

In [62]:

```
import numpy as np
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt
```

In [63]:

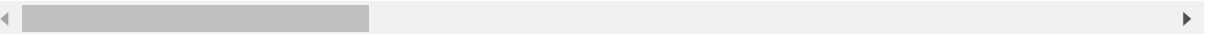
```
data = pd.read_csv("flipkart_smartphones.csv")
```

In [64]:

```
data.head()
```

Out[64]:

	title	ram	brand	url	product_id	
0	POCO C31 (Royal Blue, 64 GB)	4 GB RAM	POCO	https://www.flipkart.com/poco-c31-royal-blue-6...	MOBG73E7GKQK4KZP	LSTM
1	POCO C31 (Shadow Gray, 64 GB)	4 GB RAM	POCO	https://www.flipkart.com/poco-c31-shadow-gray-...	MOBG73E7UBFXXMCH	LSTM
2	realme C35 (Glowing Green, 64 GB)	4 GB RAM	realme	https://www.flipkart.com/realme-c35-glowing-gr...	MOGBTHFSKHF8RAU	LSTM
3	OPPO K10 (Black Carbon, 128 GB)	6 GB RAM	OPPO	https://www.flipkart.com/oppo-k10-black-carbon...	MOBGCFUHMDFSCM9W	LSTM
4	MOTOROLA G60 (Soft Silver, 128 GB)	6 GB RAM	MOTOROLA	https://www.flipkart.com/motorola-g60-soft-sil...	MOBG9CJ6G5GCFAH4	LSTM



In [65]:

```
data.tail()
```

Out[65]:

	title	ram	brand	url	product_id	
842	OPPO A37f (Black, 16 GB)	2 GB RAM	OPPO	https://www.flipkart.com/oppo-a37f-black-16-gb...	MOBEWMAUFU9AFWUH	LS
843	KARBONN K9 Kavach (Champagne, 16 GB)	2 GB RAM	KARBONN	https://www.flipkart.com/karbonn-k9-kavach-cha...	MOBFYJC5CM5MHRMJ	LS1
844	OPPO Reno2 (Ocean Blue, 256 GB)	8 GB RAM	OPPO	https://www.flipkart.com/oppo-reno2-ocean-blue...	MOBFJY8YRNGGZPVD	LS
845	SAMSUNG Galaxy A53 (Light Blue, 128 GB)	8 GB RAM	SAMSUNG	https://www.flipkart.com/samsung-galaxy-a53-li...	MOBGCFVYUHHUJFNY	L
846	YU Ace (Rose Gold, 16 GB)	2 GB RAM	YU	https://www.flipkart.com/yu-ace-rose-gold-16-g...	MOBF8HV9DHJJYXGH	L

In [66]:

```
data.shape
```

Out[66]:

```
(847, 19)
```

In [67]:



```
data.columns
```

Out[67]:

```
Index(['title', 'ram', 'brand', 'url', 'product_id', 'listing_id',
      'highlights', 'availability', 'selling_price', 'original_price',
      'currency', 'avg_rating', 'ratings_count', 'reviews_count',
      'one_stars_count', 'two_stars_count', 'three_stars_count',
      'four_stars_count', 'five_stars_count'],
      dtype='object')
```

In [68]:



```
data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 847 entries, 0 to 846
Data columns (total 19 columns):
 #   Column                Non-Null Count  Dtype
---  -
 0   title                 847 non-null   object
 1   ram                   746 non-null   object
 2   brand                 847 non-null   object
 3   url                   847 non-null   object
 4   product_id           847 non-null   object
 5   listing_id           847 non-null   object
 6   highlights            847 non-null   object
 7   availability          847 non-null   object
 8   selling_price         847 non-null   int64
 9   original_price        847 non-null   int64
10   currency              847 non-null   object
11   avg_rating            847 non-null   float64
12   ratings_count         847 non-null   int64
13   reviews_count        847 non-null   int64
14   one_stars_count       847 non-null   int64
15   two_stars_count       847 non-null   int64
16   three_stars_count     847 non-null   int64
17   four_stars_count      847 non-null   int64
18   five_stars_count      847 non-null   int64
dtypes: float64(1), int64(9), object(9)
memory usage: 125.9+ KB
```

In [69]:

```
data.describe()
```

Out[69]:

	selling_price	original_price	avg_rating	ratings_count	reviews_count	one_stars_co
count	847.000000	847.000000	847.000000	847.000000	847.000000	847.0000
mean	24810.768595	27748.353011	4.178749	37161.184179	2989.429752	1866.4958
std	27771.028820	28466.642669	0.723661	85815.344152	6679.098769	4000.2210
min	3780.000000	4999.000000	0.000000	0.000000	0.000000	0.0000
25%	10990.000000	12999.000000	4.200000	874.500000	70.000000	63.0000
50%	15499.000000	17999.000000	4.300000	4237.000000	441.000000	331.0000
75%	24999.000000	27999.000000	4.400000	31605.000000	2910.500000	1848.0000
max	179900.000000	179900.000000	5.000000	912314.000000	71867.000000	36443.0000

In [70]:

```
data.isnull().sum()
```

Out[70]:

title	0
ram	101
brand	0
url	0
product_id	0
listing_id	0
highlights	0
availability	0
selling_price	0
original_price	0
currency	0
avg_rating	0
ratings_count	0
reviews_count	0
one_stars_count	0
two_stars_count	0
three_stars_count	0
four_stars_count	0
five_stars_count	0
dtype:	int64

In [71]:

```
data.dropna(inplace=True)
```

In [72]:

```
data.isnull().any().any()
```

Out[72]:

```
False
```

In [73]:

```
data.nunique()
```

Out[73]:

```
title          651
ram             7
brand          26
url           746
product_id     746
listing_id     746
highlights     453
availability    4
selling_price  301
original_price 126
currency        1
avg_rating     19
ratings_count  374
reviews_count  333
one_stars_count 323
two_stars_count 283
three_stars_count 325
four_stars_count 352
five_stars_count 377
dtype: int64
```

In [74]:

```
data['brand'].unique()
```

Out[74]:

```
array(['POCO', 'realme', 'OPPO', 'MOTOROLA', 'REDMI', 'SAMSUNG', 'vivo',
      'Infinix', 'Mi', 'GIONEE', 'Itel', 'Micromax', 'Tecno',
      'MarQ By Flipkart', 'LAVA', 'Nokia', 'TCL', 'ASUS', 'Panasonic',
      'Alcatel', 'Maplin', 'YU', 'Coolpad', 'XOLO', 'Jmax', 'KARBONN'],
      dtype=object)
```

In [75]:

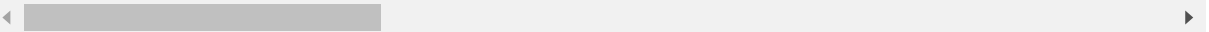
```
redmi_smartphone = data[data['brand'] == 'REDMI']
```

In [76]:

```
redmi_smartphone.head()
```

Out[76]:

	title	ram	brand	url	product_id	
11	REDMI 10 (Caribbean Green, 128 GB)	6 GB RAM	REDMI	https://www.flipkart.com/redmi-10-caribbean-gr...	MOBGC9GYQVJHKH76	LSTMOBG
13	REDMI 10 (Midnight Black, 128 GB)	6 GB RAM	REDMI	https://www.flipkart.com/redmi-10-midnight-bla...	MOBGC9GYX2QQXKWK	LSTMOBGC!
16	REDMI 9i Sport (Carbon Black, 64 GB)	4 GB RAM	REDMI	https://www.flipkart.com/redmi-9i-sport-carbon...	MOBG6WQWRGRRDBH6	LSTMOBG6W
35	REDMI 9i Sport (Coral Green, 64 GB)	4 GB RAM	REDMI	https://www.flipkart.com/redmi-9i-sport-coral-...	MOBG6WQWJRFZ5WDG	LSTMOBG6V
42	REDMI Note 10 Pro (Dark Night, 128 GB)	6 GB RAM	REDMI	https://www.flipkart.com/redmi-note-10-pro-dar...	MOBGB725PZQVNSUH	LSTMOBGB

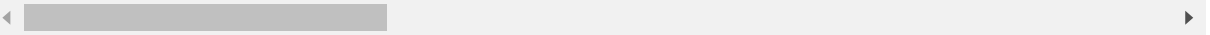


In [77]:

```
redmi_smartphone.tail()
```

Out[77]:

	title	ram	brand	url	product_id	
682	REDMI Note 10 (Aqua Green, 128 GB)	6 GB RAM	REDMI	https://www.flipkart.com/redmi- note-10-aqua-gr...	MOBGF47CCGXUZPAP	LSTMBOGF47CC
704	REDMI Note 9 (Scarlet Red, 128 GB)	6 GB RAM	REDMI	https://www.flipkart.com/redmi- note-9-scarlet-...	MOBFUNP3DYNG7HX2	LSTMBOBFUNP3I
760	REDMI Note 10T 5G (Metallic Blue, 64 GB)	4 GB RAM	REDMI	https://www.flipkart.com/redmi- note-10t-5g-met...	MOBG5GQZXZBKERSW	LSTMBOBG5GQZX
793	REDMI NOTE 10 LITE (Aurora Blue, 128 GB)	6 GB RAM	REDMI	https://www.flipkart.com/redmi- note-10-lite-au...	MOBG8YVAGZVXE86F	LSTMBOBG8YVA
829	REDMI Note 10S (Deep Sea Blue, 128 GB)	8 GB RAM	REDMI	https://www.flipkart.com/redmi- note-10s-deep-s...	MOBG3YW35FNJZJGY	LSTMBOG3YW3



In [78]:



```
redmi_smartphone['title'].value_counts()
```

Out[78]:

REDMI Note 10S (Deep Sea Blue, 128 GB)	4
REDMI Note 10S (Frost White, 128 GB)	3
REDMI Note 10 Pro (Vintage Bronze, 128 GB)	3
REDMI Note 10 Pro (Dark Night, 128 GB)	3
REDMI Note 10S (Cosmic Purple, 128 GB)	3
REDMI Note 10S (Shadow Black, 128 GB)	2
REDMI Note 10T 5G (Graphite Black, 128 GB)	2
REDMI Note 10T 5G (Metallic Blue, 128 GB)	2
REDMI Note 10T 5G (Chromium White, 64 GB)	2
REDMI Note 10S (Frost White, 64 GB)	2
REDMI NOTE 10 LITE (Aurora Blue, 128 GB)	2
REDMI Note 10T 5G (Mint Green, 64 GB)	2
REDMI Note 10S (Cosmic Purple, 64 GB)	2
REDMI Note 11S (Polar White, 128 GB)	2
REDMI 9 Power (Blazing Blue, 128 GB)	2
REDMI Note 10 Pro (Glacial Blue, 128 GB)	2
REDMI Note 11S (Horizon Blue, 128 GB)	2
REDMI Note 10T 5G (Metallic Blue, 64 GB)	2
REDMI NOTE 10 LITE (Champagne Gold, 128 GB)	2
REDMI Note 10 Pro Max (Vintage Bronze, 128 GB)	1
REDMI 10 Prime (Phantom Black, 128 GB)	1
REDMI 9i (Midnight Black, 64 GB)	1
REDMI 9i (Nature Green, 64 GB)	1
REDMI 10 (Pacific Blue, 128 GB)	1
REDMI NOTE 10 LITE (Aurora Blue, 64 GB)	1
REDMI 9 Activ (Carbon Black, 64 GB)	1
REDMI Note 10 (Aqua Green, 128 GB)	1
REDMI 10 (Midnight Black, 64 GB)	1
REDMI Note 9 (Scarlet Red, 128 GB)	1
REDMI 9 Activ (Metallic Purple, 64 GB)	1
REDMI Note 9 Pro Max (Aurora Blue, 128 GB)	1
REDMI Note 10 (Frost White, 128 GB)	1
REDMI Note 10 Pro (Dark Nebula, 128 GB)	1
REDMI 9i (Sea Blue, 64 GB)	1
REDMI 9 Activ (Carbon Black, 128 GB)	1
REDMI 9 Activ (Coral Green, 128 GB)	1
REDMI Note 11S (Space Black, 128 GB)	1
REDMI Note 10T 5G (Mint Green, 128 GB)	1
REDMI 10 Prime (Bifrost Blue, 128 GB)	1
REDMI 10 (Midnight Black, 128 GB)	1
REDMI 9i Sport (Metallic Blue, 64 GB)	1
REDMI 10 (Caribbean Green, 64 GB)	1
REDMI 10 Prime (Astral White, 64 GB)	1
REDMI Note 10T 5G (Chromium White, 128 GB)	1
REDMI 9 Activ (Coral Green, 64 GB)	1
REDMI 9 Prime (Mint Green, 64 GB)	1
REDMI 10 Prime (Astral White, 128 GB)	1
REDMI 9 Power (Electric Green, 128 GB)	1
REDMI 10 (Pacific Blue, 64 GB)	1
REDMI 9i Sport (Carbon Black, 64 GB)	1
REDMI Note 10S (Shadow Black, 64 GB)	1
REDMI Note 8 Pro (Halo White, 128 GB)	1
REDMI 8A Dual (Sky White, 32 GB)	1
REDMI 9 Power (Blazing Blue, 64 GB)	1


```
REDMI 9i Sport (Coral Green, 64 GB)      1
REDMI 10 (Caribbean Green, 128 GB)      1
REDMI Note 10 Lite (Glacier White, 128 GB)  1
REDMI Note 9 Pro Max (Champagne Gold, 64 GB)  1
Name: title, dtype: int64
```

In [79]:

▶

```
redmi_smartphone['title'].value_counts().sum()
```

Out[79]:

83

In [80]:

▶

```
redmi_smartphone.index = range(len(redmi_smartphone.index))
```

In [81]:

▶

```
redmi_smartphone.head()
```

Out[81]:

	title	ram	brand	url	product_id	
0	REDMI 10 (Caribbean Green, 128 GB)	6 GB RAM	REDMI	https://www.flipkart.com/redmi-10-caribbean-gr...	MOBGC9GYQVJHKH76	LSTMOBGC
1	REDMI 10 (Midnight Black, 128 GB)	6 GB RAM	REDMI	https://www.flipkart.com/redmi-10-midnight-bla...	MOBGC9GYX2QQXKWK	LSTMOBGC9
2	REDMI 9i Sport (Carbon Black, 64 GB)	4 GB RAM	REDMI	https://www.flipkart.com/redmi-9i-sport-carbon...	MOBG6WQWRGRRDBH6	LSTMOBG6WQ
3	REDMI 9i Sport (Coral Green, 64 GB)	4 GB RAM	REDMI	https://www.flipkart.com/redmi-9i-sport-coral-...	MOBG6WQWJRFZ5WDG	LSTMOBG6W
4	REDMI Note 10 Pro (Dark Night, 128 GB)	6 GB RAM	REDMI	https://www.flipkart.com/redmi-note-10-pro-dar...	MOBGB725PZQVNSUH	LSTMOBGB7

In [82]:

```
redmi_smartphone.tail()
```

Out[82]:

	title	ram	brand	url	product_id	
78	REDMI Note 10 (Aqua Green, 128 GB)	6 GB RAM	REDMI	https://www.flipkart.com/redmi-note-10-aqua-gr...	MOBGF47CCGXUZPAP	LSTMBOGF47CCG
79	REDMI Note 9 (Scarlet Red, 128 GB)	6 GB RAM	REDMI	https://www.flipkart.com/redmi-note-9-scarlet...	MOBFUNP3DYNG7HX2	LSTMBOBFUNP3D'
80	REDMI Note 10T 5G (Metallic Blue, 64 GB)	4 GB RAM	REDMI	https://www.flipkart.com/redmi-note-10t-5g-met...	MOBG5GQZXZBKERSW	LSTMBOG5GQZXZ
81	REDMI NOTE 10 LITE (Aurora Blue, 128 GB)	6 GB RAM	REDMI	https://www.flipkart.com/redmi-note-10-lite-au...	MOBG8YVAGZYXE86F	LSTMBOG8YVAG
82	REDMI Note 10S (Deep Sea Blue, 128 GB)	8 GB RAM	REDMI	https://www.flipkart.com/redmi-note-10s-deep-s...	MOBG3YW35FNJZJGY	LSTMBOG3YW35

In [83]:

```
new = redmi_smartphone["ram"].str.split(" ", n = 2, expand = True)
```

In [84]:

```
redmi_smartphone['ram_val'] = new[0]
```

<ipython-input-84-c302d89de866>:1: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy (https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy)

```
redmi_smartphone['ram_val'] = new[0]
```

In [85]:



```
redmi_smartphone['ram_val'].head()
```

Out[85]:

```
0    6
1    6
2    4
3    4
4    6
Name: ram_val, dtype: object
```

In [86]:



```
redmi_smartphone['ram_val'] = redmi_smartphone['ram_val'].astype(int)
```

<ipython-input-86-01a8a7b5ec86>:1: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy (https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy)

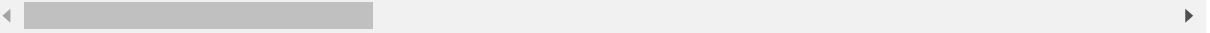
```
redmi_smartphone['ram_val'] = redmi_smartphone['ram_val'].astype(int)
```

In [87]:

```
redmi_smartphone.head()
```

Out[87]:

	title	ram	brand	url	product_id	
0	REDMI 10 (Caribbean Green, 128 GB)	6 GB RAM	REDMI	https://www.flipkart.com/redmi-10-caribbean-gr...	MOBGC9GYQVJHKH76	LSTMOBGC
1	REDMI 10 (Midnight Black, 128 GB)	6 GB RAM	REDMI	https://www.flipkart.com/redmi-10-midnight-bla...	MOBGC9GYX2QQXKWK	LSTMOBGC9
2	REDMI 9i Sport (Carbon Black, 64 GB)	4 GB RAM	REDMI	https://www.flipkart.com/redmi-9i-sport-carbon...	MOBG6WQWRGRRDBH6	LSTMOBG6WQ
3	REDMI 9i Sport (Coral Green, 64 GB)	4 GB RAM	REDMI	https://www.flipkart.com/redmi-9i-sport-coral-...	MOBG6WQWJRFZ5WDG	LSTMOBG6W
4	REDMI Note 10 Pro (Dark Night, 128 GB)	6 GB RAM	REDMI	https://www.flipkart.com/redmi-note-10-pro-dar...	MOGB725PZQVNSUH	LSTMGB7

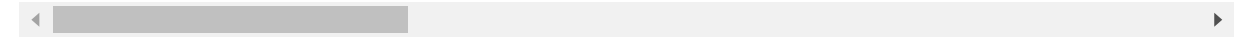


In [88]:

```
redmi_smartphone.tail()
```

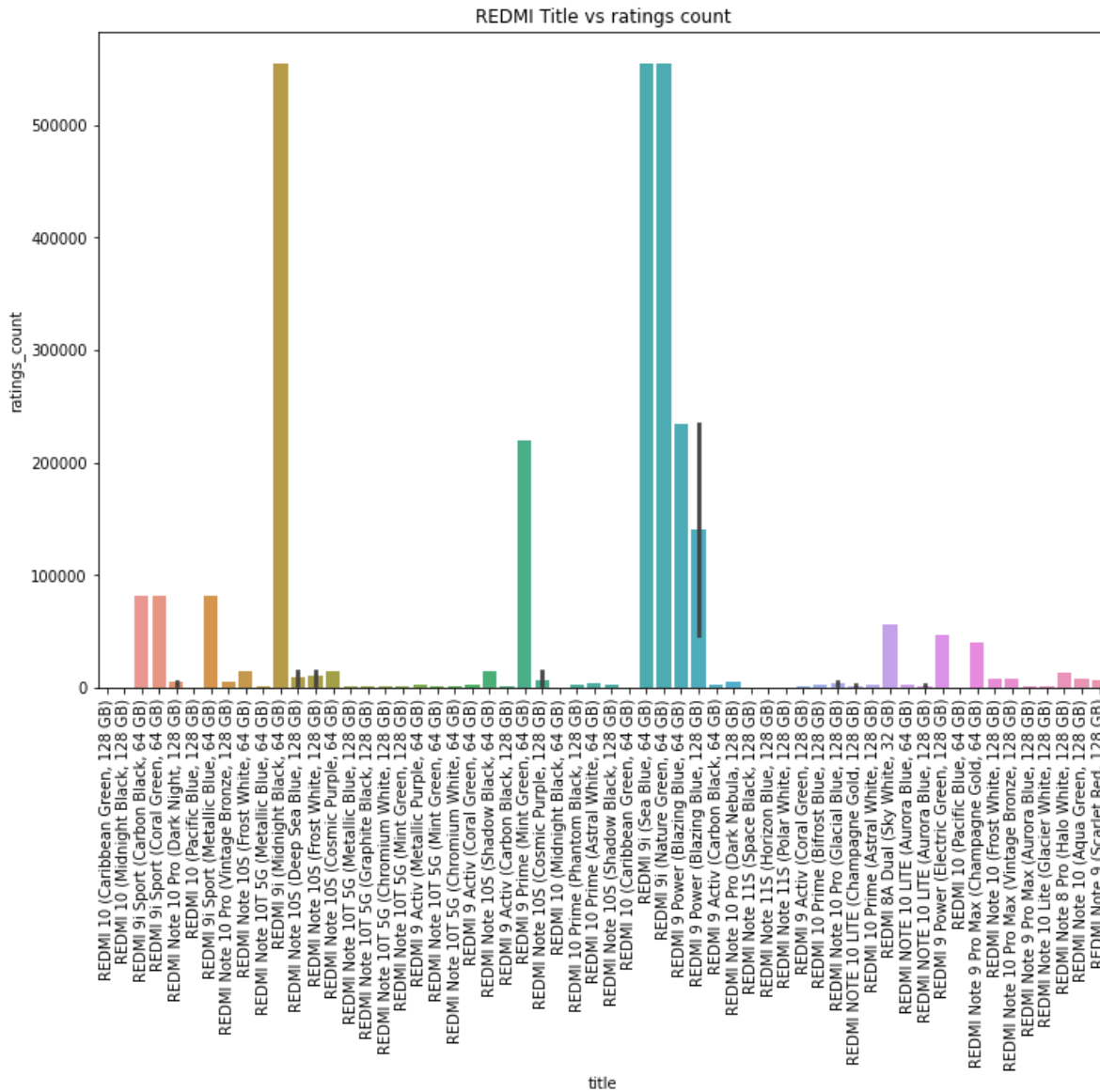
Out[88]:

	title	ram	brand	url	product_id
78	REDMI Note 10 (Aqua Green, 128 GB)	6 GB RAM	REDMI	https://www.flipkart.com/redmi- note-10-aqua-gr...	MOBGF47CCGXUZPAP LSTMOBGF47CCG
79	REDMI Note 9 (Scarlet Red, 128 GB)	6 GB RAM	REDMI	https://www.flipkart.com/redmi- note-9-scarlet-...	MOBFUNP3DYNG7HX2 LSTMOBFUNP3D'
80	REDMI Note 10T 5G (Metallic Blue, 64 GB)	4 GB RAM	REDMI	https://www.flipkart.com/redmi- note-10t-5g-met...	MOBG5GQZXZBKERSW LSTMOBG5GQZXZ
81	REDMI NOTE 10 LITE (Aurora Blue, 128 GB)	6 GB RAM	REDMI	https://www.flipkart.com/redmi- note-10-lite-au...	MOBG8YVAGZVXE86F LSTMOBG8YVAG
82	REDMI Note 10S (Deep Sea Blue, 128 GB)	8 GB RAM	REDMI	https://www.flipkart.com/redmi- note-10s-deep-s...	MOBG3YW35FNJZJGY LSTMOBG3YW35

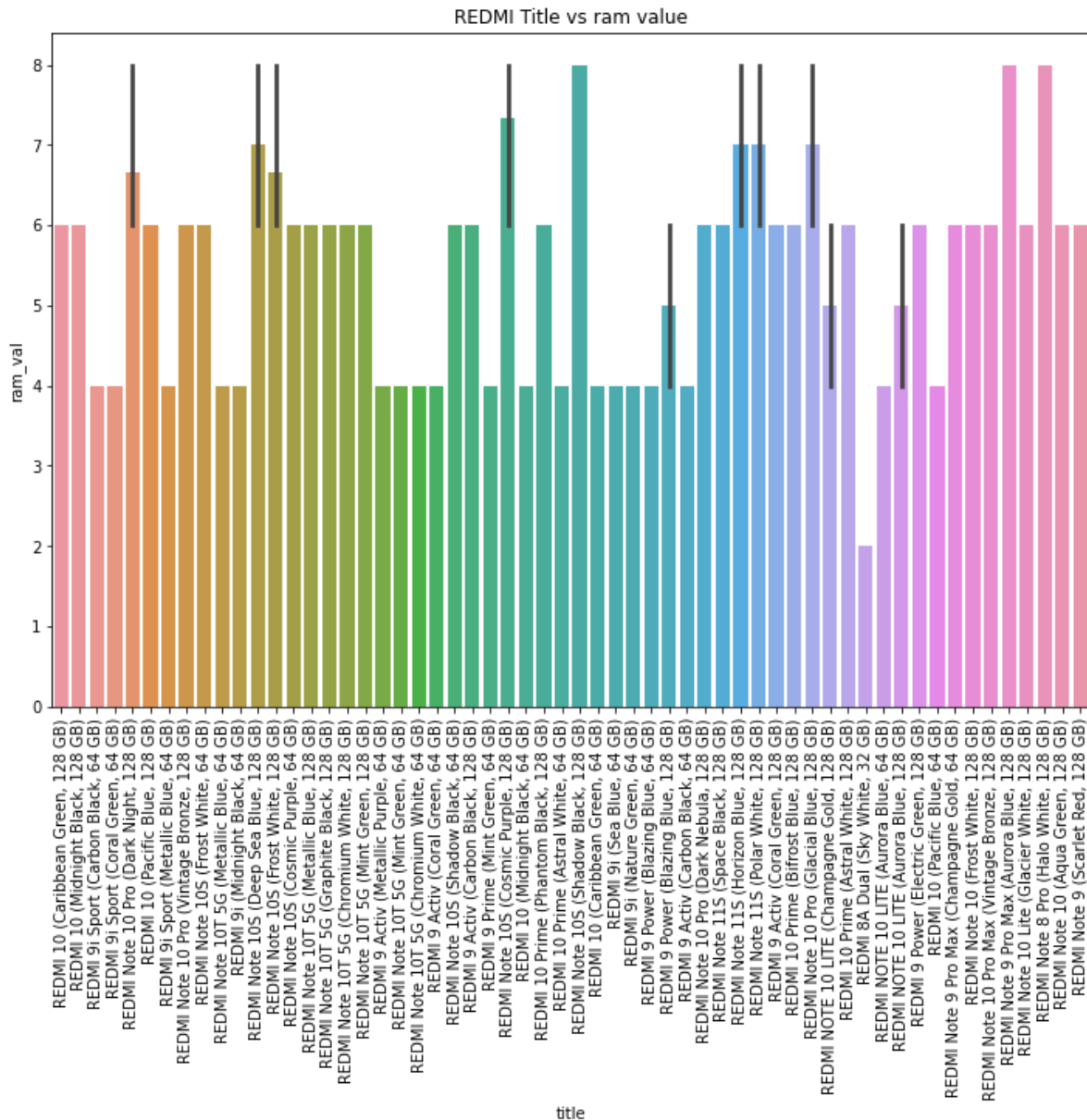


Model	avg_rating
REDMI 10 (Caribbean Green, 128 GB)	4.6
REDMI 10 (Midnight Black, 128 GB)	4.6
REDMI 9i Sport (Carbon Black, 64 GB)	4.4
REDMI 9i Sport (Coral Green, 64 GB)	4.4
REDMI Note 10 Pro (Dark Night, 128 GB)	4.3
REDMI 10 (Pacific Blue, 128 GB)	4.6
REDMI 9i Sport (Metallic Blue, 64 GB)	4.4
REDMI Note 10 Pro (Vintage Bronze, 128 GB)	4.3
REDMI Note 10S (Frost White, 64 GB)	4.3
REDMI Note 10T 5G (Metallic Blue, 64 GB)	4.2
REDMI 9i (Midnight Black, 64 GB)	4.3
REDMI Note 10S (Deep Sea Blue, 128 GB)	4.3
REDMI Note 10S (Frost White, 128 GB)	4.3
REDMI Note 10S (Cosmic Purple, 64 GB)	4.3
REDMI Note 10T 5G (Metallic Blue, 128 GB)	4.3
REDMI Note 10T 5G (Graphite Black, 128 GB)	4.3
REDMI Note 10T 5G (Chromium White, 128 GB)	4.3
REDMI Note 10T 5G (Mint Green, 128 GB)	4.3
REDMI 9 Activ (Metallic Purple, 64 GB)	4.2
REDMI Note 10T 5G (Mint Green, 64 GB)	4.2
REDMI Note 10T 5G (Chromium White, 64 GB)	4.2
REDMI 9 Activ (Coral Green, 64 GB)	4.3
REDMI Note 10S (Shadow Black, 64 GB)	4.3
REDMI 9 Activ (Carbon Black, 128 GB)	4.2
REDMI 9 Prime (Mint Green, 64 GB)	4.4
REDMI Note 10S (Cosmic Purple, 128 GB)	4.2
REDMI 10 (Midnight Black, 64 GB)	4.3
REDMI 10 Prime (Phantom Black, 128 GB)	4.6
REDMI 10 Prime (Astral White, 64 GB)	4.2
REDMI Note 10S (Shadow Black, 128 GB)	4.2
REDMI 10 (Caribbean Green, 64 GB)	4.6
REDMI 9i (Sea Blue, 64 GB)	4.3
REDMI 9i (Nature Green, 64 GB)	4.3
REDMI 9 Power (Blazing Blue, 64 GB)	4.3
REDMI 9 Power (Blazing Blue, 128 GB)	4.3
REDMI 9 Activ (Carbon Black, 64 GB)	4.2
REDMI Note 10 Pro (Dark Nebula, 128 GB)	4.3
REDMI Note 11S (Space Black, 128 GB)	4.3
REDMI Note 11S (Horizon Blue, 128 GB)	3.4
REDMI Note 11S (Polar White, 128 GB)	4.0
REDMI 9 Activ (Coral Green, 128 GB)	4.2
REDMI 10 Prime (Bifrost Blue, 128 GB)	4.2
REDMI Note 10 Pro (Glacial Blue, 128 GB)	4.3
REDMI NOTE 10 LITE (Champagne Gold, 128 GB)	4.3
REDMI 10 Prime (Astral White, 128 GB)	4.2
REDMI 8A Dual (Sky White, 32 GB)	4.3
REDMI NOTE 10 LITE (Aurora Blue, 64 GB)	4.3
REDMI NOTE 10 LITE (Aurora Blue, 128 GB)	4.3
REDMI 9 Power (Electric Green, 128 GB)	4.3
REDMI 10 (Pacific Blue, 64 GB)	4.4
REDMI 10 (Champagne Gold, 64 GB)	4.4
REDMI Note 10 (Frost White, 128 GB)	4.3
REDMI Note 10 Pro Max (Vintage Bronze, 128 GB)	4.2
REDMI Note 9 Pro Max (Aurora Blue, 128 GB)	4.4
REDMI Note 10 Lite (Glacier White, 128 GB)	4.3
REDMI Note 8 Pro (Halo White, 128 GB)	4.4
REDMI Note 10 (Aqua Green, 128 GB)	4.3
REDMI Note 9 (Scarlet Red, 128 GB)	4.3


```
plt.figure(figsize = (12,8))
plt.xticks(rotation = 90)
sns.barplot(x = redmi_smartphone.title, y = redmi_smartphone.ratings_count)
plt.title("REDMI Title vs ratings count")
plt.show()
```



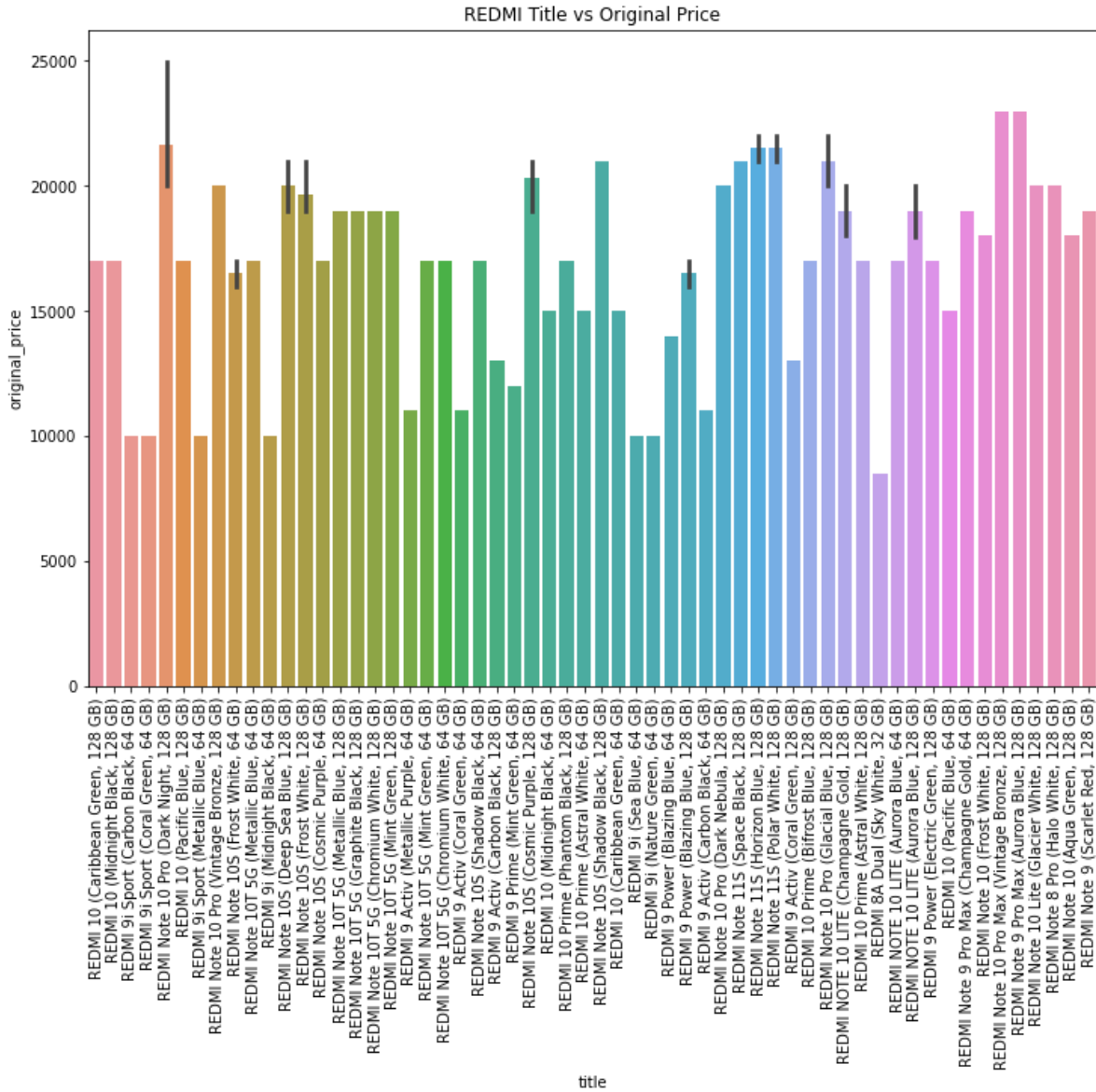

```
plt.figure(figsize = (12,8))
plt.xticks(rotation = 90)
sns.barplot(x = redmi_smartphone.title, y = redmi_smartphone.ram_val)
plt.title("REDMI Title vs ram value")
plt.show()
```



REDMI Title vs Selling price

Model	Selling Price (approx.)
REDMI 10 (Caribbean Green, 128 GB)	13000
REDMI 10 (Midnight Black, 128 GB)	13000
REDMI 9i Sport (Carbon Black, 64 GB)	9000
REDMI 9i Sport (Coral Green, 64 GB)	9000
REDMI Note 10 Pro (Dark Night, 128 GB)	18000
REDMI 10 (Pacific Blue, 128 GB)	13000
REDMI 9i Sport (Metallic Blue, 64 GB)	9000
REDMI Note 10 Pro (Vintage Bronze, 128 GB)	17000
REDMI Note 10S (Frost White, 64 GB)	14500
REDMI Note 10S (Frost White, 64 GB)	13500
REDMI 9i (Midnight Black, 64 GB)	9000
REDMI Note 10S (Deep Sea Blue, 128 GB)	16500
REDMI Note 10S (Frost White, 128 GB)	16000
REDMI Note 10S (Cosmic Purple, 64 GB)	14500
REDMI Note 10T 5G (Metallic Blue, 128 GB)	15500
REDMI Note 10T 5G (Graphite Black, 128 GB)	15500
REDMI Note 10T 5G (Chromium White, 128 GB)	15500
REDMI Note 10T 5G (Mint Green, 128 GB)	15500
REDMI 9 Activ (Metallic Purple, 64 GB)	10000
REDMI Note 10T 5G (Mint Green, 64 GB)	13500
REDMI Note 10T 5G (Chromium White, 64 GB)	13500
REDMI 9 Activ (Coral Green, 64 GB)	10000
REDMI Note 10S (Shadow Black, 64 GB)	15000
REDMI 9 Activ (Carbon Black, 128 GB)	12000
REDMI 9 Prime (Mint Green, 64 GB)	10500
REDMI Note 10S (Cosmic Purple, 128 GB)	16500
REDMI 10 (Midnight Black, 64 GB)	11000
REDMI 10 Prime (Phantom Black, 128 GB)	15500
REDMI 10 Prime (Astral White, 64 GB)	13500
REDMI Note 10S (Shadow Black, 128 GB)	17500
REDMI 10 (Caribbean Green, 64 GB)	11000
REDMI 9i (Sea Blue, 64 GB)	9000
REDMI 9i (Nature Green, 64 GB)	9000
REDMI 9 Power (Blazing Blue, 64 GB)	13000
REDMI 9 Power (Blazing Blue, 128 GB)	14000
REDMI 9 Activ (Carbon Black, 64 GB)	10000
REDMI Note 10 Pro (Dark Nebula, 128 GB)	18500
REDMI Note 11S (Space Black, 128 GB)	19000
REDMI Note 11S (Horizon Blue, 128 GB)	18500
REDMI Note 11S (Polar White, 128 GB)	19000
REDMI 9 Activ (Coral Green, 128 GB)	12000
REDMI 10 Prime (Bifrost Blue, 128 GB)	15500
REDMI Note 10 Pro (Glacial Blue, 128 GB)	19500
REDMI Note 10 Lite (Champagne Gold, 128 GB)	16500
REDMI 10 Prime (Astral White, 128 GB)	15000
REDMI 8A Dual (Sky White, 32 GB)	9000
REDMI Note 10 Lite (Aurora Blue, 64 GB)	14500
REDMI Note 10 Lite (Aurora Blue, 128 GB)	14500
REDMI 9 Power (Electric Green, 128 GB)	15000
REDMI 10 (Pacific Blue, 64 GB)	11000
REDMI Note 9 Pro Max (Champagne Gold, 64 GB)	19000
REDMI Note 10 (Frost White, 128 GB)	16500
REDMI Note 10 Pro Max (Vintage Bronze, 128 GB)	22000
REDMI Note 9 Pro Max (Aurora Blue, 128 GB)	22500
REDMI Note 10 Lite (Glacier White, 128 GB)	15500
REDMI Note 8 Pro (Halo White, 128 GB)	20000
REDMI Note 10 (Aqua Green, 128 GB)	16500
REDMI Note 9 (Scarlet Red, 128 GB)	13000


```
plt.figure(figsize = (12,8))
plt.xticks(rotation = 90)
sns.barplot(x = redmi_smartphone.title, y = redmi_smartphone.original_price)
plt.title("REDMI Title vs Original Price")
plt.show()
```



In [100]:

```
x = redmi_smartphone.drop(['title', 'ram', 'brand', 'url', 'product_id', 'listing_id',  
                           'availability', 'selling_price', 'currency'], axis = 1)  
y = redmi_smartphone['selling_price']
```

In [101]:

```
x.shape
```

Out[101]:

```
(83, 10)
```

In [102]:

```
y.shape
```

Out[102]:

```
(83,)
```

In [103]:

```
from sklearn.linear_model import LinearRegression  
from sklearn.model_selection import train_test_split  
X_train, X_test, y_train, y_test = train_test_split(x, y, test_size = 0.2)
```

In [104]:

```
model_india=LinearRegression()  
model_india.fit(x,y)
```

Out[104]:

```
LinearRegression()
```

In [105]:

```
print("Training Accuracy :", model_india.score(X_train, y_train))  
print("Testing Accuracy :", model_india.score(X_test, y_test))
```

```
Training Accuracy : 0.9132131428738655
```

```
Testing Accuracy : 0.795688677544443
```

In [106]:



```
print("Coefficient: ",model_india.coef_)
print("intercept: ",model_india.intercept_)
pre = model_india.predict(x)
```

```
Coefficient: [ 8.42315002e-01 -8.29447236e+01  4.15201906e-01  2.19273271
e+00
-3.83308885e+00  6.63225275e+00 -5.94854621e-01 -1.56023499e+00
-2.28872376e-01  2.56855281e+02]
intercept: -931.4982076256183
```

In [108]:



```
from sklearn.metrics import mean_squared_error
print("By function: ",mean_squared_error(y,model_india.predict(x)))
```

```
By function: 1050679.4536276404
```