

# CAL STATE LOS ANGELES

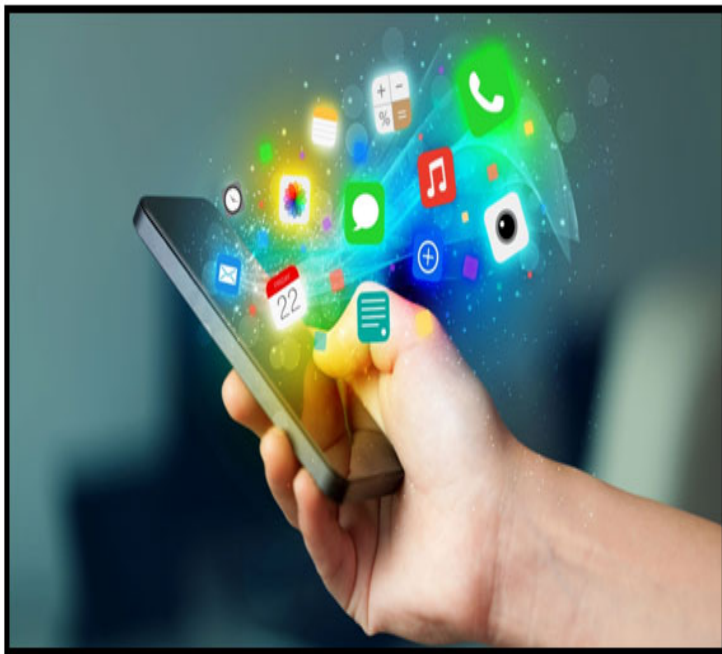
**CS 5250 – 01**

**Submitted to:**

**Dr. Shilpa Balan**

**(FALL-2018)**

**(MOBILE-APP STORE)**



HARSH  
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# MOBILE-APP STORE

## **A. Data set URL:**

The dataset I am using for this project is downloaded from website. The dataset is about Mobile Application App-Store. The dataset contains 3593 Applications with 16 variables. The data is collected from Kaggle Catalog website using CSV File. The data was unclean with lot of missing values as well as duplicates which were cleaned and the final cleaned dataset contains 2685 rows. The 16 variables in the dataset are as follows:

id	Track Name	Size_Bytes	Currency
Price	Rating_Counting_Total	Rating_Counting_Version	User_Rating
User_rating_version	Version	Cont_rating	Prime_Genre
Sup_Devices	Ipadsc_urls_num	Lang.Num	Vpp_Lic

<https://www.kaggle.com/ramamet4/app-store-apple-data-set-10k-apps/home>

<https://www.kaggle.com/gloriousc/ios-app-store/data>

## **B. Data Description:**

Nowadays, the rate of mobile over desktop is increasing. Mobile applications is a software program designed by the software engineers to run on a mobile device, desktop, tablets or smart watch. This distribution platforms began in 2008 are typically operated by the owner of the mobile operating system such as Apple App Store, Google Play, Windows Phone Store, Blackberry App World. There are also pre-installed applications which comes with mobile, for example web browser, app for buying music, calendar, maps and other applications. In the smart mobile some of the applications which are not pre-installed are usually available through other platforms called play stores or app stores. In the comparison Google play is more popular than the App stores.[1] After analysis the dataset, I found that 70% of apps are free and more than 50% of apps have no rating.

To develop software in the mobile landscapes is challenging space to navigate. To develop the mobile applications for mobile devices require considering the limitations and features of the mobile device. Mobile devices have a less powerful processor and run on the battery in contrast desktop are better in performance and memory storage. Right now, Google Play (Android) holds about 53.2% of the smartphone market, while App Store (IOS) is 43%. Some of the mobile application is free and some can be bought. Normally, applications are downloaded from the platform to a mobile device, but occasionally applications can be downloaded in iPad, laptops or Desktops. So, a developer made the application and uploaded to the respective platform, to get more used to download that application, the developer needs to make sure that user can easily find your application. [1]

In this world, there are millions of applications made by the developers, to see which applications now top trending apps in IOS app store by the datasets are which play the key role. The following data sets show more than 7000 Apple IOS mobile application in details. This data was taken out from the (iTunes search API) at the Apple Inc website. First and foremost, to develop the application, it requires the use of specialized integrated development environments. To test the mobile applications first we need to test within the development environment using emulators and later subjected to field testing. To define an emulator, it gives an inexpensive way to test applications on mobile phones by which developer don't have physical access. [2] From using this dataset, I will make visuals to understand more about App Store dataset. As we talk about there are several applications which we are using now. Some are paid, and some are free, the paid one which are more demanding then the free applications. So, from the dataset, first I will use the name of the application and the size bytes column to make it clear outcome that which application is using more memory of the phone. The other visual will be by using the name of the application which are paid, and which are not paid. So, these are the examples of making the visuals so, that if he is not from the computer background can easily understand about the dataset.

APPLE STORE: Apple app store stands for IOS operating system, it was not the first operating system or first app distribution service. It was built on July 2008 and as of Sept 2016, it reported around over 140 billion downloaded the apps from the apple store. From this dataset, we can do visual analytics as of, the name of the application and its sizes and also correlate with the prices or we can also do, and which applications are free, and which are paid. There is also a descriptive part of this dataset is that we can also make visual as the application has the discount or how this application will work on your mobile phone. As of June 2011, there were over 425,000 apps available, and it was over 200 IOS user download the applications. While doing mobile app analytics, we get to understand more about the existing strategy of the

growth and also, we can predict future user. Every distribution platform has their revenue model and strategy against the paid application or In-App Ads. For paid apps, there is a one-time fee to download the application, on the other side user can allow to download the application for free and for the upgrades and premium features users requires to pay the fees. When we talk about In-App ads for the distribution revenue, it allows the ads of different applications within your application, user every time click to an ad in your application, distribution will always earn revenue. [3]

**A. Physical properties of the data:**

Textual	Nominal	Textual	Textual	Textual	Ratio	Ratio	Ratio	Categorical
281796108	Evernote – stay organized	3.99	21292	4	4.5	6.3.5	4+	Games
281940292	WeatherBug - Local Weather, Radar, Maps,	0	16106	4	3.5	8.2.2	4+	Weather
282614216	Alerts	0	18887	4	5	5.0.0	12+	Weather
282935706	eBay: Best App to Buy, Sell, Save! Online	0	29383	5	4.5	5.10.0	4+	Shopping

## B. Data Cleaning

1. **Missing Values:** There were lot of missing values in my data in various columns. I checked this using Excel and applied its filters on every column. I found “Blanks” in those columns and removed those rows.

## Mis\_Filled value

1196	1393	504170504	Louvre HD	125812736	USD	1.99	1129	93	5	5	4.4	4+	Lifestyle	40	4	12	1	
1197	1394	504201783	The Fourth Dimens	9167872	USD	2.99	609	12	4.5	5	1.7	4+	Education	37	5	10	1	
1198	1395	504270602	Ryanaair - Cheapste	116411392	USD	0	175	3	2.5	4.5	3.32	0	4+	Travel	37	0	8	1
1199	1396	504274740	Àâ ÄÅ Æ Ç È É Ê Ë	99992576	USD	0	101	0	4.5	0	7.9	2	4+	Entertainme	37	0	3	1
1200	1397	504280284	Mon compte pour f	19538944	USD	1.99	0	0	0	0	6.3	4+	Utilities	37	1	1	1	
1201	1398	504542019	ÇŦ Ŧ Ŧ Ŧ Ŧ Ŧ Ŧ Ŧ	16457728	USD	0	0	0	0	0	4.1	6	17+	Lifestyle	37	0	1	1
1202	1399	504575083	Tank Hero: Laser W	23957504	USD	0.99	1418	138	4.5	4	1.3	9+	Games	43	5	1	0	
1203	1400	504614735	Ugly Meter PRO, Ni	12806454	USD	4.99	144	36	2.5	1.5	1.2	4+	Entertainme	40	0	1	1	
1204	1401	504631398	USA TODAY	96060416	USD	0	61724	100	3.5	4.5	4.14	1	4+	News	37	4	1	1
1205	1402	504677517	CoPilot GPS Äi Car	82534400	USD	0	3582	70	4	3.5	10.0	0.984	4+	Navigation	38	5	25	1

## Resolved Mis\_filled value

1196	1393	504170504	Louvre HD	125812736	USD	1.99	1129	93	5	5	4.4	4+	Lifestyle	40	4	12	1
1197	1394	504201783	The Fourth Dimens	9167872	USD	2.99	609	12	4.5	5	1.7	4+	Education	37	5	10	1
1198	1395	504270602	Ryanair - Cheapest	116411392	USD	0	175	3	2.5	4.5	3.32.0	4+	Travel	37	0	8	1
1199	1397	504280284	Mon compte pour f	19538944	USD	1.99	0	0	0	0	6.3	4+	Utilities	37	1	1	1
1200	1399	504575083	Tank Hero: Laser W	23957504	USD	0.99	1418	138	4.5	4	1.3	9+	Games	43	5	1	0
1201	1400	504614735	Ugly Meter PRO, N	12806454	USD	4.99	144	36	2.5	1.5	1.2	4+	Entertainme	40	0	1	1
1202	1401	504631398	USA TODAY	96060416	USD	0	61724	100	3.5	4.5	4.14.1	4+	News	37	4	1	1
1203	1402	504677517	CoPilot GPS, Ai Car	82534400	USD	0	3582	70	4	3.5	10.0.0.984	4+	Navigation	38	5	25	1
1204	1403	504835984	Virtual Gastric Ban	689295360	USD	6.99	53	13	4.5	4.5	3.0.2	4+	Health & Fitr	37	5	1	1
1205	1404	505066327	Fake call from the	15771648	USD	0	39	2	2	1	3	4+	Entertainme	37	0	1	1

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- 2. Duplicate values:** There were duplicate values too in my dataset and I removed those using “Remove Duplicates” option in DATA tab in Excel. I found that the Mobile App-Store had 113 redundant values and I removed those using above steps it. After removing those only 2685 unique values are remaining.

### Error Duplicate Value

1194	1389	503190232 Bridge Constructor	145968128 USD	1.99	11187	5	4.5	5	5.9 4+	Games	38	5	13	1
1195	1391	504001448 Muscle Premium -	1101865984 USD	19.99	406	3	4.5	3.5 7.1.02	12+	Medical	37	5	7	1
1196	1393	504170504 Louvre HD	125812736 USD	1.99	1129	93	5	5	4.4 4+	Lifestyle	40	4	12	1
1197	1393	504170504 Louvre HD	125812736 USD	1.99	1129	93	5	5	4.4 4+	Lifestyle	40	4	12	1
1198	1394	504201783 The Fourth Dimens	9167872 USD	2.99	609	12	4.5	5	1.7 4+	Education	37	5	10	1
1199	1395	504270602 Ryanair - Cheapest	116411392 USD	0	175	3	2.5	4.5 3.32.0	4+	Travel	37	0	8	1
1200	1397	504280284 Mon compte pour f	19538944 USD	1.99	0	0	0	0	6.3 4+	Utilities	37	1	1	1
1201	1399	504575083 Tank Hero: Laser W	23957504 USD	0.99	1418	138	4.5	4	1.3 9+	Games	43	5	1	0
1202	1399	504575083 Tank Hero: Laser W	23957504 USD	0.99	1418	138	4.5	4	1.3 9+	Games	43	5	1	0
1203	1400	504614735 Ugly Meter PRO, R	12806454 USD	4.99	144	36	2.5	1.5	1.2 4+	Entertainme	40	0	1	1
1204	1401	504631398 USA TODAY	96060416 USD	0	61724	100	3.5	4.5 4.14.1	4+	News	37	4	1	1
1205	1402	504677517 CoPilot GPS Ài Car	82534400 USD	0	3582	70	4	3.5 10.0.0.984	4+	Navigation	38	5	25	1
1206	1403	504835984 Virtual Gastric Ban	689295360 USD	6.99	53	13	4.5	4.5 3.0.2	4+	Health & Fitr	37	5	1	1

### Resolved Duplicate values

1194	1389	503190232 Bridge Constructor	145968128 USD	1.99	11187	5	4.5	5	5.9 4+	Games	38	5	13	1
1195	1391	504001448 Muscle Premium -	1101865984 USD	19.99	406	3	4.5	3.5 7.1.02	12+	Medical	37	5	7	1
1196	1393	504170504 Louvre HD	125812736 USD	1.99	1129	93	5	5	4.4 4+	Lifestyle	40	4	12	1
1197	1394	504201783 The Fourth Dimens	9167872 USD	2.99	609	12	4.5	5	1.7 4+	Education	37	5	10	1
1198	1395	504270602 Ryanair - Cheapest	116411392 USD	0	175	3	2.5	4.5 3.32.0	4+	Travel	37	0	8	1
1199	1397	504280284 Mon compte pour f	19538944 USD	1.99	0	0	0	0	6.3 4+	Utilities	37	1	1	1
1200	1399	504575083 Tank Hero: Laser W	23957504 USD	0.99	1418	138	4.5	4	1.3 9+	Games	43	5	1	0
1201	1400	504614735 Ugly Meter PRO, R	12806454 USD	4.99	144	36	2.5	1.5	1.2 4+	Entertainme	40	0	1	1
1202	1401	504631398 USA TODAY	96060416 USD	0	61724	100	3.5	4.5 4.14.1	4+	News	37	4	1	1
1203	1402	504677517 CoPilot GPS Ài Car	82534400 USD	0	3582	70	4	3.5 10.0.0.984	4+	Navigation	38	5	25	1
1204	1403	504835984 Virtual Gastric Ban	689295360 USD	6.99	53	13	4.5	4.5 3.0.2	4+	Health & Fitr	37	5	1	1



### 3. Erroneous Values: There were lot of Erroneous values in my data in various columns.

I checked this using Excel and applied its filters on every column. I found ID is in Name\_Track column in those columns and removed those rows.

#### Error Erroneous Value

21	21	285005463	Crash Bandic	10735026	USD	2.99	31456	4178	4	3.5	1.0.0	4+	Games	47	0	1	1
22	22	285946052	70707916	70707916	USD	1.99	2929	966	4.5	4.5	3.3	4+	Reference	43	0	2	1
23	23	285994151	61696001	61696001	USD	2.99	11447	781	5	5	5.2.6	4+	Games	40	5	1	1
24	24	286058814	Yahoo Sports	583552	USD	0	137951	131	4	4.5	6.9	4+	Sports	37	2	6	1
25	25	286070473	Mileage Log	71203840	USD	5.99	8	0	4.5	0	9.0.5	4+	Business	37	5	3	1
26	27	286799607	Clear tune - C	11423008	USD	3.99	3241	297	4	4	2.1.3	4+	Music	43	2	10	1
27	28	286906691	Lifesum - Ai	188017664	USD	0	5795	12	3.5	4	8.4.1	4+	Health & Fitr	37	5	11	1

#### Resolved Erroneous Values

21	285005463	Crash Bandic	10735026	USD	2.99	31456	4178	4	3.5	1.0.0	4+	Games	47	0	1	1
24	286058814	Yahoo Sports	130583552	USD	0	137951	131	4	4.5	6.9	4+	Sports	37	2	6	1
25	286070473	Mileage Log	71203840	USD	5.99	8	0	4.5	0	9.0.5	4+	Business	37	5	3	1
27	286799607	Clear tune - C	11423008	USD	3.99	3241	297	4	4	2.1.3	4+	Music	43	2	10	1
28	286906691	Lifesum - Ai	188017664	USD	0	5795	12	3.5	4	8.4.1	4+	Health & Fitr	37	5	11	1
29	286911400	Hangman.	4765696	USD	0	42316	248	3	3.5	2.0.6	9+	Games	38	0	1	1
31	288113403	iTranslate - I	287933440	USD	0	123215	25	3.5	5	10.5.4	4+	Productivity	37	5	23	1

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4. **Inconsistencies:** There were lot of Inconsistencies values in my data in various columns. I checked this using Excel and applied its filters on every column. I found in the version column the measurement was wrong, it should be 3.4.5 instead of 34.5. So, some of the rows I deleted.

### Error Inconsistencies

1766	557130558	HelloTalk Language Exchange Learning App	167054336	USD	0	1619	50	4	4.5	2.3.4	4+	Education	38
1767	557137623	Angry Birds Star Wars	177338368	USD	0	34138	7	4.5	3.5	1.5.11	4+	Games	37
1768	557138109	Angry Birds Star Wars HD	212249600	USD	0	22674	10	4.5	4.5	1.5.11	4+	Games	24
1769	557153158	Shpock Boot Sale & Classifieds App. Buy & Sell	82904064	USD	0	212	1	4	5	3.12.2	12+	Shopping	37
1770	557285579	Total - Free browser with file manager and cloud stor	75883520	USD	0	4231	288	4.5	4	2.6.4	17+	Entertainment	38
1771	557405467	Network Analyzer - wifi scanner, speed test, tools	12513280	USD	3.99	2840	258	4.5	5	7.2	4+	Utilities	37
1772	557932128	Inkly: Greeting Cards, Postcards, Flowers & Gifts	139865088	USD	0	1034	859	4.5	5	7.5.1	9+	Shopping	37
1773	558094294	Dashy Crashy	166305792	USD	0	3979	374	4.5	4.5	2.0.1	4+	Games	37
1774	558202790	CUBE SNAP	85362688	USD	0.99	1133	142	4.5	4.5	3.14	4+	Games	37
1775	558270538	File Manager Pro App	14442496	USD	4.99	2154	27	4.5	4	2.5	17+	Business	37

### Resolved Inconsistencies

1765	557121061	MetaMoli Note - note taking and PDF annotation app	103659520	USD	7.99	493	2	4	4.5	3.9.3	4+	Productivity	38
1766	557130558	HelloTalk Language Exchange Learning App	167054336	USD	0	1619	50	4	4.5	2.3.4	4+	Education	38
1767	557137623	Angry Birds Star Wars	177338368	USD	0	34138	7	4.5	3.5	1.5.11	4+	Games	37
1768	557138109	Angry Birds Star Wars HD	212249600	USD	0	22674	10	4.5	4.5	1.5.11	4+	Games	24
1773	558094294	Dashy Crashy	166305792	USD	0	3979	374	4.5	4.5	2.0.1	4+	Games	37
1777	558512661	InsTrack for Instagram - Analytics Plus More	14225408	USD	0	85535	1897	4.5	4.5	2.3.4	4+	Social Networking	37
1778	558818638	Weblock - Adblock for apps and websites	37883904	USD	1.99	1880	118	3.5	3.5	4.4.1	4+	Utilities	37

## 5. Out of Date:

In my data there is no columns of date...

6. **Leading or trailing issues** There were lot of leading and trailing issues in my data in various columns. I checked this using Excel and applied its filters on every column.

### Error

102	307219387	Brain Wave, iAc - 32 Advanced Binaural Brainwave Entrainment Programs	90828800	USD	4.99	2913	357	4	5	7.4	4+	Health & Fitr	43	5	1	1
103	307354030	iSwap Faces LITE	30796800	USD	0	39722	0	3	0	5.1	4+	Photo & Vide	37	5	1	1
104	307386350	DIRECTV	151397376	USD	0	81006	25	3.5	3	4.9.705	4+	Entertainme	37	0	1	1
105	307569751	NYTimes Crossword - Daily Word Puzzle Game	46880768	USD	0	53465	204	3.5	4	2.8.1	4+	Games	37	5	1	1
106	307727765	Doodle Jump	48741376	USD	0.99	395261	88	4.5	4.5	3.17.6	4+	Games	37	0	1	1
107	307741537	LEDit, Ai The LED Banner App	17145856	USD	1.99	2021	147	4.5	4.5	3.5.1	4+	Utilities	37	4	12	1
108	307764057	niconico	25808896	USD	0	182	0	3	0	6.52	17+	Entertainme	37	5	3	1
109	307906541	Fandango Movies - Times + Tickets	81924096	USD	0	291787	589	4	5	8.6	4+	Entertainme	37	4	1	1
110	308111628	iCab Mobile (Web Browser)	19451904	USD	1.99	2441	4	4	5	9.9	17+	Utilities	38	4	12	1
111	308339980	iRagdoll - Ragdoll Physics	118683648	USD	0.99	1372	25	4	4	1.8.3	12+	Games	37	2	1	1

### Correction

101	307184892	CBS Sports App - Sports Scores, News, Stats, Watch	120357888	USD	0	59639	11	3	2.5	10.2.2	17+	Sports	37	4	1	1
102	307219387	Brain Wave, iAc - 32 Advanced Binaural Brainwave Entrainment Programs	90828800	USD	4.99	2913	357	4	5	7.4	4+	Health & Fitr	43	5	1	1
103	307354030	iSwap Faces LITE	30796800	USD	0	39722	0	3	0	5.1	4+	Photo & Vide	37	5	1	1
104	307386350	DIRECTV	151397376	USD	0	81006	25	3.5	3	4.9.705	4+	Entertainme	37	0	1	1
105	307569751	NYTimes Crossword - Daily Word Puzzle Game	46880768	USD	0	53465	204	3.5	4	2.8.1	4+	Games	37	5	1	1
106	307727765	Doodle Jump	48741376	USD	0.99	395261	88	4.5	4.5	3.17.6	4+	Games	37	0	1	1
107	307741537	LEDit, Ai The LED Banner App	17145856	USD	1.99	2021	147	4.5	4.5	3.5.1	4+	Utilities	37	4	12	1
108	307764057	niconico	25808896	USD	0	182	0	3	0	6.52	17+	Entertainme	37	5	3	1
109	307906541	Fandango Movies - Times + Tickets	81924096	USD	0	291787	589	4	5	8.6	4+	Entertainme	37	4	1	1
110	308111628	iCab Mobile (Web Browser)	19451904	USD	1.99	2441	4	4	5	9.9	17+	Utilities	38	4	12	1
111	308339980	iRagdoll - Ragdoll Physics	118683648	USD	0.99	1372	25	4	4	1.8.3	12+	Games	37	2	1	1
112	308368164	Proloquo2Go - Symbol-based AAC	723764224	USD	249.99	773	10	4	3.5	5.0.1	4+	Education	37	5	3	1
113	308750436	Dictionary.com Dictionary & Thesaurus	111275008	USD	0	200047	177	4	4	7.1.3	4+	Reference	37	0	1	1

### 7. Date format

In my data there is no columns of date...

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8. **Other data types** There were lot of irrelevant values in my data in various columns. I checked this using Excel and applied its filters on every column. I found “other data” in those columns and removed those rows.

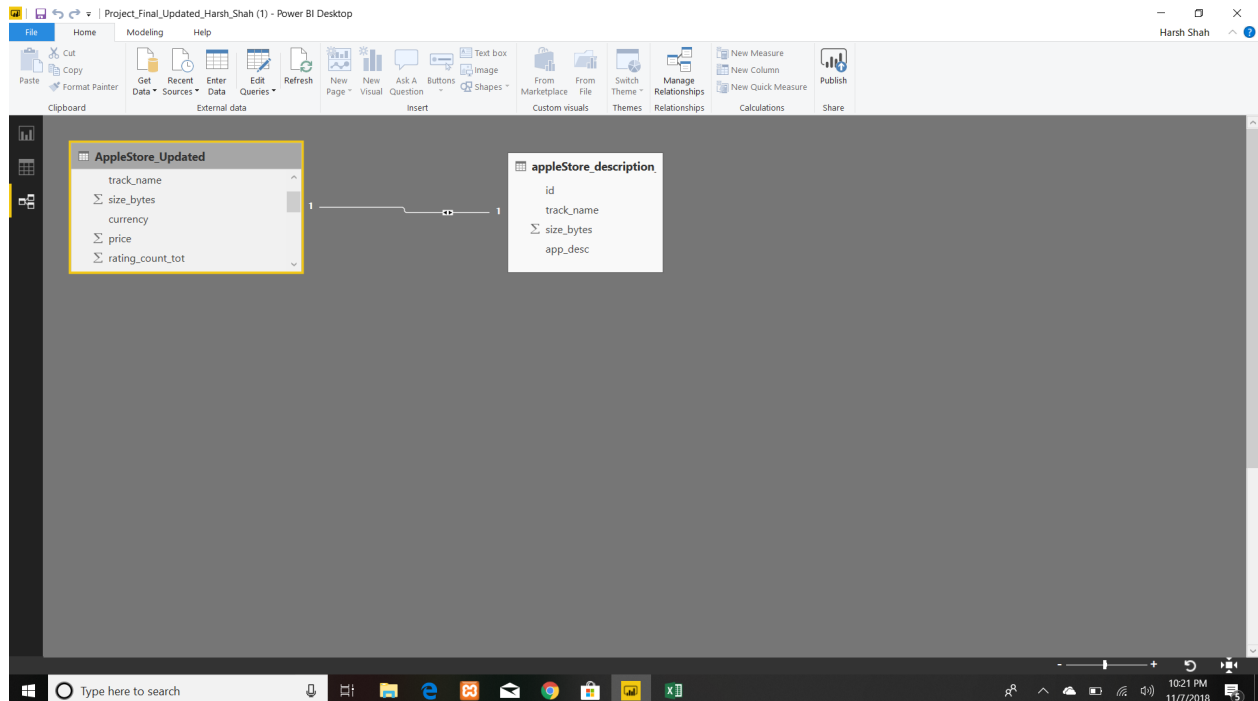
## Error

1196	1393	504170504	Louvre HD	125812736	USD	1.99	1129	93	5	5	4.4	4+	Lifestyle	40	4	12	1	
1197	1394	504201783	The Fourth Dimens	9167872	USD	2.99	609	12	4.5	5	1.7	4+	Education	37	5	10	1	
1198	1395	504270602	Ryainair - Cheapest	116411392	USD	0	175	3	2.5	4.5	3.32	0	4+	Travel	37	0	8	1
1199	1396	504274740	Àâ Ä Å Æ Ą Ć Ĉ Ċ Ď Ę Ė Ě	99992576	USD	0	101	0	4.5	0	7.92	4+	Entertainment	37	0	3	1	
1200	1397	504280284	Mon compte pour l	19538944	USD	1.99	0	0	0	0	6.3	4+	Utilities	37	1	1	1	
1201	1398	504542019	ÇŦ Ė Ę Ė Ě	16457728	USD	0	0	0	0	0	4.16	17+	Lifestyle	37	0	1	1	
1202	1399	504575083	Tank Hero: Laser W	23957504	USD	0.99	1418	138	4.5	4	1.3	9+	Games	43	5	1	0	
1203	1400	504614735	Ugly Meter PRO, N	12806454	USD	4.99	144	36	2.5	1.5	1.2	4+	Entertainment	40	0	1	1	
1204	1401	504631398	USA TODAY	96060416	USD	0	61724	100	3.5	4.5	4.14	1	News	37	4	1	1	
1205	1402	504677517	CoPilot GPS Āi Car	82534400	USD	0	3582	70	4	3.5	10.0	0.984	4+	Navigation	38	5	25	1

## Correction

1196	1393	504170504 Louvre HD	125812736 USD	1.99	1129	93	5	5	4.4 4+	Lifestyle	40	4	12	1
1197	1394	504201783 The Fourth Dimens	9167872 USD	2.99	609	12	4.5	5	1.7 4+	Education	37	5	10	1
1198	1395	504270602 Ryanair - Cheapest	116411392 USD	0	175	3	2.5	4.5 3.32.0	4+	Travel	37	0	8	1
1199	1397	504280284 Mon compte pour f	19538944 USD	1.99	0	0	0	0	6.3 4+	Utilities	37	1	1	1
1200	1399	504575083 Tank Hero: Laser W	23957504 USD	0.99	1418	138	4.5	4	1.3 9+	Games	43	5	1	0
1201	1400	504614735 Ugly Meter PRO, N	12806454 USD	4.99	144	36	2.5	1.5	1.2 4+	Entertainme	40	0	1	1
1202	1401	504631398 USA TODAY	96060416 USD	0	61724	100	3.5	4.5 4.14.1	4+	News	37	4	1	1
1203	1402	504677517 CoPilot GPS, Ai Car	82534400 USD	0	3582	70	4	3.5 10.0.0.984	4+	Navigation	38	5	25	1
1204	1403	504835984 Virtual Gastric Ban	68929360 USD	6.99	53	13	4.5	4.5 3.0.2	4+	Health & Fitt	37	5	1	1
1205	1404	505066327 Fake call from the	15771648 USD	0	39	2	2	1	3 4+	Entertainme	37	0	1	1

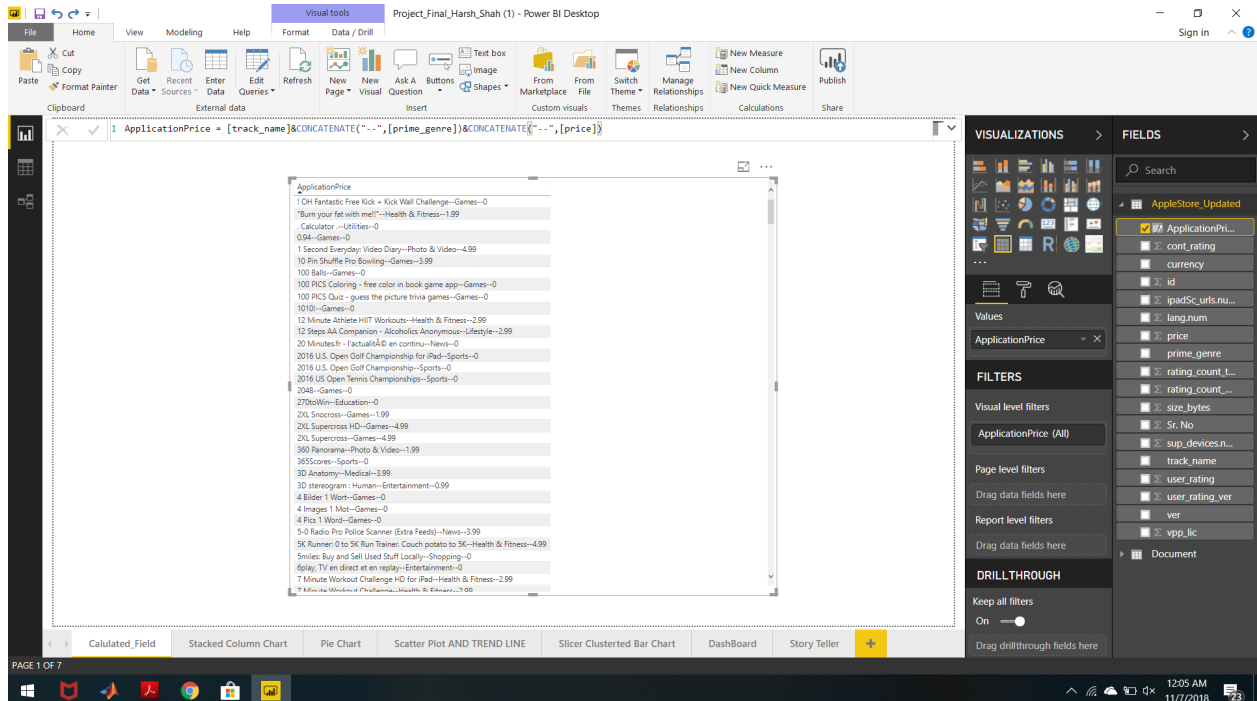
## **E. RELATIONSHIPS TABLE:**



### **Relationship between the two tables.**

In this relationship between the two data is first data is the main dataset and second is the weblink contains data. So, it is one to one relationship, it is one field is related to one field of another data. In my dataset there is one to one relationship is the id name and the size\_bytes column by which we can denote some unique values.

## F. CALCULATED FIELD:



## FORMULA:

- `ApplicationPrice = [track_name] & CONCATENATE("--",[prime_genre]) & CONCATENATE ("--",[price])`

In this chart, I made the calculation field, as in my dataset there is no values which I can calculate. So, I merge the three columns by using CONCATENATE key-word. I merge three columns and the action comes after is the application name, which application comes in which category and the price of the application. After the merging the columns, I used ("--") in between the columns which sperates the columns and we get the good table.

## **References**

- [1] [https://en.wikipedia.org/wiki/Mobile\\_app](https://en.wikipedia.org/wiki/Mobile_app)
- [2] Siegler, MG (June 11, 2008). **"Analyst: There's a great future in iPhone apps"**. *Venture Beat*.
- [3] <https://conversionxl.com/blog/mobile-app-analytics/>
- [4] <https://www.kaggle.com/ramamet4/app-store-apple-data-set-10k-apps/home>