

Review Based Analysis of Mobile Phones

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The Department of Computer Science, National University of Computer and Emerging Sciences, accepts this thesis titled *Review Based Analysis of Mobile Phones*, submitted by Asjid Ahmed (p17-6124), and Muhammad Suleman (p17-6147), in its current form, and it is satisfying the dissertation requirements for the award of Bachelors Degree in Computer Science.

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Abstract

Review Based Analysis plays a very important role in mobile selection. Many techniques exist for the analysis of mobile phones. But feature based analysis and fake reviews detection requires understanding the context and the actual meaning of the words. Two reviews, conveying same message, can be written quite differently. The review analysis requires human intelligence and effort. We propose an automatic review analyzer application that analyzes and gives the top suggestions. The system based on the artificial intelligence will verify the reviews and allocate rating accordingly. In the end, the evaluation is done to prove that our approach gives much realistic behavior and can be used by the buyers as well as the sellers.

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Chapter 1

Preliminaries and Introduction

Mobile phones have been one of the most essential components for us during the last decades. The fact about human psychology is that our beliefs are highly motivated and influenced by the thinking and evaluation of other people. When the consumer wants to buy a specific product like a mobile phone. He/She will review a similar product and then he will read reviews. However, the reviews may not always be truthfully provided and fake reviews generally exist. Analyzing these problems and working on different techniques had helped us to develop such a web application that provides sentiment analysis using machine learning algorithms which provide us to help get rid of the problem of selecting a mobile phone.

1.1 Motivation

A web application that provides best mobile phone suggestions based on specific selected features. It will save time by automating analysis of reviews.

1.2 Objective

The objective to develop a platform for selection of mobile phones . In order to achieve that Number of the primary objectives should be fulfilled.

- Polarity of reviews.
- Training model on real data.
- Specific features selection.
- Analysis of the specific features of the mobile phone specifications.
- Analyzing the reviews, based on the Specific features.
- Detection And removal of fake reviews on opinions.

1.3 Scope:

We are providing the way of selecting mobile phones and analysis based on reviews ranking. Our Analysis will be on some selective features.

1.4 Limitations:

- Works only on selective features.
- Computationally expensive.
- Accuracy may vary according to data-set.
- Can't reach human accuracy.

Chapter 2

Review of Literature

2.1 Techniques

Most important thing to choose was the right technique on which we would train our model. After analyzing many literature we came up with following techniques used in review based analysis.

- KNN
- Naive Bayes
- SVM

2.1.1 KNN

KNN[3] is widely used because its simple to understand and easy to implement but as data-set grows the efficiency and speed of model is highly decreased. The features must be homogeneous and it cannot deal with outliers.

2.1.2 Naive Bayes

Naive Bayes is used for Finding the polarity for each review. It works well for high-dimensional data such as text classification. Independent features make Naive Bayes faster. It performs better than other classifiers in terms of accuracy.[4]

2.1.3 SVM(Support Vector Machine)

SVM[2] is mostly used for text classification. In the algorithm, each data will be plotted as a point in n-dimensional space with the value of each feature, n is the number of features.

2.2 Datasets

2.2.1 Online Datasets

- Amazon Date-set was based on star rating rating and reviews. Top 5 brands were compared in this data-set.[1]
- GSMArena
- Twitter This data-set was used for comparing only 5 brands on 4 features i.e battery life, screen quality, operating system and brand.[5]

2.2.2 FAST-NU Dataset

This data-set has multiple sources. It has mobile specifications and reviews of more than 6500+ mobiles of 100+ different brands.

Brands	No. of Mobiles	No. of Reviews
Apple	98	6,000+
Samsung	1,313	70,000+
Oppo	202	14,000+
Huawei	376	26,000+
Infinix	75	5,000+

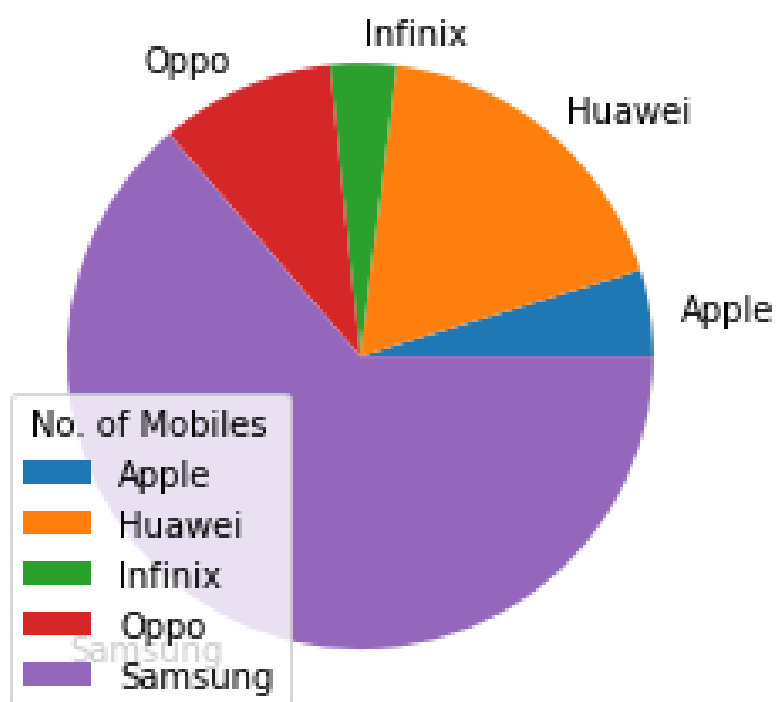


Figure 2.1: Pie Chart

Name	reviewer	review	Date	OS	cpu	Storage	Hits	Screen_size	Screen_res	RAM
Apple iPhone 13 Pro Max	your moder	its has 1tb storage bruh the thing is most people use	:2 hours ago	iOS 15	up	Hexa-core	128GB/256	3 792 981	16.7"	1284x2776
Apple iPhone 13 Pro	John	John 12 Dec 2021Lol stop with the lies!	13-Dec-21	iOS 15	up	Hexa-core	128GB/256	1 533 621	16.1"	1170x2532
Apple iPhone 13	your moder	so SUS Beacuse iphone 13 needs an upgrade man like	2 hours ago	iOS 15	up	Hexa-core	128GB/256	1 847 081	16.1"	1170x2532
Apple iPhone 13 mini	John	Anonymous 07 Dec 2021ok but I wanted to buy a	12-Dec-21	iOS 15	up	Hexa-core	128GB/256	808 297	hi1 5.4"	1080x2340
Apple iPad mini (2021)	Aj	Can somebody help me to buy the better one overall	5 hours ago	iPadOS 15	Hexa-core	64GB/256	472 867	hi1 8.3"		1488x2266
Apple iPad 10.2 (2021)	Anonymous	If you want iPad with powerful performance donâ€™	09-Dec-21	iPadOS 15	Hexa-core	64GB/256	344 187	hi1 10.2"		1620x2160
Apple Watch Edition Series 7	Anonymous	Inst this the aple watch 7?	08-Oct-21	watchOS 8	Dual-core	32GB stora	58 410	hits 1.9"		484x396
Apple Watch Series 7	Anonymous	Very poor battery life. Substandard charger. The fas	#####	watchOS 8	Dual-core	32GB stora	106 039	hi1 1.9"		484x396
Apple Watch Series 7 Aluminum	Anonymous	with this battery life is for junk only	16-Oct-21	watchOS 8	Dual-core	32GB stora	187 498	hi1 1.9"		484x396
Apple iPad Pro 12.9 (2021)	Anonymous	To the Apple please improve ipad os . I know your m	110-Dec-21	iPadOS 14	Octa-core	128GB/256	844 567	hi1 12.9"		2048x2732
Apple iPad Pro 11 (2021)	Anonymous	Anonymous 18 Oct 2021do you want it to have a	#####	iPadOS 14	Octa-core	128GB/256	692 050	hi1 11.0"		1668x2388
Apple iPhone 12 Pro Max	Anonymous	NeoGul 04 Dec 2021Anyone here had they phone st	07-Dec-21	iOS 14.1	u	Hexa-core	128GB/256	11 276 433	6.7"	1284x2776
Apple iPhone 12 Pro	KC2FYA		23 hours ago	iOS 14.1	u	Hexa-core	128GB/256	4 158 611	16.1"	1170x2532
Apple iPhone 12	Anonymous	Anonymous 12 Dec 2021mines at 85% after a year A	6 hours ago	iOS 14.1	u	Hexa-core	64GB/128	5 478 172	16.1"	1170x2532
Apple iPhone 12 mini	Anonymous	tri 29 Nov 2021i just upgrade to 12 mini from 11.. i	08-Dec-21	iOS 14.1	u	Hexa-core	64GB/128	3 843 010	15.4"	1080x2340
Apple iPad Air (2020)	Anonymous	Anonymous 05 Oct 2020just pleeeeee stop crying	13-Dec-21	iPadOS 14	Hexa-core	64GB/256	1 420 752	110.9"		1640x2360
Apple iPad 10.2 (2020)	Lolol	I'm still using it after 12 months and I only charge it	#####	iPadOS 14	Hexa-core	32GB/128	1 079 356	110.2"		1620x2160
Apple Watch SE	Sid	Sid 02 Dec 2021I've been using the SE cellular varian	09-Dec-21	watchOS 7	Dual-core	32GB stora	479 599	hi1 1.78"		448x368
Apple Watch Series 6 Aluminum	EKispert	Anonymous 03 Jun 2021Series 6 watch cost 136 US	1	25-Jul-21	watchOS 7	Dual-core	32GB stora	253 270	hi1 1.78"	448x368
Apple Watch Series 6	anan	can iphone series 6 support to version 6 s plus 12.5.5	25-Oct-21	watchOS 7	Dual-core	32GB stora	419 519	hi1 1.78"		448x368
Apple Watch Edition Series 6	range	Anonymous 05 May 2021The design has become so	#####	watchOS 7	Dual-core	32GB stora	144 015	hi1 1.78"		448x368
Apple iPhone SE (2020)	kaveh	really good phone battery life is ok be consider batter	12-Dec-21	iOS 13	up	Hexa-core	64GB/128	6 864 903	14.7"	750x1334
Apple iPad Pro 12.9 (2020)	Takis	Sheesh 15 Jul 2021A12z is more powerful than a14N	#####	iPadOS 13	Octa-core	128GB/256	1 395 177	112.9"		2048x2732
Apple iPad Pro 11 (2020)	Devonte	Najib1312 23 Jul 2021Guys pls help me choose.	20-Aug-21	iPadOS 13	Octa-core	128GB/256	1 269 773	111.0"		1668x2386
Apple iPhone 11 Pro Max	John	Anonymous 20 Oct 2021I personally thinks itâ€™s th	11-Dec-21	iOS 13	up	Hexa-core	64GB/256	9 853 772	16.5"	1242x2686
Apple iPhone 11 Pro	Anonymous	11pro is the best compact phone till now	#####	iOS 13	up	Hexa-core	64GB/256	6 418 120	15.8"	1125x2436
Apple iPhone 11	ning kni halah angiti	Anonymous 12 Dec 2021I'm on ios 14 & version but	:7 hours ago	iOS 13	up	Hexa-core	64GB/128	10 768 856	1.1"	828x1792

Figure 2.2: Data-set Sample

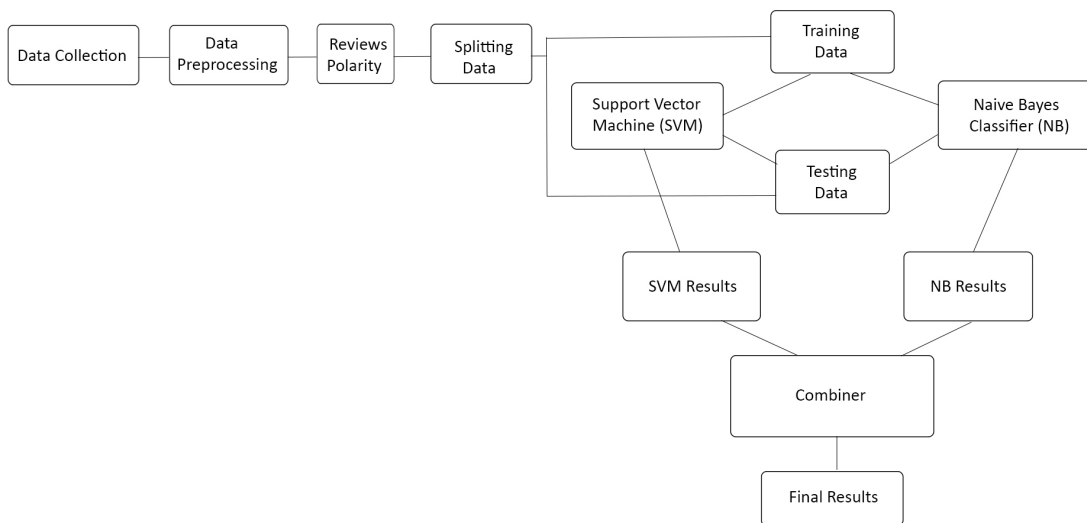
2.3 Conclusion:

We studied several techniques. One good option to use these techniques was to use each technique for whole data but we concluded that by using ensemble learning we can achieve better results by combining results of SVM and Naive Bayes Classifier as there is diversity in data-sets.

Chapter 3

Implementation

3.1 Methodology



Architecture of Review Based Analysis of Mobile Phones

Figure 3.1: Methodology

3.2 Analysis and Design

Use Cases:

1) Register/Login

Name: Register/Login

Goal: User login or user registration.

Actors: User

Pre-conditions: For user login, user must be registered.

Basic Flow: User will register himself and after registration he will login.

Post conditions: After login user will select the features.

2) Provides Requirements

Name: Provides Requirements

Goal: User will provide specific requirements.

Actors: User

Pre-conditions: User will login.

Basic Flow: User will select the features from given list of features.

Post conditions: Selected features will be processed.

3) View Results:

Name: View Results

Goal: User will get results based on his requirements.

Actors:User

Pre-conditions: At least one feature must be selected.

Basic Flow:User will see the top results according to his search.

Post conditions: User will be redirected to feedback.

4) Submit Feedback:

Name: Submit Feedback

Goal: User will submit his experience with system.

Actors:User

Pre-conditions: View Results.

Basic Flow:User will enter his opinion in a text box and submit.

Post conditions: User will be redirected to main page.

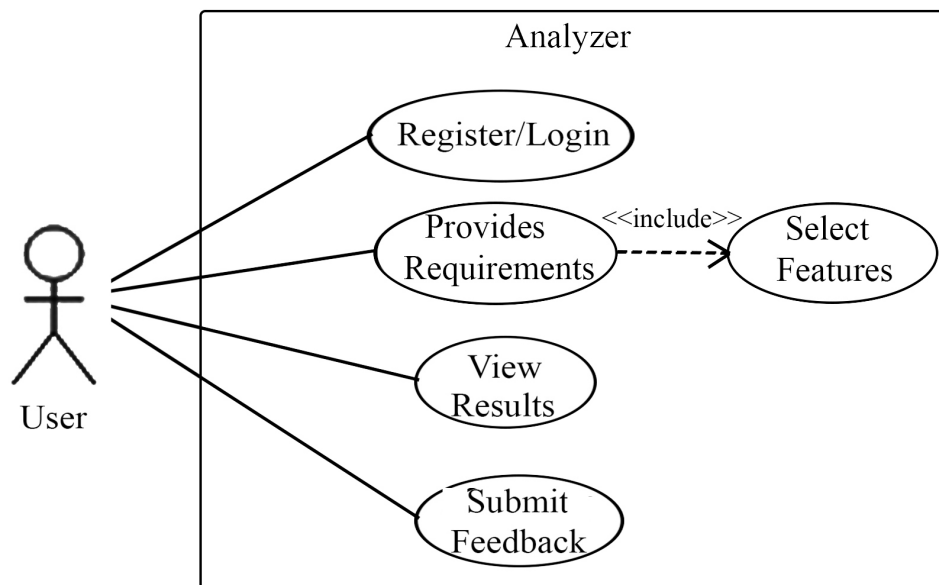


Figure 3.2: Use Case Diagram

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