Apple ipad pricing analysis

**Data set:-**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Product** | **Price** | **Screen** | **Capacity** | **Connectivity** | **Gen** |
| 16GB Wifi Mini 2 | 279 | Mini | 16GB | Wifi | Previous |
| 32GB Wifi Mini 2 | 379 | Mini | 32GB | Wifi | Previous |
| 16GB Wifi Mini 4 | 399 | Mini | 16GB | Wifi | Current |
| 16GB Wifi Air | 399 | Air | 16GB | Wifi | Previous |
| 16GB Wifi Mini 2 | 409 | Mini | 16GB | Wifi | Previous |
| 64GB Wifi Mini 4 | 499 | Mini | 64GB | Wifi | Current |
| 32GB Wifi Air | 499 | Air | 32 GB | Wifi | Previous |
| 16GB Wifi Air 2 | 499 | Air | 16GB | Wifi | Current |
| 16GB Cellular Mini 4 | 529 | Mini | 16GB | Cellular | Current |
| 16GB Cellular Air | 529 | Air | 16GB | Cellular | Previous |
| 128GB Wifi Mini 4 | 599 | Mini | 128GB | Wifi | Current |
| 64 GB Wifi 2 | 599 | Wifi | 64GB | wifi | current |
| 3263 Cellular Mini 2 | 609 | Mini | 32GB | Cellular | Previous |
| 64GB Cellular Mini 4 | 629 | Mini | 6463 | Cellular | Current |
| 32GB Cellular Air | 629 | Air | 32GB | Cellular | Previous |
| 16GB Cellular Air 2 | 629 | Air | 16GB | Cellular | Current |
| 128GB Wifi Air 2 | 699 | Air | 128GB | Wifi | Current |
| 128GB Cellular Mini 4 | 729 | Mini | 128GB | Cellular | Current |
| 64GB Cellular Air 2 | 729 | Air | 64GB | Cellular | Current |
| 32GB Wifi Pro | 799 | Pro | 32GB | Wifi | Current |
| 128GB Cellular Air 2 | 829 | Air | 128GB | Cellular | Current |
| 128GB Wifi Pro | 949 | Pro | 128GB | Wifi | Current |
| 128 GB Cellular pro | 1079 | Cellular | 128GB | Cellular | Current |

**Multiple resgression model**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Regression Statistics* | |  |  |  |  |  |  |  |
| Multiple R | 0.964867746 |  |  |  |  |  |  |  |
| R Square | 0.930969768 |  |  |  |  |  |  |  |
| Adjusted R Square | 0.915629717 |  |  |  |  |  |  |  |
| Standard Error | 55.32456193 |  |  |  |  |  |  |  |
| Observations | 23 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 4 | 743027.2104 | 185756.8 | 60.68882924 | 3.33809E-10 |  |  |  |
| Residual | 18 | 55094.52874 | 3060.807 |  |  |  |  |  |
| Total | 22 | 798121.7391 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 90.8615058 | 35.79076373 | 2.538686 | 0.020580592 | 15.66790145 | 166.0551102 | 15.66790145 | 166.0551102 |
| Screen | 144.9641763 | 17.35894383 | 8.350979 | 1.32254E-07 | 108.4943886 | 181.433964 | 108.4943886 | 181.433964 |
| Capacity | 73.77041469 | 11.36572055 | 6.490606 | 4.192E-06 | 49.89192187 | 97.6489075 | 49.89192187 | 97.6489075 |
| Connectivity | 126.7642873 | 23.43831941 | 5.408421 | 3.86917E-05 | 77.52220544 | 176.0063691 | 77.52220544 | 176.0063691 |
| Gen | 62.15581502 | 28.43913985 | 2.185573 | 0.042306164 | 2.407399308 | 121.9042307 | 2.407399308 | 121.9042307 |

Analysis:-

**Multiple R: -** here multiple R talks about the correlation between two variable that means here price is **96%** depend on rest all independent variable

**R Square:-** here higher (**93%**) R Square values represent smaller differences between the observed data and the fitted values. Here **93%** R Square is showing The data point is very close to regression line that means a very low noise in the data which seems fantastic.

**Adjusted R Square:-** here Adjusted R-square is **91%** which indicates that there are new terms improving in the model that means here overspecified model is more likely to reduce the precision of coefficient estimates and predicted values. You don’t want to include more terms in the model then necessary.

**Standard Error:-** Here standard error is **55%** that indicates here prediction is quite more that means the model is having more dust which is estimation if standard error will be less than it will indicate that model is good(less dust is there).

**Sum of square:-** sum of square talks aboutthe distance between each data point and the line of best fit is squared and then summed up.

So here the distance between actual and predictable values is **743027** which result indicates

A large degree of variability within the data set.

**Mean square :-** Here mean square is obtained by dividing the term sum of square by the degree of freedom.

So here treatment mean square, it indicates represent the variation is **185756** between the sample means.

**Codded data:-**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Price** | **Screen** | **Capacity** | **Connectivity** | **Gen** |
| 279 | 1 | 1 | 0 | 0 |
| 379 | 1 | 2 | 0 | 0 |
| 399 | 1 | 1 | 0 | 1 |
| 399 | 2 | 1 | 0 | 0 |
| 409 | 1 | 1 | 0 | 0 |
| 499 | 1 | 3 | 0 | 1 |
| 499 | 2 | 2 | 0 | 0 |
| 499 | 2 | 1 | 0 | 1 |
| 529 | 1 | 1 | 1 | 1 |
| 529 | 2 | 1 | 1 | 0 |
| 599 | 1 | 4 | 0 | 1 |
| 599 | 2 | 3 | 0 | 1 |
| 609 | 1 | 2 | 1 | 0 |
| 629 | 1 | 3 | 1 | 1 |
| 629 | 2 | 2 | 1 | 0 |
| 629 | 2 | 1 | 1 | 1 |
| 699 | 2 | 4 | 0 | 1 |
| 729 | 1 | 4 | 1 | 1 |
| 729 | 2 | 3 | 1 | 1 |
| 799 | 3 | 2 | 0 | 1 |
| 829 | 2 | 4 | 1 | 1 |
| 949 | 3 | 4 | 0 | 1 |
| 1079 | 3 | 4 | 1 | 1 |

**Question solve in python:-**

**Q1- Design the product with all advanced fetures and predict the price?**

data = [['3','4','1','1']]

df2 = pd.DataFrame(data, columns = ['Screen','Capacity', 'Connectivity', 'Gen'])

df2

**output:-**

|  | **Screen** | **Capacity** | **Connectivity** | **Gen** |
| --- | --- | --- | --- | --- |
|  | 3 | 4 | 1 | 1 |

df2\_pred = reg.predict(df2)

print(df2\_pred)

output:- [1009.75579572]

so if you take high all advanced features **[3,4,1,1]** price will be Rs.**1009**

**Q2- Design another product with chepeast price possible?**

print(df.min())

**output:-**

| **Screen** | **Capacity** | **Connectivity** | **Gen** |
| --- | --- | --- | --- |

1 1 0 0

Price 279

**Q3- if for the target price is the $400 what best product can be design? List the features.**

df\_out[df\_out['Pred\_Price'] < 400]

**output:-**

| **Screen** | **Capacity** | **Connectivity** | **Gen** |
| --- | --- | --- | --- |

1 2 1 0