1]: #	#impor	rting nece	essary lib	praries									
		pandas a numpy as											
3	Gmatpl	matplotl lotlib in plotly a		as plt									
d	df=pd.	read_csv(	("D:/proje	ects/udemy/	laptop	price predictor/lapto	p_data.csv")						
d	lf												
		Unnamed: 0	Company	TypeName	Inches	ScreenResolution	Сри	Ram	Memory	Gpu	Op Sys	Weight	Price
Ī	0	0	Apple	Ultrabook	13.3	IPS Panel Retina Display 2560x1600	Intel Core i5 2.3GHz	8GB	128GB SSD	Intel Iris Plus Graphics 640	macOS	1.37kg	71378.6832
	1	1	Apple	Ultrabook	13.3	1440x900	Intel Core i5 1.8GHz	8GB	128GB Flash Storage	Intel HD Graphics 6000	macOS	1.34kg	47895.5232
	2	2	HP	Notebook	15.6	Full HD 1920x1080	Intel Core i5 7200U 2.5GHz	8GB	256GB SSD	Intel HD Graphics 620	No OS	1.86kg	30636.0000
	3	3	Apple	Ultrabook	15.4	IPS Panel Retina Display 2880x1800	Intel Core i7 2.7GHz	16GB	512GB SSD	AMD Radeon Pro 455	macOS	1.83kg	135195.3360
	4	4	Apple	Ultrabook	13.3	IPS Panel Retina Display 2560x1600	Intel Core i5 3.1GHz	8GB	256GB SSD	Intel Iris Plus Graphics 650	macOS	1.37kg	96095.8080
				***									
	1298	1298	Lenovo	2 in 1 Convertible	14.0	IPS Panel Full HD / Touchscreen 1920x1080	Intel Core i7 6500U 2.5GHz	4GB	128GB SSD	Intel HD Graphics 520	Windows 10	1.8kg	33992.6400
	1299	1299	Lenovo	2 in 1 Convertible	13.3	IPS Panel Quad HD+ / Touchscreen 3200x1800	Intel Core i7 6500U 2.5GHz	16GB	512GB SSD	Intel HD Graphics 520	Windows 10	1.3kg	79866.7200
	1300	1300	Lenovo	Notebook	14.0	1366x768	Intel Celeron Dual Core N3050 1.6GHz	2GB	64GB Flash Storage	Intel HD Graphics	Windows 10	1.5kg	12201.1200
	1301	1301	HP	Notebook	15.6	1366x768	Intel Core i7 6500U 2.5GHz	6GB	1TB HDD	AMD Radeon R5 M330	Windows 10	2.19kg	40705.9200
	1302	1302	Asus	Notebook	15.6	1366x768	Intel Celeron Dual Core N3050 1.6GHz	4GB	500GB HDD	Intel HD Graphics	Windows 10	2.2kg	19660.3200

1303 rows × 12 columns

```
In [4]: df.columns
Out[4]: Index(['Unnamed: 0', 'Company', 'TypeName', 'Inches', 'ScreenResolution',
                'Cpu', 'Ram', 'Memory', 'Gpu', 'OpSys', 'Weight', 'Price'],
              dtype='object')
In [5]: df.isnull().sum()
Out[5]: Unnamed: 0
                             0
        Company
                             0
                             0
        TypeName
        Inches
                             0
        ScreenResolution
                             0
                             0
        Cpu
                             0
        Ram
        Memory
                             0
                             0
        Gpu
        OpSys
        Weight
        Price
        dtype: int64
In [6]: df.duplicated().sum()
Out[6]: 0
In [7]: df.info()
        <class 'pandas.core.frame.DataFrame'>
        RangeIndex: 1303 entries, 0 to 1302
        Data columns (total 12 columns):
                               Non-Null Count Dtype
             Column
             Unnamed: 0
                               1303 non-null
                                                int64
             Company
                               1303 non-null
                                                object
             TypeName
                                1303 non-null
                                                object
         2
             Inches
                                1303 non-null
                                                float64
                                                object
             ScreenResolution 1303 non-null
         5
             Cpu
                                1303 non-null
                                                object
         6
              Ram
                                1303 non-null
                                                object
         7
                                1303 non-null
                                                object
             Memory
                                1303 non-null
                                                object
         8
             Gpu
                               1303 non-null
         9
              OpSys
                                                object
         10 Weight
                               1303 non-null
                                                object
                                                float64
         11 Price
                                1303 non-null
        dtypes: float64(2), int64(1), object(9)
        memory usage: 122.3+ KB
```

```
In [10]: for i in df.columns:
            print(f'Details of particular {i} is : {df[i].unique()}')
            print('-'*75)
        Details of particular Unnamed: 0 is : [ 0 1 2 ... 1300 1301 1302]
        Details of particular Company is : ['Apple' 'HP' 'Acer' 'Asus' 'Dell' 'Lenovo' 'Chuwi' 'MSI' 'Microsoft'
         'Toshiba' 'Huawei' 'Xiaomi' 'Vero' 'Razer' 'Mediacom' 'Samsung' 'Google'
         'Fujitsu' 'LG']
        Details of particular TypeName is : ['Ultrabook' 'Notebook' 'Netbook' 'Gaming' '2 in 1 Convertible'
         'Workstation']
        Details of particular Inches is: [13.3 15.6 15.4 14. 12. 11.6 17.3 10.1 13.5 12.5 13. 18.4 13.9 12.3
         17. 15. 14.1 11.3
        Details of particular ScreenResolution is: ['IPS Panel Retina Display 2560x1600' '1440x900' 'Full HD 1920x1080'
         'IPS Panel Retina Display 2880x1800' '1366x768'
         'IPS Panel Full HD 1920x1080' 'IPS Panel Retina Display 2304x1440'
         'IPS Panel Full HD / Touchscreen 1920x1080'
         'Full HD / Touchscreen 1920x1080' 'Touchscreen / Quad HD+ 3200x1800'
         'IPS Panel Touchscreen 1920x1200' 'Touchscreen 2256x1504'
         'Quad HD+ / Touchscreen 3200x1800' 'IPS Panel 1366x768'
In [11]: df=df[['Company', 'TypeName', 'Inches', 'ScreenResolution',
              'Cpu', 'Ram', 'Memory', 'Gpu', 'OpSys', 'Weight', 'Price']]
In [12]: df.info()
        <class 'pandas.core.frame.DataFrame'>
        RangeIndex: 1303 entries, 0 to 1302
        Data columns (total 11 columns):
         # Column Non-Null Count Dtype
         --- -----
                            -----
         0 Company
                           1303 non-null object
         1 TypeName 1303 non-null object
                            1303 non-null float64
         2 Inches
         3 ScreenResolution 1303 non-null object
                    1303 non-null object
         4 Cpu
                          1303 non-null object
         5 Ram
         6 Memory
                           1303 non-null object
                          1303 non-null object
            Gpu
                            1303 non-null object
         8 OpSys
                        1303 non-null object
         9 Weight
         10 Price
                            1303 non-null float64
        dtypes: float64(2), object(9)
```

memory usage: 112.1+ KB

```
In [14]: catvar, numvar
Out[14]: (Index(['Company', 'TypeName', 'ScreenResolution', 'Cpu', 'Ram', 'Memory',
                   'Gpu', 'OpSys', 'Weight'],
                  dtvpe='object').
           Index(['Inches', 'Price'], dtype='object'))
In [16]: df['Weight']=df['Weight'].str.replace('kg'," ")
          df['Ram']=df['Ram'].str.replace('GB'," ")
          C:\Users\basha\AppData\Local\Temp\ipykernel 30028\1311007701.py: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-ve
          rsus-a-copy
            df['Weight']=df['Weight'].str.replace('kg'," ")
          C:\Users\basha\AppData\Local\Temp\ipykernel 30028\1311007701.py:2: 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-ve
          rsus-a-copy
            df['Ram']=df['Ram'].str.replace('GB'," ")
In [17]:
          df.head()
Out[17]:
                                                                                Cpu Ram
              Company TypeName Inches
                                                  ScreenResolution
                                                                                                 Memory
                                                                                                                           OpSys Weight
                                                                                                                                                Price
                                              IPS Panel Retina Display
                                                                                                                 Intel Iris Plus
                        Ultrabook
                                   13.3
                                                                   Intel Core i5 2.3GHz
                                                                                       8
                                                                                               128GB SSD
                                                                                                                            macOS
                                                                                                                                          71378.6832
                 Apple
                                                                                                                                     1.37
                                                                                                                Graphics 640
                                                        2560x1600
                                                                                              128GB Flash
                                                                                                             Intel HD Graphics
                        Ultrabook
                                   13.3
                                                         1440x900
                                                                   Intel Core i5 1.8GHz
                                                                                       8
                                                                                                                            macOS
                                                                                                                                           47895.5232
                 Apple
                                                                                                  Storage
                                                                                                                      6000
                                                                     Intel Core i5 7200U
                                                                                                             Intel HD Graphics
           2
                        Notebook
                                   15.6
                                                  Full HD 1920x1080
                                                                                       8
                                                                                               256GB SSD
                                                                                                                            No OS
                                                                                                                                     1.86
                                                                                                                                           30636.0000
                                                                             2.5GHz
                                              IPS Panel Retina Display
                                   15.4
                                                                   Intel Core i7 2.7GHz
                                                                                       16
                                                                                               512GB SSD AMD Radeon Pro 455 macOS
                                                                                                                                         135195.3360
                 Apple
                        Ultrabook
```

Intel Core i5 3.1GHz

8

256GB SSD

Intel Iris Plus

Graphics 650

macOS

1.37

96095.8080

2880x1800

2560x1600

IPS Panel Retina Display

In [13]: catvar=df.select dtypes(include=['object']).columns

Ultrabook

Apple

13.3

numvar=df.select dtypes(include=['int32','float32','float64']).columns

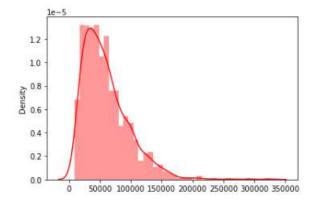
```
In [18]: df['Ram'] = df['Ram'].astype('int32')
         C:\Users\basha\AppData\Local\Temp\ipykernel 30028\1977328478.py:1: SettingWithCopyWarning:
         A value is trying to be set on a copy of a slice from a DataFrame.
         Try using .loc[row indexer,col indexer] = value instead
         See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user guide/indexing.html#returning-a-view-ve
         rsus-a-copy
           df['Ram'] = df['Ram'].astype('int32')
In [19]: df['Weight'] = df['Weight'].astype('float32')
         C:\Users\basha\AppData\Local\Temp\ipykernel 30028\528318470.py: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-ve
         rsus-a-copy
           df['Weight'] = df['Weight'].astype('float32')
In [20]: df.info()
         <class 'pandas.core.frame.DataFrame'>
         RangeIndex: 1303 entries, 0 to 1302
         Data columns (total 11 columns):
          # Column
                               Non-Null Count Dtype
             Company
                         1303 non-null object
                           1303 non-null object
             TypeName
          1
                             1303 non-null float64
             Inches
             ScreenResolution 1303 non-null
                                              object
                                              object
                          1303 non-null
              Cpu
                            1303 non-null
          5
              Ram
                                              int32
                                              object
          6
             Memory
                             1303 non-null
                            1303 non-null
          7
              Gpu
                                              object
              0pSys
                          1303 non-null
                                              object
             Weight
                           1303 non-null
                                              float32
          10 Price
                             1303 non-null float64
         dtypes: float32(1), float64(2), int32(1), object(7)
         memory usage: 101.9+ KB
```

# **EXPLORATORY DATA ANALYSIS**

```
In [21]: import seaborn as sn
sn.distplot(x = df['Price'],color='red',bins = 40)

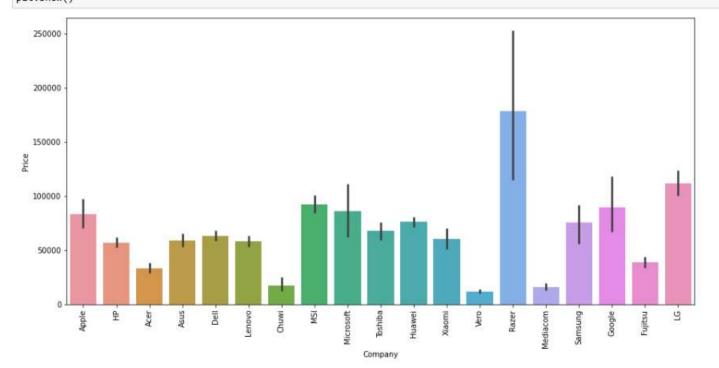
C:\Users\basha\anaconda3\lib\site-packages\seaborn\distributions.py:2619: FutureWarning: `distplot` is a deprecated function an
d will be removed in a future version. Please adapt your code to use either `displot` (a figure-level function with similar fle
xibility) or `histplot` (an axes-level function for histograms).
warnings.warn(msg, FutureWarning)
```

### Out[21]: <AxesSubplot:ylabel='Density'>



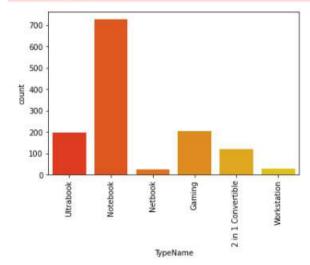
```
In [22]: def drawplot(col):
    plt.figure(figsize=(15,7))
    sn.countplot(df[col],palette='plasma')
    plt.xticks(rotation='vertical')
```

In [24]: #average price of laptop
plt.figure(figsize=(15,7))
sn.barplot(x=df['Company'],y=df['Price'])
plt.xticks(rotation='vertical')
plt.show()

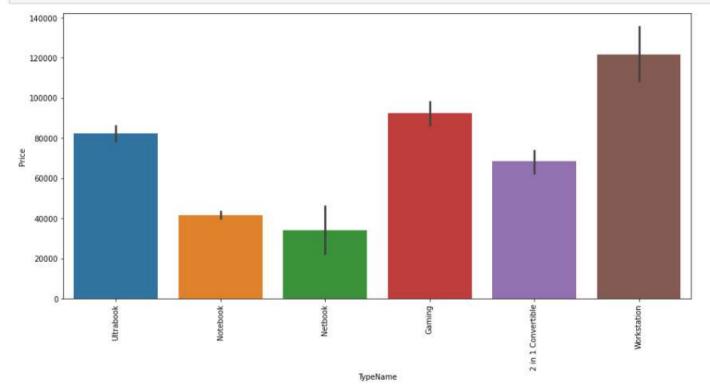


# In [25]: #average types of laptop sn.countplot(df['TypeName'],palette='autumn') plt.xticks(rotation='vertical') plt.show()

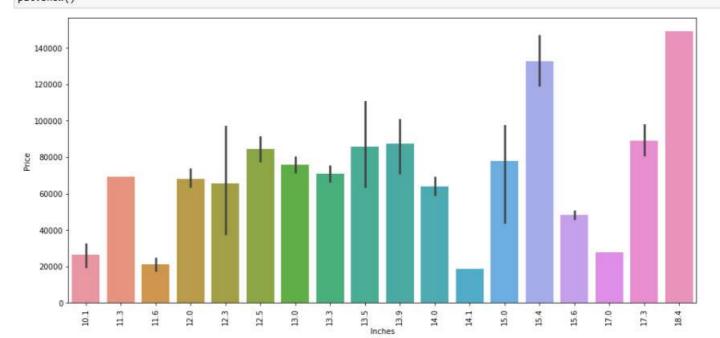
C:\Users\basha\anaconda3\lib\site-packages\seaborn\\_decorators.py:36: FutureWarning: Pass the following variable as a keyword a
rg: x. From version 0.12, the only valid positional argument will be `data`, and passing other arguments without an explicit ke
yword will result in an error or misinterpretation.
warnings.warn(



In [26]: #average price of laptop
plt.figure(figsize=(15,7))
sn.barplot(x=df['TypeName'],y=df['Price'])
plt.xticks(rotation='vertical')
plt.show()



In [27]: #average price of laptop
 plt.figure(figsize=(15,7))
 sn.barplot(x=df['Inches'],y=df['Price'])
 plt.xticks(rotation='vertical')
 plt.show()



```
In [28]: df['ScreenResolution'].value_counts()
Out[28]: Full HD 1920x1080
                                                           507
         1366x768
                                                           281
         IPS Panel Full HD 1920x1080
                                                           230
         IPS Panel Full HD / Touchscreen 1920x1080
                                                            53
         Full HD / Touchscreen 1920x1080
                                                            47
         1600x900
                                                            23
         Touchscreen 1366x768
                                                            16
         Ouad HD+ / Touchscreen 3200x1800
                                                            15
         IPS Panel 4K Ultra HD 3840x2160
                                                            12
         IPS Panel 4K Ultra HD / Touchscreen 3840x2160
                                                            11
         4K Ultra HD / Touchscreen 3840x2160
                                                            10
         4K Ultra HD 3840x2160
         Touchscreen 2560x1440
         IPS Panel 1366x768
         IPS Panel Quad HD+ / Touchscreen 3200x1800
         IPS Panel Retina Display 2560x1600
         IPS Panel Retina Display 2304x1440
         Touchscreen 2256x1504
         IPS Panel Touchscreen 2560x1440
         IPS Panel Retina Display 2880x1800
         IPS Panel Touchscreen 1920x1200
         1440x900
         IPS Panel 2560x1440
         IPS Panel Quad HD+ 2560x1440
         Quad HD+ 3200x1800
         1920x1080
         Touchscreen 2400x1600
         2560x1440
         IPS Panel Touchscreen 1366x768
         IPS Panel Touchscreen / 4K Ultra HD 3840x2160
         IPS Panel Full HD 2160x1440
         IPS Panel Quad HD+ 3200x1800
         IPS Panel Retina Display 2736x1824
         IPS Panel Full HD 1920x1200
         IPS Panel Full HD 2560x1440
         IPS Panel Full HD 1366x768
         Touchscreen / Full HD 1920x1080
         Touchscreen / Ouad HD+ 3200x1800
         Touchscreen / 4K Ultra HD 3840x2160
         IPS Panel Touchscreen 2400x1600
```

Name: ScreenResolution, dtype: int64

```
Out[30]: <AxesSubplot:xlabel='touchscreen', ylabel='count'>

1000
800
400
200
0
touchscreen

In [31]: sn.barplot(x=df['touchscreen'],y=df['Price'])
```

Out[31]: <AxesSubplot:xlabel='touchscreen', ylabel='Price'>

touchscreen

yword will result in an error or misinterpretation.

In [30]: sn.countplot(df['touchscreen'])

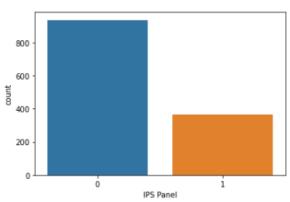
warnings.warn(

In [29]: df['touchscreen']=df['ScreenResolution'].apply(lambda element:1 if 'Touchscreen' in element else 0)

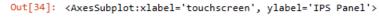
C:\Users\basha\anaconda3\lib\site-packages\seaborn\\_decorators.py:36: FutureWarning: Pass the following variable as a keyword a rg: x. From version 0.12, the only valid positional argument will be `data`, and passing other arguments without an explicit ke

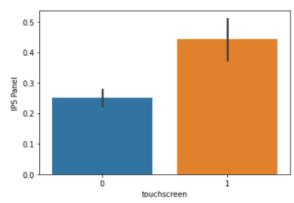
```
In [32]: df['IPS Panel']=df['ScreenResolution'].apply(lambda element:1 if 'IPS Panel' in element else 0)
In [33]: sn.countplot(df['IPS Panel'])
C:\Users\basha\anaconda3\lib\site-packages\seaborn\_decorators.py:36: FutureWarning: Pass the following variable as a keyword a rg: x. From version 0.12, the only valid positional argument will be `data`, and passing other arguments without an explicit ke yword will result in an error or misinterpretation.
    warnings.warn(
```

Out[33]: <AxesSubplot:xlabel='IPS Panel', ylabel='count'>









Out[35]:																
				0	1											
	0	IPS P	anel Retina Di	splay 2560	1600											
	1			1440	900											
	2				1080											
	3		anel Retina Di		1800											
	4	IPS P	anel Retina Di	splay 2560	1600											
	1298	IPS Panel Ful			1080											
	1299	IPS Panel Quad	HD+ / Touchs		1800											
	1300			1366	768											
	1301			1366	768											
	1302			1366	768											
	ui [ i	res']=splitdf														
In [37]:	df.he	ad()														
	df.he	ad()														
In [37]: Out[37]:		ad() ompany TypeNa		ScreenRe	esolution	Сри	Ram	Memory	Gpu	OpSys	Weight	Price	touchscreen	IPS Panel	Xres	
		.,	me Inches		nel Retina	Cpu Intel Core i5 2.3GHz	Ram 8	Memory 128GB SSD	Gpu Intel Iris Plus Graphics 640	OpSys macOS		Price 71378.6832	touchscreen 0	IPS Panel	Xres  IPS Panel Retina Display 2560	
	Co	ompany TypeNa	me Inches	IPS Par Display 2	nel Retina	Intel Core i5		128GB	Intel Iris Plus Graphics	macOS				Panel	IPS Panel Retina Display	

```
In [38]: #findall(r"(\d+\.?\d+)"): The findall function is being used with a regular expression pattern as its argument.
#The pattern r"(\d+\.?\d+)" is used to match numerical values in the input string. Here's a breakdown of the pattern:
#\d+: Matches one or more digits.
#\.?: Matches an optional decimal point (the backslash is used to escape the special meaning of the dot).
#\d+: Matches one or more digits after the decimal point.
#The parentheses () are used to create a capturing group, which allows accessing the matched value later.

df['Xres']=df['Xres'].str.replace(',','').str.findall(r"(\d+\.?\d+)").apply(lambda x:x[0])
```

In [39]: df.head()

in [59]: di.nead(

Out[39]:																
		Company	TypeName	Inches	ScreenResolution	Cpu	Ram	Memory	Gpu	OpSys	Weight	Price	touchscreen	IPS Panel	Xres	Yres
	0	Apple	Ultrabook	13.3	IPS Panel Retina Display 2560x1600	Intel Core i5 2.3GHz	8	128GB SSD	Intel Iris Plus Graphics 640	macOS	1.37	71378.6832	0	1	2560	1600
	1	Apple	Ultrabook	13.3	1440x900	Intel Core i5 1.8GHz	8	128GB Flash Storage	Intel HD Graphics 6000	macOS	1.34	47895.5232	0	0	1440	900
	2	НР	Notebook	15.6	Full HD 1920x1080	Intel Core i5 7200U 2.5GHz	8	256GB SSD	Intel HD Graphics 620	No OS	1.86	30636.0000	0	0	1920	1080
	3	Apple	Ultrabook	15.4	IPS Panel Retina Display 2880x1800	Intel Core i7 2.7GHz	16	512GB SSD	AMD Radeon Pro 455	macOS	1.83	135195.3360	0	1	2880	1800
	4	Apple	Ultrabook	13.3	IPS Panel Retina Display 2560x1600	Intel Core i5 3.1GHz	8	256GB SSD	Intel Iris Plus Graphics 650	macOS	1.37	96095.8080	0	1	2560	1600

In [40]: df['Xres']=df['Xres'].astype('int')
df['Yres']=df['Yres'].astype('int')

```
Out[42]: <AxesSubplot:>
                                                                                                                                 -1.0
                Inches
                                                   0.83
                                                                           -0.36
                                                                                                                                 - 0.8
                                       1
                 Ram
                                                               0.74
                                                                                                                                 - 0.6
                                                    1
                          0.83
               Weight
                                                                1
                 Price
                                      0.74
                                                                                                                                  - 0.4
                                                                             1
           touchscreen
                                                                                                                                  - 0.2
              IPS Panel
                                                                                                                                  - 0.0
                                                                                                     1
                                                                                                                0.99
                         -0.071
                 Xres.
                                                                                                                                  --0.2
                          -0.095
                                                  -0.054
                                                                                                    0.99
                                                                                                                  1
                  Yres
                                                                                                    Xres
                         Inches
                                                  Weight
                                                                                      IPS Panel
                                      Ram
                                                               Price
                                                                         touchscreen
                                                                                                                 Yres
          #we found multi collinearity Xres & Yres
          #pixel per inch
          #PPI is calculated by dividing the number of pixels in the horizontal and vertical directions of a screen by the screen's physical
          #The formula to calculate PPI is:
          PPI = V(Pixel width^2 + Pixel height^2) / Screen size in inches
```

df['PPI']=(((df['Xres']\*\*2+df['Yres']\*\*2))\*0.5/df['Inches']).astype('float')

In [42]:

plt.figure(figsize=(15,7))

sn.heatmap(df.corr(),annot=True,cmap='plasma')

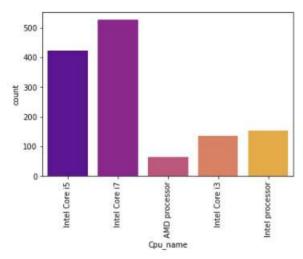
Out[45]:		orr()['F	rice']											
	Inch	es	0.06819	7										
	Ram		0.74300											
	Weig	ht	0.21037											
	Pric	•	1.00000											
		hscreen												
		Panel	0.25220	_										
	Xres		0.55652											
	Yres		0.55280	_										
	PPI		0.48001											
		. Price	, dtype: fl											
In [46]:	df.d			mn as we get PPI ','Yres','Inches			inches							
	u	200()												
Out[46]:	(	Company	TypeName	ScreenResolution	Сри	Ram	Memory	Gpu	OpSys	Weight	Price	touchscreen	IPS Panel	
													railei	
	0	Apple	Ultrabook	IPS Panel Retina	Intel Core i5	_	420AB							
				Display 2560x1600	2.3GHz	8	128GB SSD	Intel Iris Plus Graphics	macOS	1.37	71378.6832	0	1	342616.541
				Display 2560x1600	2.3GHz	8	SSD	Graphics 640	macOS	1.37	71378.6832	0	1	342616.54
		Annia			2.3GHz Intel Core i5		SSD 128GB	Graphics 640 Intel HD						
	1	Apple	Ultrabook	Display 2560x1600		8	SSD 128GB Flash	Graphics 640 Intel HD Graphics		1.37	71378.6832 47895.5232	0		
	1	Apple			Intel Core i5 1.8GHz		SSD 128GB	Graphics 640 Intel HD Graphics 6000						
			Ultrabook	1440×900	Intel Core i5 1.8GHz Intel Core i5	8	SSD 128GB Flash Storage 256GB	Graphics 640 Intel HD Graphics 6000 Intel HD	macOS	1.34	47895.5232	0	0	108406.01
	1	Apple HP			Intel Core i5 1.8GHz		SSD 128GB Flash Storage	Graphics 640 Intel HD Graphics 6000	macOS				0	108406.01
			Ultrabook	1440x900 Full HD 1920x1080	Intel Core i5 1.8GHz Intel Core i5 7200U 2.5GHz	8	SSD 128GB Flash Storage 256GB SSD	Graphics 640 Intel HD Graphics 6000 Intel HD Graphics 620	macOS	1.34	47895.5232	0	0	342616.541 108406.015 155538.461
		НР	Ultrabook	1440x900  Full HD 1920x1080  IPS Panel Retina	Intel Core i5 1.8GHz Intel Core i5 7200U 2.5GHz Intel Core i7	8	SSD  128GB Flash Storage  256GB SSD  512GB	Graphics 640 Intel HD Graphics 6000 Intel HD Graphics	macOS No OS	1.34	47895.5232	0	0	108406.01
	2		Ultrabook	1440x900 Full HD 1920x1080	Intel Core i5 1.8GHz Intel Core i5 7200U 2.5GHz	8	SSD 128GB Flash Storage 256GB SSD	Graphics 640 Intel HD Graphics 6000 Intel HD Graphics 620	macOS No OS	1.34	47895.5232 30636.0000	0	0	108406.015 155538.46
	2	НР	Ultrabook	1440x900  Full HD 1920x1080  IPS Panel Retina	Intel Core i5 1.8GHz Intel Core i5 7200U 2.5GHz Intel Core i7	8	SSD  128GB Flash Storage  256GB SSD  512GB	Graphics 640 Intel HD Graphics 6000 Intel HD Graphics 620 AMD Radeon Pro	macOS No OS	1.34	47895.5232 30636.0000	0	0	108406.015 155538.46

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2.7GHz SSD Pro 455  Intel Iris  4 Apple Ultrabook Display 2560x1600 3.1GHz SSD Graphics SSD Graphics SSD Graphics	]: [	Cc 0	ompany  Apple  Apple	TypeName  Ultrabook  Ultrabook	ScreenResolution  IPS Panel Retina Display 2560x1600  1440x900	Cpu Intel Core i5 2.3GHz Intel Core i5 1.8GHz Intel Core i5 7200U	Ram 8	Memory  128GB SSD  128GB Flash Storage	Gpu Intel Iris Plus Graphics 640 Intel HD Graphics 6000 Intel HD Graphics	Op Sys macOS	1.37	71378.6832 47895.5232	0	Panel 1	342616.541353 108406.015038	Intel Core i5 Intel Core i5
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650	]: [	0 1 2 3	Apple Apple Apple Apple	TypeName  Ultrabook  Ultrabook  Notebook  Ultrabook	ScreenResolution  IPS Panel Retina Display 2560x1600  1440x900  Full HD 1920x1080  IPS Panel Retina Display 2880x1800	Cpu Intel Core i5 2.3GHz Intel Core i5 1.8GHz Intel Core i5 7200U 2.5GHz Intel Core i7 2.7GHz Intel	Ram 8 8 8 16	Memory  128GB SSD  128GB Flash Storage  256GB SSD  512GB SSD	Gpu Intel Iris Plus Graphics 640 Intel HD Graphics 6000 Intel HD Graphics 620 AMD Radeon Pro 455 Intel Iris	OpSys macOS macOS No OS macOS	1.37 1.34 1.86	71378.6832 47895.5232 30636.0000 135195.3360	0 0 0	1 0 0 1 1	342616.541353 108406.015038 155538.461538 374493.506494	Intel Core i5 Intel Core i5 Intel Core i5
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[50]: df	f['Cp	u_name	e']												
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df rt[51]: 0	Con  1  2	Apple  Apple	return'AM ']=df['Cp TypeName  Ultrabook  Ultrabook  Notebook	D processor' u_name'].apply(] ScreenResolution  IPS Panel Retina Display 2560x1600  1440x900  Full HD 1920x1080  IPS Panel Retina	Cpu  Intel Core i5 2.3GHz  Intel Core i5 1.8GHz  Intel Core i5 7200U 2.5GHz  Intel Core i7	Ram 8 8	Memory  128GB SSD  128GB Flash Storage  256GB SSD	Gpu  Intel Iris Plus Graphics 640  Intel HD Graphics 6000  Intel HD Graphics 620  AMD Radeon	Op Sys macOS macOS	1.37 1.34 1.86	71378.6832 47895.5232 30636.0000	0 0	Panel  1  0	342616.541353 108406.015038 155538.461538 374493.506494	Intel Co

In [52]: sn.countplot(df['Cpu\_name'],palette='plasma')
 plt.xticks(rotation='vertical')

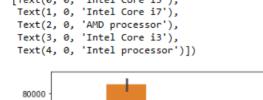
C:\Users\basha\anaconda3\lib\site-packages\seaborn\\_decorators.py:36: FutureWarning: Pass the following variable as a keyword a
 rg: x. From version 0.12, the only valid positional argument will be `data`, and passing other arguments without an explicit ke
 yword will result in an error or misinterpretation.
 warnings.warn(



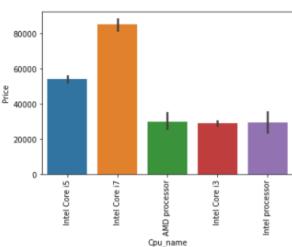
sn.barplot(df['Cpu\_name'],df['Price'])
plt.xticks(rotation='vertical')

C:\Users\basha\anaconda3\lib\site-packages\seaborn\\_decorators.py:36: FutureWarning: Pass the following variables as keyword ar
gs: x, y. From version 0.12, the only valid positional argument will be `data`, and passing other arguments without an explicit
keyword will result in an error or misinterpretation.
 warnings.warn(

Out[53]: (array([0, 1, 2, 3, 4]),
 [Text(0, 0, 'Intel Core i5'),



In [53]: #price vs process variation



In [54]: df.drop(columns=['Cpu'],inplace=True)
 df.head()

O	ut	۲5	4

	٠	neda()												
t[54]:		Company	TypeName	ScreenResolution	Ram	Memory	Gpu	OpSys	Weight	Price	touchscreen	IPS Panel	PPI	Cpu_name
	0	Apple	Ultrabook	IPS Panel Retina Display 2560x1600	8	128GB SSD	Intel Iris Plus Graphics 640	macOS	1.37	71378.6832	0	1	342616.541353	Intel Core i5
	1	Apple	Ultrabook	1440x900	8	128GB Flash Storage	Intel HD Graphics 6000	macOS	1.34	47895.5232	0	0	108406.015038	Intel Core i5
	2	НР	Notebook	Full HD 1920x1080	8	256GB SSD	Intel HD Graphics 620	No OS	1.86	30636.0000	0	0	155538.461538	Intel Core i5

```
df['Ram'].unique()
Out[55]: array([ 8, 16, 4, 2, 12, 6, 32, 24, 64])
```

In [55]: #Analysis on RAM column

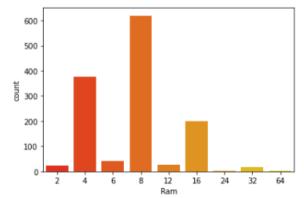
In [56]: sn.countplot(df['Ram'],palette='autumn')

```
# sn.countplot(df['Ram'],palette='autumn')
# sn.countplot(df['Cpu_name'],palette='plasma')
# plt.xticks(rotation='vertical')
```

C:\Users\basha\anaconda3\lib\site-packages\seaborn\\_decorators.py:36: FutureWarning: Pass the following variable as a keyword a rg: x. From version 0.12, the only valid positional argument will be `data`, and passing other arguments without an explicit ke yword will result in an error or misinterpretation.

warnings.warn(

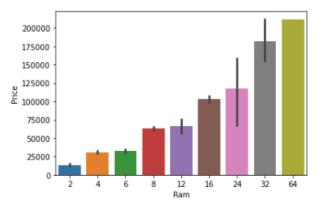
Out[56]: <AxesSubplot:xlabel='Ram', ylabel='count'>



```
In [57]: sn.barplot(df['Ram'],df['Price'])

C:\Users\basha\anaconda3\lib\site-packages\seaborn\_decorators.py:36: FutureWarning: Pass the following variables as keyword ar
gs: x, y. From version 0.12, the only valid positional argument will be `data`, and passing other arguments without an explicit
keyword will result in an error or misinterpretation.
warnings.warn(
```

### Out[57]: <AxesSubplot:xlabel='Ram', ylabel='Price'>



```
In [58]: #Memory column
    df['Memory'].unique()
```

```
In [59]: df['Memory'].value counts()
Out[59]: 256GB SSD
                                           412
         1TB HDD
                                           223
         500GB HDD
                                           132
         512GB SSD
                                           118
         128GB SSD + 1TB HDD
                                            94
         128GB SSD
                                            76
         256GB SSD + 1TB HDD
                                            73
         32GB Flash Storage
                                            38
                                            16
         2TB HDD
         64GB Flash Storage
                                            15
         512GB SSD + 1TB HDD
                                            14
         1TB SSD
                                            14
         256GB SSD + 2TB HDD
                                            10
         1.0TB Hybrid
                                             9
         256GB Flash Storage
                                             8
         16GB Flash Storage
                                             7
         32GB SSD
         180GB SSD
         128GB Flash Storage
         512GB SSD + 2TB HDD
         16GB SSD
                                             3
         512GB Flash Storage
         1TB SSD + 1TB HDD
         256GB SSD + 500GB HDD
         128GB SSD + 2TB HDD
         256GB SSD + 256GB SSD
                                             2
         512GB SSD + 256GB SSD
         512GB SSD + 512GB SSD
         64GB Flash Storage + 1TB HDD
         1TB HDD + 1TB HDD
         32GB HDD
         64GB SSD
         128GB HDD
         240GB SSD
         8GB SSD
         508GB Hybrid
         1.0TB HDD
         512GB SSD + 1.0TB Hybrid
                                             1
         256GB SSD + 1.0TB Hybrid
                                             1
         Name: Memory, dtype: int64
In [60]: df['Memory']=df['Memory'].astype(str).replace('\.0',"",regex=True) #whatever comes after decimal is truncated
```

```
In [61]: df['Memory']=df['Memory'].str.replace('GB'," ")
         df['Memory']=df['Memory'].str.replace('TB',"000")
In [62]: df['Memory'].value counts()
Out[62]: 256 SSD
                                         412
         1000 HDD
                                         224
         500 HDD
                                         132
         512 SSD
                                         118
         128 SSD + 1000 HDD
                                         94
         128 SSD
                                         76
                                         73
         256 SSD + 1000 HDD
         32 Flash Storage
                                         38
         2000 HDD
                                         16
         64 Flash Storage
                                         15
         512 SSD + 1000 HDD
                                         14
         1000 SSD
                                         14
         256 SSD + 2000 HDD
                                         10
         1000 Hybrid
                                          9
         256 Flash Storage
         16 Flash Storage
                                          7
         32 SSD
         180 SSD
         128 Flash Storage
         512 SSD + 2000 HDD
                                           3
         16 SSD
         512 Flash Storage
                                           2
         1000 SSD + 1000 HDD
                                           2
         256 SSD + 500 HDD
                                           2
         128 SSD + 2000 HDD
                                           2
         256 SSD + 256 SSD
         512 SSD + 256 SSD
                                          1
         512 SSD + 512 SSD
                                           1
         64 Flash Storage + 1000 HDD
         1000 HDD + 1000 HDD
                                          1
         32 HDD
         64 SSD
         128 HDD
                                           1
         240 SSD
                                          1
         8 SSD
                                          1
         508 Hybrid
                                          1
         512 SSD + 1000 Hybrid
                                          1
         256 SSD + 1000 Hybrid
                                          1
         Name: Memory, dtype: int64
```

In [63]:	#now	split	the word	accros	s the "+"	chara	cter									
	new_df	f=df['	Memory']	.str.sp	olit('+',ex	pand=	True,n=1	)								
In [64]:	new_df	f														
Out[64]:																
000[04].			0	1												
	0		128 SSD	None												
	1	128 Fla	sh Storage	None												
	2		256 SSD	None												
	3		512 SSD	None												
	4		256 SSD	None												
	1298		128 SSD	None												
	1299		512 SSD	None												
	1300	64 Fla	sh Storage	None												
	1301		1000 HDD	None												
	1302		500 HDD	None												
	1303 r	ows × 2	2 columns													
	df['fi		=new_df[(	0].str.	strip()											
Out[65]:			T N			D		C	0-6	W-:	Deire	4	IPS	pp.	C	5:4
		mpany	TypeName	Scree	enResolution	Kam	метогу	Gpu	OpSys	weight	Price	touchscreen	Panel	PPI	Cpu_name	first
	0	Apple	Ultrabook	IPS Displa	Panel Retina ay 2560x1600	8	128 SSD	Intel Iris Plus Graphics 640	macOS	1.37	71378.6832	0	1	342616.541353	Intel Core i5	128 SSD
	1	Apple	Ultrabook	(	1440x900	8	128 Flash Storage	Intel HD Graphics 6000	macOS	1.34	47895.5232	0	0	108406.015038	Intel Core i5	128 Flash Storage
	2	НР	Notebook	c Full H	ID 1920x1080	8	256 SSD	Intel HD Graphics 620	No OS	1.86	30636.0000	0	0	155538.461538	Intel Core i5	256 SSD
	3	Apple	Ultrabook		Panel Retina ay 2880x1800	16	512 SSD	AMD Radeon Pro 455	macOS	1.83	135195.3360	0	1	374493.506494	Intel Core i7	512 SSD

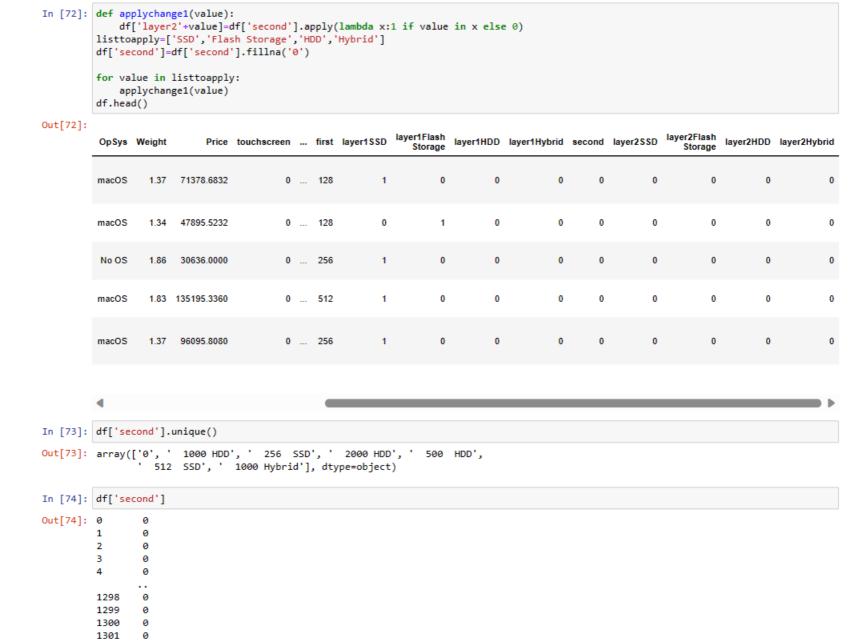
```
Out[66]: array(['128 SSD', '128 Flash Storage', '256 SSD', '512 SSD',
                  '500 HDD', '256 Flash Storage', '1000 HDD', '32 Flash Storage',
                  '64 Flash Storage', '32 SSD', '2000 HDD', '64 SSD',
                  '1000 Hybrid', '1000 SSD', '16 SSD', '16 Flash Storage',
                  '180 SSD', '32 HDD', '512 Flash Storage', '128 HDD',
                  '240 SSD', '8 SSD', '508 Hybrid'], dtype=object)
In [67]: def applychange(value):
              df['layer1'+value]=df['first'].apply(lambda x:1 if value in x else 0)
          listtoapply=['SSD', 'Flash Storage', 'HDD', 'Hybrid']
          for value in listtoapply:
              applychange(value)
          df.head()
Out[67]:
                                                                                                                     layer1Flash
                                                                                                      first layer1SSD
                                                                                                                                layer1HDD layer1Hybrid
         Ram Memory
                          Gpu OpSys Weight
                                                    Price touchscreen
                                                                                     PPI Cpu name
                                                                     Panel
                                                                                                                         Storage
                        Intel Iris
                  128
                          Plus
                                                                                           Intel Core
                                                                                                       128
                                              71378.6832
                                                                         1 342616.541353
                                                                                                                              0
                                                                                                                                        0
                                                                                                                                                    0
            8
                               macOS
                                         1.37
                                                                                                      SSD
                  SSD
                      Graphics
                           640
                   128
                       Intel HD
                                                                                                       128
                                                                                           Intel Core
                                                                                                                   0
                                                                                                                              1
                                                                                                                                        0
                                                                   0
                                                                         0 108406.015038
                                                                                                     Flash
                                                                                                                                                    0
                 Flash
                       Graphics
                               macOS
                                         1.34
                                               47895.5232
               Storage
                          6000
                                                                                                    Storage
                        Intel HD
                  256
                                                                                           Intel Core
                                                                                                       256
                                                                         0 155538.461538
            8
                       Graphics
                                No OS
                                         1.86
                                               30636.0000
                                                                   0
                                                                                                                   1
                                                                                                                              0
                                                                                                                                        0
                                                                                                                                                    0
                  SSD
                                                                                                      SSD
                           620
                          AMD
                  512
                                                                                           Intel Core
                                                                                                       512
           16
                                         1.83 135195.3360
                                                                   0
                                                                         1 374493.506494
                                                                                                                              0
                                                                                                                                        0
                                                                                                                                                    0
                        Radeon
                               macOS
                  SSD
                                                                                                      SSD
                        Pro 455
                        Intel Iris
                  256
                                                                                           Intel Core
                                                                                                       256
            8
                               macOS
                                         1.37
                                               96095.8080
                                                                         1 342616.541353
                                                                                                                              0
                                                                                                                                        0
                  SSD
                      Graphics
                                                                                                      SSD
In [68]: #In first column we will remove all text and keep numbers
          df['first']=df['first'].str.replace('\D','')
          df['first'].value counts()
          C:\Users\basha\AppData\Local\Temp\ipykernel 30028\2715463296.py:3: FutureWarning: The default value of regex will change from T
          rue to False in a future version.
            df['first']=df['first'].str.replace('\D','')
Out[68]: 256
                   508
                   250
```

In [66]: df['first'].unique()

1000 128

177

t[69]:																
			0 1													
	0	128 SS	) None													
	1	128 Flash Storag	None													
	2	256 SS	) None													
	3		) None													
	4	256 SS	) None													
	1298	128 SS	) None													
	1299	512 SSI	) None													
	1300	64 Flash Storag	None													
	1301	1000 HDI	None													
			Mana													
	1302 1303 rd	500 HDI ows × 2 column														
[70]:	1303 rd	ows × 2 column	s													
[70]:	df['se	ows × 2 column	s f[1]		Ram	Memory	Gpu	OpSys	Weight	Price	touchscreen	IPS Panel	PPI	Cpu_name	first	lay
[70]:	df['se	ows × 2 column econd']=new_d ad()	f[1] ne Scre		Ram 8	128	Intel Iris Plus	OpSys macOS		Price 71378.6832	touchscreen 0	Panel	PPI 342616.541353	l=1-1.0		lay
[70]:	df['sedf.hea	ows × 2 column econd']=new_d ad() empany TypeNar	s f[1] me Scre	eenResolution S Panel Retina Display		128	Intel Iris Plus Graphics	macOS	1.37			Panel			128	lay
[70]:	df['sedf.hea	ows × 2 column econd']=new_d ad() empany TypeNar Apple Ultrabo	s  f[1]  me Scre  IPS  ok	eenResolution S Panel Retina Display 2560x1600	8	128 SSD 128 Flash	Intel Iris Plus Graphics 640 Intel HD Graphics	macOS	1.37	71378.6832	0	Panel 1	342616.541353	Intel Core i5 Intel Core i5	128	lay
[70]:	df['sedf.hea	ows × 2 column econd']=new_d ad() empany TypeNar Apple Ultrabo Apple Ultrabo	s  f[1]  ne Scre  IPS  ok	S Panel Retina Display 2560x1600 1440x900	8	128 SSD 128 Flash Storage	Intel Iris Plus Graphics 640 Intel HD Graphics 6000 Intel HD Graphics	macOS macOS No OS	1.37 1.34 1.86	71378.6832 47895.5232	0	Panel  1  0	342616.541353 108406.015038	Intel Core i5 Intel Core i5	128 128 256	lay



			]=df['seco ].value_co	ond'].str.repla ounts()	ce('\	D',"")											
	rue	to False	e in a fut	ta\Local\Temp\i ture version. econd'].str.rep		_		62679.p	y:1: Fu	tureWarning	g: The defa	ult	valu	e of rege	c will cha	nge from	Т
Out[75]:	1000 2000 256 500 512	1!	7	int64													
	df['			rst'].astype('i econd'].astype(		)											
Out[76]:	c	Company	TypeName	ScreenResolution	Ram	Memory	Gpu	OpSys	Weight	Price	touchscreen		first	layer1SSD	layer1Flash Storage	layer1HD	D la
	0	Apple	Ultrabook	IPS Panel Retina Display 2560x1600	8	128 SSD	Intel Iris Plus Graphics 640	macOS	1.37	71378.6832	0		128	1	0		0
	1	Apple	Ultrabook	1440x900	8	128 Flash Storage	Intel HD Graphics 6000	macOS	1.34	47895.5232	0		128	0	1		0
	2	НР	Notebook	Full HD 1920x1080	8	256 SSD	Intel HD Graphics 620	No OS	1.86	30636.0000	0		256	1	0		0
	3	Apple	Ultrabook	IPS Panel Retina Display 2880x1800	16	512 SSD	AMD Radeon Pro 455	macOS	1.83	135195.3360	0		512	1	0		0
	4	Apple	Ultrabook	IPS Panel Retina Display 2560x1600	8	256 SSD	Intel Iris Plus Graphics 650	macOS	1.37	96095.8080	0		256	1	0		0

```
In [80]: #drop unnecesary columns
           df.drop(columns=['first', 'layer1SSD', 'layer1Flash Storage', 'layer1HDD',
                   'layer1Hybrid', 'second', 'layer2SSD', 'layer2Flash Storage',
                   'layer2HDD', 'layer2Hybrid'],inplace=True)
In [81]: df.sample(5)
Out[81]:
                                                                                                                                                  Flash
                                                                                                                     PPI Cpu_name SSD HDD
          TypeName ScreenResolution Ram Memory
                                                        Gpu
                                                               OpSys Weight
                                                                                  Price touchscreen
                                                                                                                                                         Hybrid
                                                                                                     Panel
                                                                                                                                                Storage
                             Full HD /
                                                     Intel HD
                                               256
              2 in 1
                                                             Windows
                                                                                                                           Intel Core
                                                                                                                                     256
                          Touchscreen
                                                    Graphics
                                                                         1.28 90576.000
                                                                                                         0 182436.090226
                                                                                                                                             0
                                                                                                                                                      0
                                                                                                                                                             0
                                               SSD
                                                                   10
          Convertible
                           1920x1080
                                                        620
                                                       AMD
                                               256
                                                              Windows
                                                                                                                               AMD
           Notebook
                            1366x768
                                                     Radeon
                                                                         2.10 24029.280
                                                                                                            78710.897436
                                                                                                                                     256
                                                                                                                                             0
                                                                                                                                                      0
                                               SSD
                                                                   10
                                                                                                                           processor
                                                         R5
                                                     Intel HD
                                              1000
                                                                                                                           Intel Core
           Notebook
                            1366x768
                                                    Graphics
                                                               No OS
                                                                         1.90 26101.872
                                                                                                  0
                                                                                                         0 78710.897436
                                                                                                                                       0
                                                                                                                                          1000
                                                                                                                                                      0
                                                                                                                                                             0
                                              HDD
                                                        620
                                                      Nvidia
                     IPS Panel Full HD
                                              1000
                                                              Windows
                                                                                                                           Intel Core
                                                                                                                                          1000
           Notebook
                                         8
                                                                         2.50 48697.920
                                                                                                  0
                                                                                                         1 140254.335260
                                                                                                                                       0
                                                                                                                                                      0
                                                    GeForce
                           1920x1080
                                              HDD
                                                                   10
                                                      930MX
                                                     Intel HD
              2 in 1
                          Touchscreen
                                           64 Flash
                                                              Chrome
                                                                                                                                Intel
                                                                                                                                                     64
                                                    Graphics
                                                                         1.40 26373.600
                                                                                                         0 105852.586207
                                                                                                                                       0
                                                                                                                                             0
          Convertible
                            1366x768
                                            Storage
                                                                  OS
                                                                                                                           processor
In [82]: df.corr()['Price']
Out[82]: Ram
                              0.743007
           Weight
                              0.210370
           Price
                              1.000000
                              0.191226
           touchscreen
           IPS Panel
                              0.252208
           PPI
                              0.480017
           SSD
                              0.670799
           HDD
                             -0.096441
           Flash Storage
                             -0.040511
           Hybrid
                              0.007989
           Name: Price, dtype: float64
```

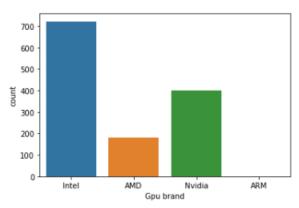
In [83]: df.drop(columns=['Hybrid','Flash Storage'],inplace=True)

GPU

```
In [86]: df['Gpu'].value_counts()
Out[86]: Intel HD Graphics 620
                                    281
         Intel HD Graphics 520
                                    185
         Intel UHD Graphics 620
                                     68
         Nvidia GeForce GTX 1050
                                     66
         Nvidia GeForce GTX 1060
                                     48
         AMD Radeon R5 520
         AMD Radeon R7
         Intel HD Graphics 540
         AMD Radeon 540
         ARM Mali T860 MP4
         Name: Gpu, Length: 110, dtype: int64
In [92]: for i in df['Gpu'].unique():
             print(i.split()[0])
         Intel
         Intel
         Intel
         AMD
         Intel
         AMD
         Intel
         Nvidia
         Intel
         Intel
         AMD
         AMD
         Intel
         AMD
         Nvidia
         Intel
         Nvidia
         AMD
         AMD
```

Out[93]: <AxesSubplot:xlabel='Gpu brand', ylabel='count'>

warnings.warn(

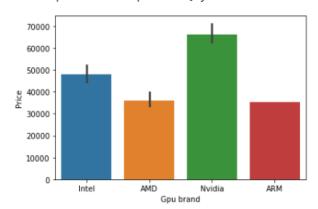


In [96]: sn.barplot(df['Gpu brand'],df['Price'],estimator=np.median)

C:\Users\basha\anaconda3\lib\site-packages\seaborn\\_decorators.py:36: FutureWarning: Pass the following variables as keyword args: x, y. From version 0.12, the only valid positional argument will be `data`, and passing other arguments without an explicit keyword will result in an error or misinterpretation.

warnings.warn(

Out[96]: <AxesSubplot:xlabel='Gpu brand', ylabel='Price'>



OPS

```
In [102]: df['OpSys'].value_counts()
```

Out[102]: Windows 10 1072 No 05 66 Linux 62 Windows 7 45 Chrome OS 27 macOS 13 Mac OS X Windows 10 S 8 Android

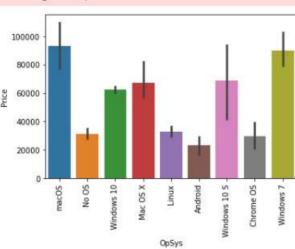
Name: OpSys, dtype: int64

```
In [104]: sn.barplot(df['OpSys'],df['Price'])
plt.xticks(rotation='vertical')
```

plt.show()

C:\Users\basha\anaconda3\lib\site-packages\seaborn\\_decorators.py:36: FutureWarning: Pass the following variables as keyword ar gs: x, y. From version 0.12, the only valid positional argument will be `data`, and passing other arguments without an explicit keyword will result in an error or misinterpretation.

warnings.warn(



```
In [105]: df['OpSys'].unique()
```

Out[105]: array(['macOS', 'No OS', 'Windows 10', 'Mac OS X', 'Linux', 'Android', 'Windows 10 S', 'Chrome OS', 'Windows 7'], dtype=object)

```
In [106]:
    def club(text):
        if text=='Windows 10 S' or text =='Windows 10' or text == 'Windows 7':
            return 'Windows'
        elif text=='macOS' or text=='Mac OS X' :
            return 'Mac'
        else:
            return 'Other'
    df['OpSys']=df['OpSys'].apply(lambda x:club(x))
    df.head()
```

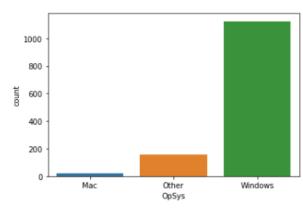
### Out[106]:

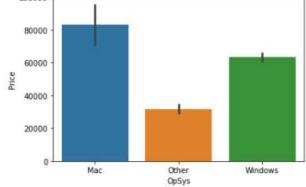
	Company	TypeName	Ram	OpSys	Weight	Price	touchscreen	IPS Panel	PPI	Cpu_name	SSD	HDD	Gpu brand
0	Apple	Ultrabook	8	Mac	1.37	71378.6832	0	1	342616.541353	Intel Core i5	128	0	Intel
1	Apple	Ultrabook	8	Mac	1.34	47895.5232	0	0	108406.015038	Intel Core i5	0	0	Intel
2	HP	Notebook	8	Other	1.86	30636.0000	0	0	155538.461538	Intel Core i5	256	0	Intel
3	Apple	Ultrabook	16	Mac	1.83	135195.3360	0	1	374493.506494	Intel Core i7	512	0	AMD
4	Apple	Ultrabook	8	Mac	1.37	96095.8080	0	1	342616.541353	Intel Core i5	256	0	Intel

# In [107]: sn.countplot(df['OpSys'])

C:\Users\basha\anaconda3\lib\site-packages\seaborn\\_decorators.py:36: FutureWarning: Pass the following variable as a keyword a rg: x. From version 0.12, the only valid positional argument will be `data`, and passing other arguments without an explicit ke yword will result in an error or misinterpretation.
warnings.warn(

# Out[107]: <AxesSubplot:xlabel='OpSys', ylabel='count'>



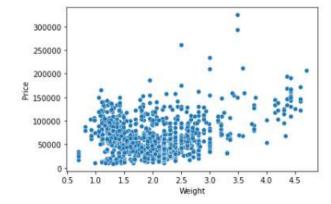


weight Analysis

```
In [110]: sn.scatterplot(df['Weight'],df['Price'])
```

C:\Users\basha\anaconda3\lib\site-packages\seaborn\\_decorators.py:36: FutureWarning: Pass the following variables as keyword ar gs: x, y. From version 0.12, the only valid positional argument will be `data`, and passing other arguments without an explicit keyword will result in an error or misinterpretation.
warnings.warn(

# Out[110]: <AxesSubplot:xlabel='Weight', ylabel='Price'>



```
In [113]:
            plt.figure(figsize=(15,7))
            sn.heatmap(df.corr(),annot=True,cmap='plasma')
Out[113]: <AxesSubplot:>
                                                                                                                                      -10
                   Ram
                                                     0.74
                                                                                                                                      - 0.8
                 Weight -
                                                                                                                                      - 0.6
                  Price
                            0.74
                                                      1
                                                                                                        0.67
                                                                                                                                      - 0.4
             touchscreen
               IPS Panel
                                                                                1
                                                                                                                                      - 0.2
                    PPI
                                                                                                                                      - 0.0
                   SSD
                                                     0.67
                                                                                                         1
                                                                                                                                      --0.2
                   HDD -
                                                     Price
                                                                                            PPI
                                                                                                        SSD
                            Ram
                                        Weight
                                                                             IPS Panel
                                                                                                                     HDD
                                                               touchscreen
```