

Smartphone Recommender System using Cosine Similarity

datasource (original): <https://www.kaggle.com/datasets/gyanprakashkushwaha/mobile-recommendation-system-dataset>

datasource (processed): <https://github.com/CassienBABEY/Mobile-Data-Exploration-and-ML/tree/main>

```
In [1]: import pandas as pd
import numpy as np
from sklearn.feature_extraction.text import CountVectorizer
from sklearn.metrics.pairwise import cosine_similarity
```

```
In [2]: df = pd.read_csv("mobile_characteristics.csv")
```

```
In [3]: df.head()
```

	ratings	price		imgURL	corpus	brand	mobile_name	color	storage	system	processor_type	resolution	size
0	4.2	291		https://rukminim2.flixcart.com/image/312/312/x...	storage128 gbram6 systemandroid 12processor t...	redmi	Note 12 Pro 5G	black	128	android	mediatek	Full HD	6.7
1	4.5	255		https://rukminim2.flixcart.com/image/312/312/k...	storage128 gbram6 gbexpandable storage256gb s...	oppo	F11 Pro	green	128	android	mediatek	Full HD	6.5
2	4.2	159		https://rukminim2.flixcart.com/image/312/312/x...	storage64 gbram4 systemandroid 11processor sp...	redmi	Note 11	white	64	android	intel	Full HD	6.4
3	4.1	267		https://rukminim2.flixcart.com/image/312/312/x...	storage256 gbram12 systemandroid q 11processo...	oneplus	Nord CE 5G	blue	256	android	qualcomm	Full HD	6.4
4	4.3	121		https://rukminim2.flixcart.com/image/312/312/k...	storage64 gbram4 gbexpandable storage256gb sy...	infinix	Hot 11	green	64	android	mediatek	Full HD	6.6

```
In [4]: df = df.iloc[:, [0,1,4,5,7,8,9,10,11]]
```

```
In [5]: df.head()
```

	ratings	price	brand	mobile_name	storage	system	processor_type	resolution	size
0	4.2	291	redmi	Note 12 Pro 5G	128	android	mediatek	Full HD	6.7
1	4.5	255	oppo	F11 Pro	128	android	mediatek	Full HD	6.5
2	4.2	159	redmi	Note 11	64	android	intel	Full HD	6.4
3	4.1	267	oneplus	Nord CE 5G	256	android	qualcomm	Full HD	6.4
4	4.3	121	infinix	Hot 11	64	android	mediatek	Full HD	6.6

```
In [6]: df["new_corpus"] = df[["price", "brand", "mobile_name", "storage", "system",
                             "processor_type", "resolution", "size"]].astype(str).agg(' '.join, axis=1)
df.head()
```

	ratings	price	brand	mobile_name	storage	system	processor_type	resolution	size	new_corpus
0	4.2	291	redmi	Note 12 Pro 5G	128	android	mediatek	Full HD	6.7	291 redmi Note 12 Pro 5G 128 android mediatek ...
1	4.5	255	oppo	F11 Pro	128	android	mediatek	Full HD	6.5	255 oppo F11 Pro 128 android mediatek Full HD 6.5
2	4.2	159	redmi	Note 11	64	android	intel	Full HD	6.4	159 redmi Note 11 64 android intel Full HD 6.4
3	4.1	267	oneplus	Nord CE 5G	256	android	qualcomm	Full HD	6.4	267 oneplus Nord CE 5G 256 android qualcomm Fu...
4	4.3	121	infinix	Hot 11	64	android	mediatek	Full HD	6.6	121 infinix Hot 11 64 android mediatek Full HD...

```
In [7]: CV = CountVectorizer()
cv_matrix = CV.fit_transform(df['new_corpus'])
```

```
In [8]: cos_similarity = cosine_similarity(cv_matrix)
```

```
In [9]: index = 262
pd.DataFrame(df.iloc[index]).transpose()
```

	ratings	price	brand	mobile_name	storage	system	processor_type	resolution	size	new_corpus
262	4.3	139	samsung	Galaxy F22	64	android	mediatek	HD	6.4	139 samsung Galaxy F22 64 android mediatek HD 6.4

```
In [10]: similar_index = cos_similarity[index]
df_result = df.copy()
df_result["similarity"] = similar_index
df_result = df_result.sort_values(by=['similarity'], ascending=False)
df_result = df_result.drop_duplicates(subset='similarity', keep="first")
df_result = df_result.loc[df_result["mobile_name"] != df.mobile_name[index]]
df_result[['brand', 'mobile_name', 'storage', 'system',
            'processor_type', 'resolution', 'size', 'ratings', 'price', 'similarity']].head(10)
```

	brand	mobile_name	storage	system	processor_type	resolution	size	ratings	price	similarity
1335	samsung	Galaxy A03s	64	android	mediatek	HD	6.5	4.2	176	0.750000
392	samsung	Galaxy A12	64	android	samsung	HD	6.5	4.3	170	0.670820
683	oppo	A31	64	android	mediatek	HD	6.5	4.5	139	0.668153
383	samsung	Galaxy M30s	64	android	samsung	Full HD	6.4	4.1	170	0.639602
1236	samsung	Galaxy A22	128	android	mediatek	HD	6.4	4.2	249	0.625000
736	samsung	Galaxy On Nxt	64	android	samsung	Full HD	5.5	4.3	217	0.612372
1562	samsung	Galaxy A31	128	android	mediatek	Full HD	6.4	4.6	291	0.589256
179	realme	3	64	android	mediatek	HD	6.2	4.5	115	0.577350
1315	samsung	Galaxy F12	128	android	samsung	HD	6.5	4.3	145	0.559017
1022	samsung	M02s	64	android	qualcomm	HD	6.5	4.2	123	0.534522