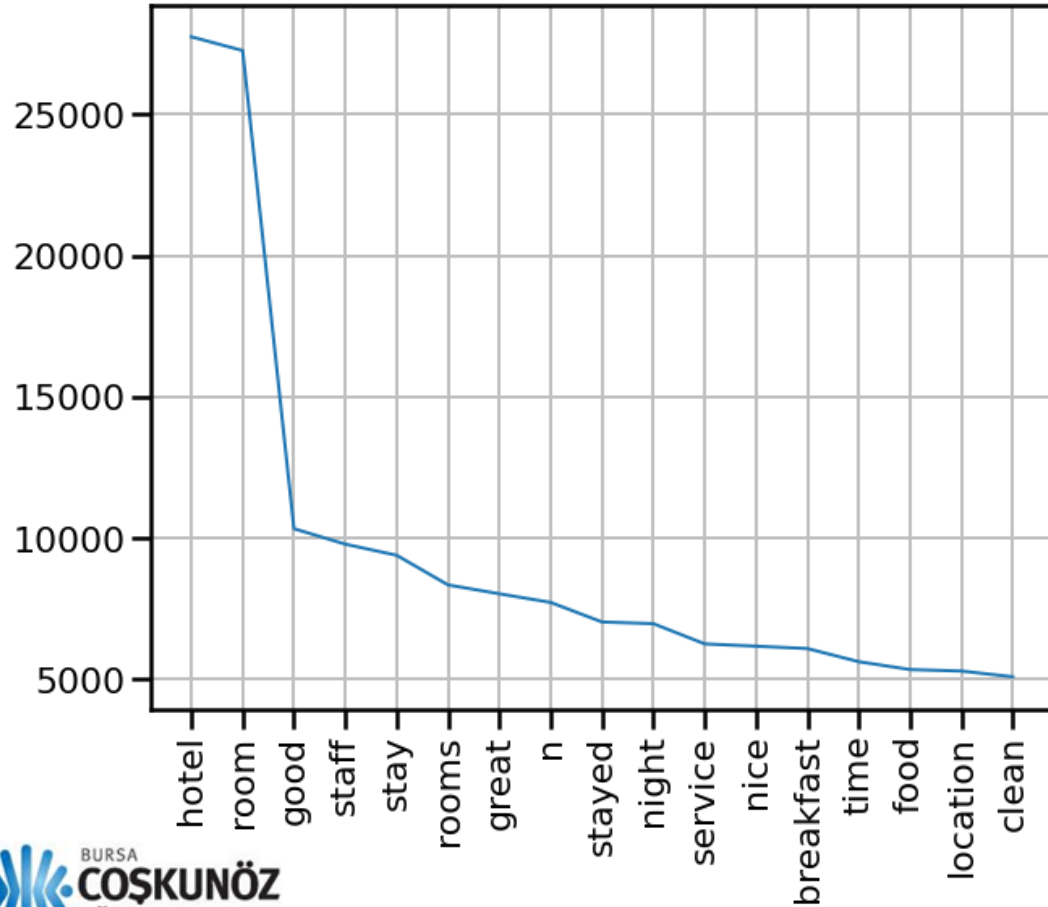
As mentioned, the property is convenient to the cruise port and very convenient to the train station. Yes, it is a 'transient' hotel which is very hard on hotels but customer service is something that every hotel should take note of."

score

review

16511 reviews

4. Veri seti üzerine keşfedici çalışmalar (EDA)



**CODE
2025** Hızımıza Hız Katıyoruz,
Geleceği Koşuyoruz



5. Veri seti üzerinde yapılan ön işlemler

hey hilton, I stayed at the hotel for 15 days, my room was never cleaned



hilton i stayed at the hotel days room was never cleaned

**Etkisiz Kelimelerin Kaldırılması (Stopwords) –
NLTK Kütüphanesi**

Change
Changing
Changes
Changed
Changer

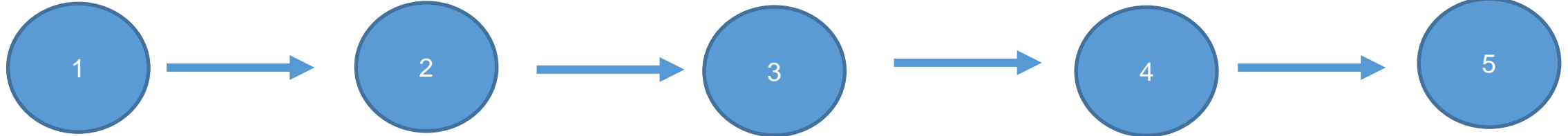
→ Chang

Change

am
is
are

→ be

**STEMMING VS LEMMATIZATION
(SIKLAMA VE KÖK ÇÖZÜMLEME)**



Metinlerin Tokenize Edilmesi

"hilton", "i", "stayed", "at", "the",
"hotel", "day", "room", "was",
"never", "cleaned"

**Metinlerin Vektörize Edilmesi
(TF-IDF)**

-Metin Normalleştirme
-Unicode'ların kaldırılması
-Noktalama İşaretlerinin Kaldırılması

Hey -> hey
@Hilton-> hilton
PLEASE FIX!!! -> please fix

5. Veri seti üzerinde yapılan ön işlemler

4- STEMMİNG VS LEMMATİZATİON (SIKLAMA VE KÖK ÇÖZÜMLEME)

ORIGINAL REVIEW:

i have finally decided not to stay at the london hilton metropole ever again i have been staying there for many years now because of its central location walking distance to oxford regent streets however over the past year the check in service has become surprisingly bizarre i don t think this has anything to do with the on going renovations i am an hiltonhonors card holder gold who consistently books a king deluxe or executive room on three occasions upon check in i was told we are completely booked but we are pleased to upgrade you to a much better room only to open the door and walk into a box with 2 single beds once is an error but three times appears to be a strategy how does a king upgrade to a single bed on each occasion after complaining i was moved

STEMMED REIEW:

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LEMMEED REVIEW:

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5. Veri seti üzerinde yapılan ön işlemler

5- Metinlerin Vektörize Edilmesi (TF-IDF)

Cümle1: hey hilton, I stayed at the hotel for 15 days, my room was never cleaned

Cümle2: the hotel's food was not clean



Cümle1: hilton i stay at the hotel day room be never clean

Cümle2: the hotel food be not clean

Kelime	TF_Cümle1	TF_Cümle2	IDF	TF*IDF_Cümle1	TF*IDF_Cümle2
hilton	1/11	0/6	$\text{Log}(2/1)=0.3$	0.027	0
food	0/11	1/6	$\text{Log}(2/1)=0.3$	0	0.03
hotel	1/11	1/6	$\text{Log}(2/2)=0$	0	0
...

6. Model geliştirme çalışmaları

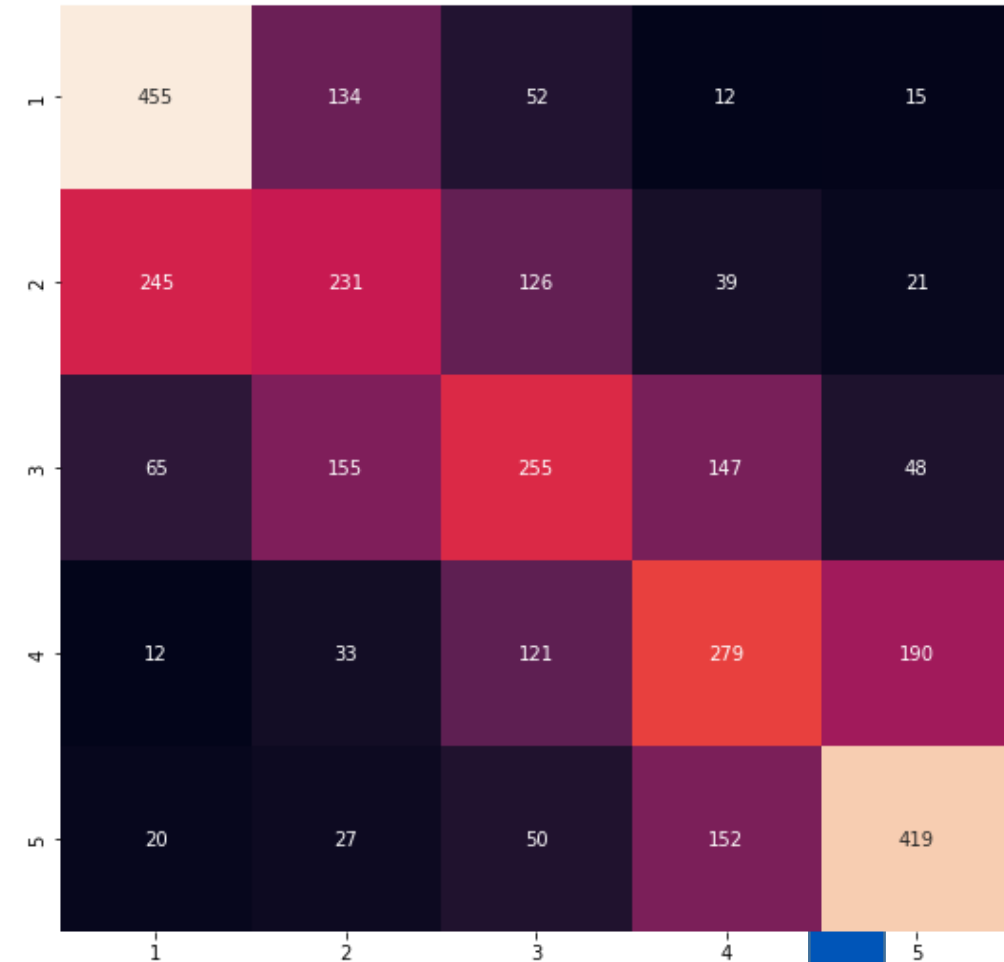
Model Name	Train Accuracy	Validation Accuracy	Test Accuracy
KNeighborsClassifier	0.999899	0.392187	0.496216
Multinomial Naive Bayes	0.515950	0.466687	0.496216
Logistic Regression	0.515950	0.467898	0.496216
SVM	0.869372	0.454573	0.496216
Random Forest	0.751363	0.439431	0.496216
DecisionTreeClassifier	0.585302	0.359176	0.371783

Multinomial Naive Bayes



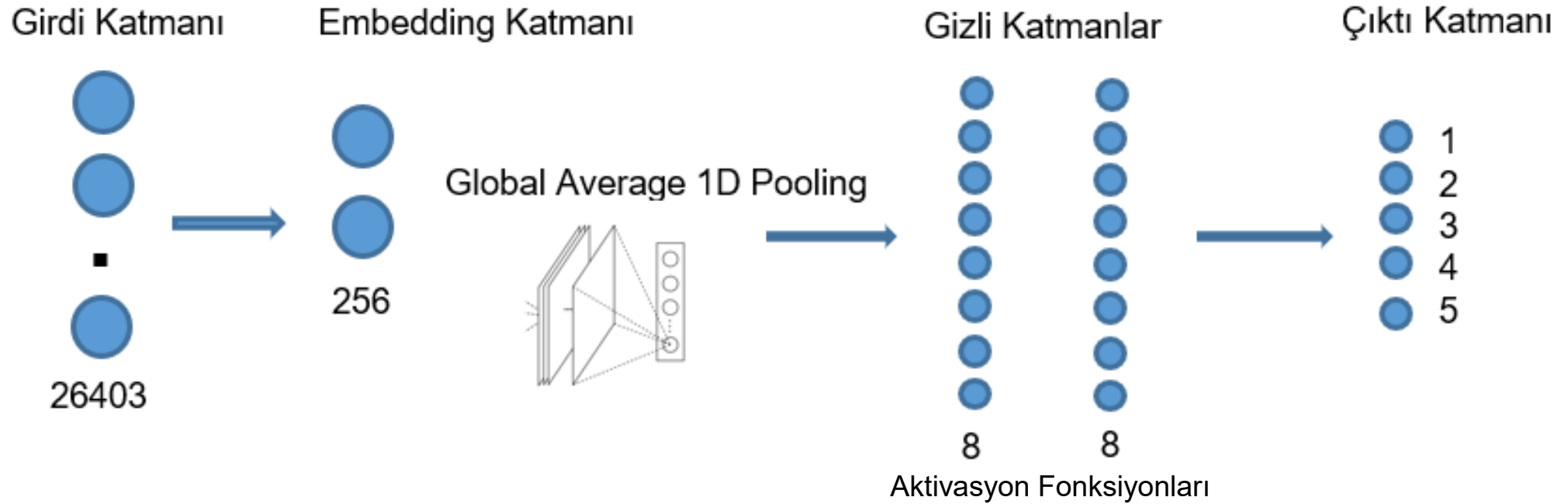
	precision	recall	f1-score	support
1	0.57	0.68	0.62	668
2	0.40	0.35	0.37	662
3	0.42	0.38	0.40	670
4	0.44	0.44	0.44	635
5	0.60	0.63	0.62	668
accuracy			0.50	3303
macro avg	0.49	0.50	0.49	3303
weighted avg	0.49	0.50	0.49	3303

Confusion Matrix of Test Data



6. Model geliştirme çalışmaları

Sinir Ağları Mimarisi



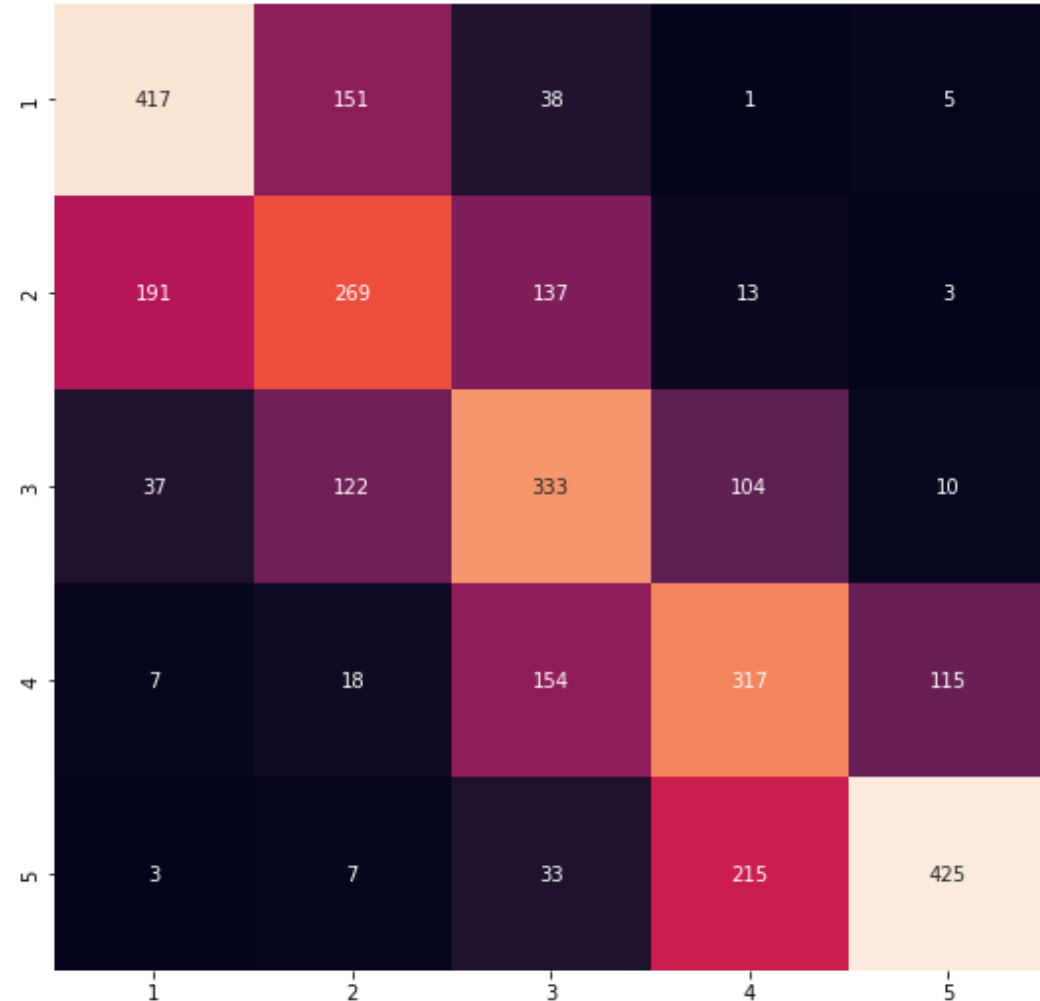
7. Seçilen modelin açıklanması

	precision	recall	f1-score	support
1	0.68	0.64	0.66	655
2	0.44	0.47	0.46	567
3	0.55	0.48	0.51	695
4	0.52	0.49	0.50	650
5	0.62	0.76	0.68	558
accuracy			0.56	3125
macro avg	0.56	0.57	0.56	3125
weighted avg	0.56	0.56	0.56	3125

Validation Accuracy: 0.46 -> 0.53

Test Accuracy: 0.49 -> 0.56

Confusion Matrix of Test Data



8. Katma deęer/fayda



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8. Katma değer/fayda

Otel Yorumları Sınıflandırıcı

Lütfen Yorumunuzu Giriniz (EN)

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Tahminle

Text Padding

	0	1	2	3	4	5	6	7
0	1547	105	168	2212	246	79	403	252

Prediction

2

Prediction Probability

	1
0	0.35651373863220215

	2
0	0.5059220790863037

	3
0	0.11998679488897324

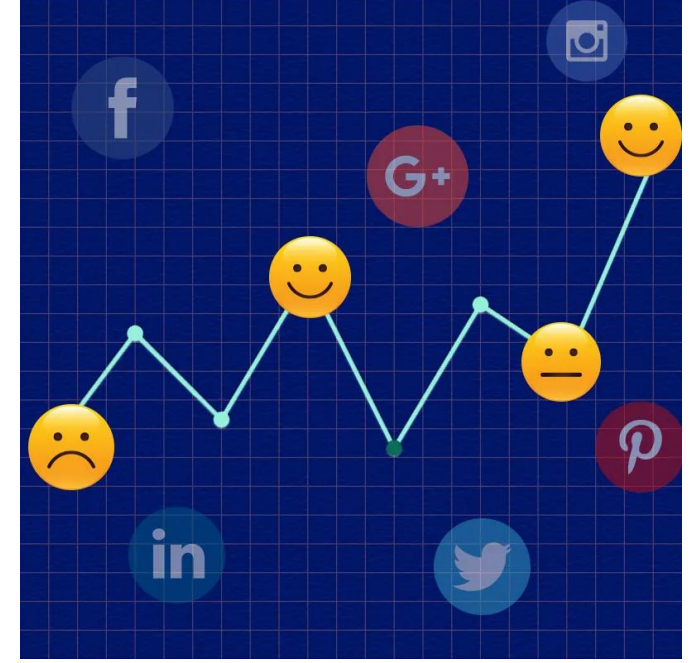
	4
0	0.011983017437160015

	5
0	0.005594415124505758

Streamlit

9. Neler Yapılabilir

- Twitter, Reddit vb. sitelerden veri alınarak daha komplike veri setleriyle çalışılabilir.
- Müşterilerin puanlamaları taraflı (bias) olduğundan dolayı denetimsiz öğrenme modelleri kullanılabilir.
- Metin Özeti ve Anahtar Kelime Teknikleri kullanılarak müşterilerin spesifik bir otel için genel görüşü tespit edilebilir.
- Türkçe olarak ön işleme yapılarak sistem yerelleştirilebilir.



10. Eğitim sonunda durum özeti



11. Referanslar



- Natural Language Processing in Action, Hobson Lane, Cole Howard, Hannes Hapke
Foreword by Dr. Arwen Griffioen
- Deep Learning with Python, François Chollet



Coursera;

- Natural Language Processing Michael Collins, Columbia University
- Introduction to Natural Language Processing, University of Michigan



- twitch.tv/rctatman
- youtube.com/c/JCharisTec;
Emotion In Text Classifier App with Streamlit and Python

12. Soru & Cevap



TEŞEKKÜRLER