Mobile Price Range Prediction

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Capstone RECAP

- Use *Mobile Price Classification* dataset to build models to predict the price range indicating how high the price is of mobile phone base on mobile specifications

- Data : Mobile Price Classification

Capstone RECAP

- Mobile phone price change depending on the specifications of the phone, but there are many special examples. Some phones' specifications not as good as other phones, but the price is not lower than other phones.
- Random access memory in megabytes and battery power have a greater impact on the price.

Capstone RECAP

- Models:

Nature of the Problem: Multiclass classification problem

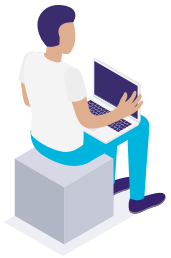
Logistic Regression : Accuracy for the training set is 86.75%, for the test set is 83.25%

Neural Network: Accuracy for the training set is 100%, for the test set is 92%

Random Forest: Accuracy for the training set is 98.75%, for the test set is 86.75%

Work Extension

- A problem is that the price data we obtained is not a definite value range.
- This makes our data and results less usable.
- Because over time, the price of mobile phones is changing. Even with the same configuration, the price in 2010 and the price in 2020 will be very different.
- I proposed a method to simulate a specific price range.



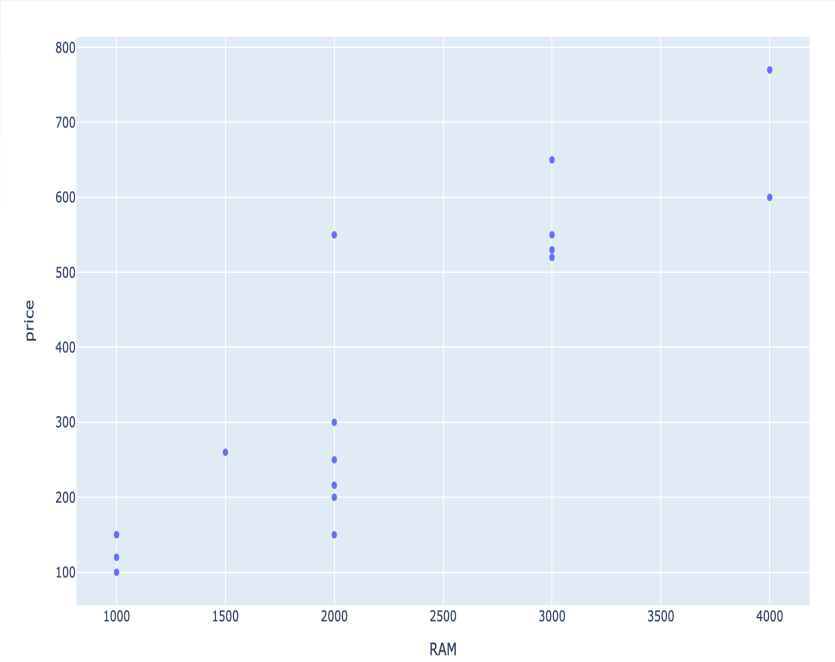
Obtain Price Data

- Source: Wikipedia
- Randomly select 16 phones for the list and google the release price of that year and the RAM(in megabytes).
- I retrieved the Data of the Year 2015 and 2016

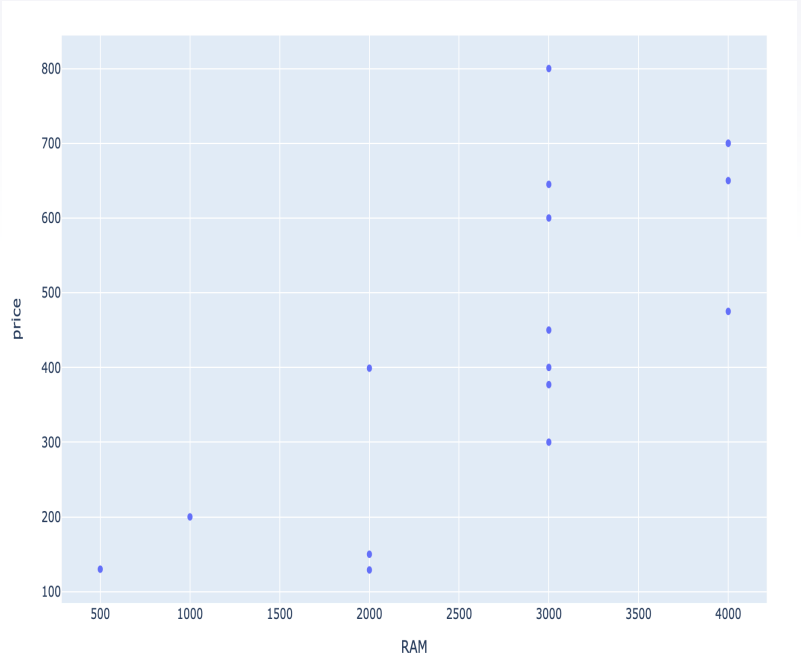
	Name	RAM	price
0	Acer Liquid Z630	2000	216
1	Alcatel One Touch Idol 3	2000	250
2	Droid Turbo 2	3000	520
3	Honor 5X	2000	200
4	HTC Butterfly 3	3000	530
5	iPhone 6S	2000	550
6	Lava Pixel V1	2000	150
7	Lenovo A6000	1000	150
8	LG G4	3000	550
9	Microsoft Lumia 430	1000	120

	Name	RAM	price
0	Alcatel Idol 4	3000	377
1	BlackBerry DTEK50	3000	300
2	Cat S60	3000	600
3	HP Elite x3	4000	700
4	iPhone SE	2000	399
5	Pixel	4000	650
6	Samsung Galaxy A8	3000	800
7	Sony Xperia X	3000	645
8	LG G5	4000	700
9	Redmi 3	2000	150

Scatter Plot the Data

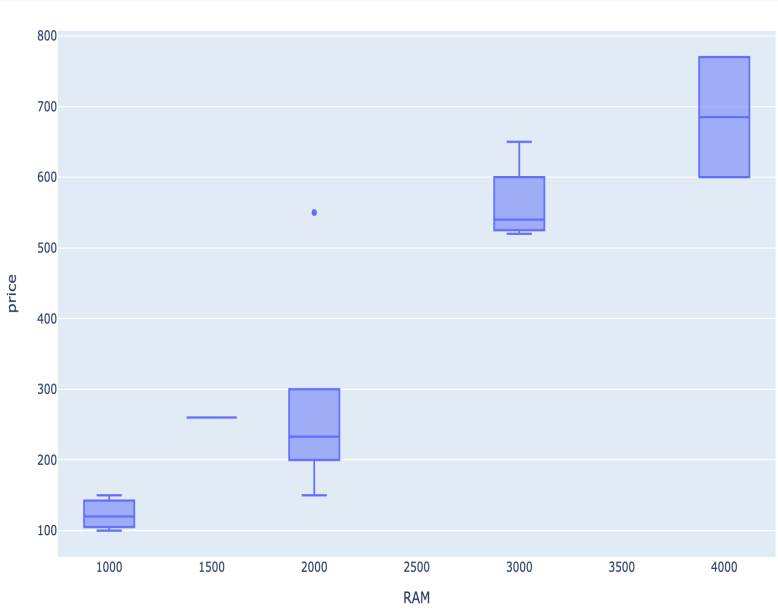


2015

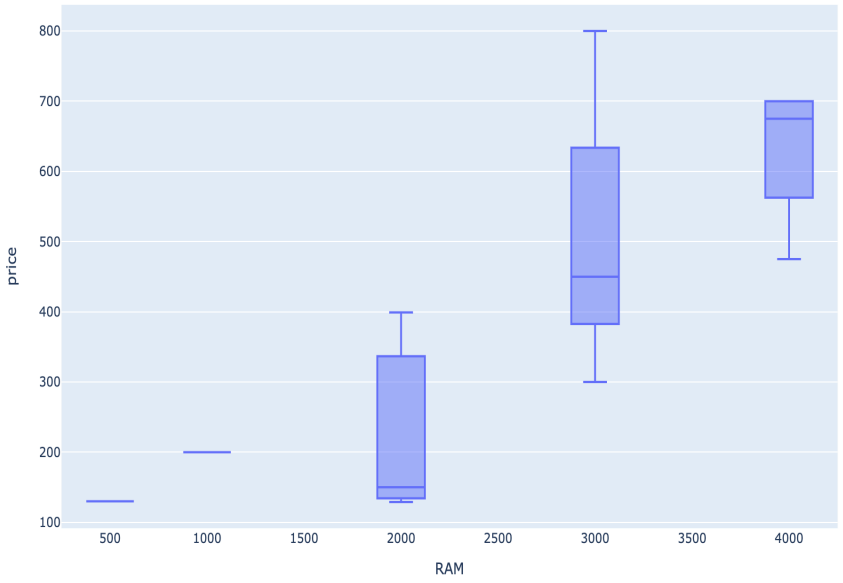


2016

Box plot the Data



2015



2016

Simulation

- Based on the Box Plot, people can easily separate four price ranges.
- We also can use first quartile(Q1) and third quartile(Q3) to decide the demarcation point.

Price Tag	2015	2016
Low	<200	<200
Median	200 ~ 500	200 ~ 350
High	500 ~ 600	350 ~ 600
Very High	600<	600<

Other Finding

- Price can also be affected by Brand and Country.
- For example:

  Freedom 251 sale in India

Price: ₹251 (the equivalent of $3.54 as of 2020)

Compatible networks	2.5G, 3G, HSUPA
First released	February 18, 2016; 4 years ago
Availability by region	India
Type	Smartphone
Form factor	Slate
Mass	130 g
Operating system	Android 5.1 Lollipop
CPU	1.3 GHz Quad-Core Processor
Memory	1 GB RAM
Storage	8 GB
Removable storage	Up to 32 GB MicroSD
Battery	1450 mAh Lithium-ion battery
Data inputs	Touchscreen, Accelerometer, Magnetometer, Proximity sensor, Ambient light sensor
Display	102 mm (4.0 in) qHD IPS Display (960x540 pixels)
Rear camera	3.2 megapixel
Front camera	0.3 megapixel
Connectivity	Wi-Fi, Bluetooth 3.0, USB 2.0, DLNA, UMA
Other	Wi-Fi Hot Spot, FM radio

V.S.

Display 4.30-inch (720x1280)	Processor Qualcomm Snapdragon S4	Front Camera 2MP
Rear Camera 8MP	RAM 2GB	Storage 16GB
Battery Capacity 2000mAh	OS Android 4.1	

Display 4.00-inch (640x1136)	Processor Apple A6	Front Camera 1.2MP
Rear Camera 8MP	RAM 1GB	Storage 16GB
Battery Capacity 1440mAh	OS iOS 6.1.4	

Xiaomi Mi 2
$300

iPhone 5
$650

Future Work

Use Web scraping technique to obtain the data with other important features, like brand, country, new design to make my models more accuracy under actual conditions

THANKS!

Any questions?

You can find me at:

- siyuw1@umbc.edu
- https://github.com/ciciwang1/DATA606

Credits

- Presentation template by Slide Carnival
- Dataset by Abhishek Sharma