

TASK 3:Car Prediction ML

OUTPUT:

Car Names:

['ritz' 'sx4' 'ciaz' 'wagon r' 'swift' 'vitara brezza' 'ciaz' 's cross'
'ciaz' 'ciaz' 'alto 800' 'ciaz' 'ciaz' 'ertiga' 'dzire' 'ertiga' 'ertiga'
'ertiga' 'wagon r' 'sx4' 'alto k10' 'ignis' 'sx4' 'alto k10' 'wagon r'
'swift' 'swift' 'swift' 'alto k10' 'ciaz' 'ritz' 'ritz' 'swift' 'ertiga'
'dzire' 'sx4' 'dzire' '800' 'alto k10' 'sx4' 'baleno' 'alto k10' 'sx4'
'dzire' 'omni' 'ciaz' 'ritz' 'wagon r' 'ertiga' 'ciaz' 'fortuner'
'fortuner' 'innova' 'fortuner' 'innova' 'corolla altis' 'etios cross'
'corolla altis' 'etios g' 'fortuner' 'corolla altis' 'etios cross'
'fortuner' 'fortuner' 'fortuner' 'etios liva' 'innova' 'fortuner'
'corolla altis' 'corolla altis' 'etios liva' 'corolla altis'
'corolla altis' 'etios liva' 'etios cross' 'etios g' 'corolla altis'
'corolla' 'corolla altis' 'fortuner' 'corolla altis' 'etios gd' 'innova'
'innova' 'innova' 'camry' 'land cruiser' 'corolla altis' 'etios liva'
'etios g' 'corolla altis' 'innova' 'innova' 'fortuner' 'corolla altis'
'corolla altis' 'innova' 'corolla altis' 'corolla altis' 'fortuner'
'Royal Enfield Thunder 500' 'UM Renegade Mojave' 'KTM RC200'
'Bajaj Dominar 400' 'Royal Enfield Classic 350' 'KTM RC390'
'Hyosung GT250R' 'Royal Enfield Thunder 350' 'Royal Enfield Thunder 350'
'Royal Enfield Classic 350' 'KTM RC200' 'Royal Enfield Thunder 350'
'KTM 390 Duke ' 'Mahindra Mojo XT300' 'Royal Enfield Classic 350'
'Royal Enfield Classic 350' 'Royal Enfield Classic 350'
'Royal Enfield Thunder 500' 'Royal Enfield Classic 350'
'Royal Enfield Thunder 500' 'Bajaj Pulsar RS200'
'Royal Enfield Thunder 350' 'Royal Enfield Bullet 350'
'Royal Enfield Classic 350' 'Royal Enfield Classic 500'
'Royal Enfield Classic 500' 'Bajaj Avenger 220' 'Bajaj Avenger 150'
'Honda CB Hornet 160R' 'Yamaha FZ S V 2.0' 'Honda CB Hornet 160R'

'Yamaha FZ 16' 'Bajaj Avenger 220' 'Bajaj Avenger 220'

'TVS Apache RTR 160' 'Bajaj Pulsar 150' 'Honda CBR 150' 'Hero Extreme'

'Honda CB Hornet 160R' 'Bajaj Avenger 220 dtsi' 'Honda CBR 150'

'Bajaj Avenger 150 street' 'Yamaha FZ v 2.0' 'Yamaha FZ v 2.0'

'Bajaj Pulsar NS 200' 'TVS Apache RTR 160' 'Hero Extreme'

'Yamaha FZ S V 2.0' 'Bajaj Pulsar 220 F' 'Bajaj Pulsar 220 F'

'TVS Apache RTR 180' 'Hero Passion X pro' 'Bajaj Pulsar NS 200'

'Bajaj Pulsar NS 200' 'Yamaha Fazer ' 'Honda Activa 4G' 'TVS Sport '

'Yamaha FZ S V 2.0' 'Honda Dream Yuga ' 'Honda Activa 4G'

'Bajaj Avenger Street 220' 'TVS Apache RTR 180' 'Bajaj Pulsar NS 200'

'Bajaj Avenger 220 dtsi' 'Hero Splender iSmart' 'Activa 3g'

'Hero Passion Pro' 'TVS Apache RTR 160' 'Honda CB Trigger'

'Hero Splender iSmart' 'Yamaha FZ S ' 'Hero Passion Pro'

'Bajaj Pulsar 135 LS' 'Activa 4g' 'Honda CB Unicorn'

'Hero Honda CBZ extreme' 'Honda Karizma' 'Honda Activa 125' 'TVS Jupyter'

'Honda Karizma' 'Hero Honda Passion Pro' 'Hero Splender Plus'

'Honda CB Shine' 'Bajaj Discover 100' 'Bajaj Pulsar 150'

'Suzuki Access 125' 'TVS Wego' 'Honda CB twister' 'Hero Glamour'

'Hero Super Splendor' 'Bajaj Pulsar 150' 'Bajaj Discover 125' 'Hero Hunk'

'Hero Ignitor Disc' 'Hero CBZ Xtreme' 'Bajaj ct 100' 'Activa 3g'

'Honda CB twister' 'Bajaj Discover 125' 'Honda CB Shine'

'Bajaj Pulsar 150' 'i20' 'grand i10' 'i10' 'eon' 'grand i10' 'xcent'

'grand i10' 'i20' 'grand i10' 'i10' 'elantra' 'creta' 'i20' 'grand i10'

'verna' 'eon' 'eon' 'verna' 'verna' 'eon' 'i20' 'i20' 'verna' 'verna'

'i10' 'grand i10' 'i10' 'verna' 'i20' 'verna' 'verna' 'elantra'

'grand i10' 'grand i10' 'verna' 'eon' 'creta' 'verna' 'eon' 'verna'

'xcent' 'xcent' 'i20' 'verna' 'verna' 'i20' 'verna' 'i10' 'i20' 'creta'

'city' 'brio' 'city' 'city' 'brio' 'city' 'city' 'city' 'amaze' 'city'

'brio' 'amaze' 'jazz' 'amaze' 'jazz' 'amaze' 'city' 'brio' 'city' 'city'

'city' 'city' 'jazz' 'brio' 'city' 'city' 'city' 'jazz' 'city' 'brio'

'city' 'city' 'city' 'brio' 'jazz' 'jazz' 'amaze' 'city' 'city' 'amaze'

'brio' 'jazz' 'city' 'amaze' 'city' 'city' 'brio' 'city' 'city' 'brio']

Manufacturing Year:

[2014 2013 2017 2011 2014 2018 2015 2015 2016 2015 2017 2015 2015 2015
2009 2016 2015 2016 2015 2010 2016 2017 2011 2014 2013 2011 2013 2017
2010 2015 2012 2011 2014 2014 2014 2011 2015 2003 2016 2003 2016 2014
2008 2014 2012 2014 2013 2006 2015 2017 2012 2015 2017 2013 2005 2009
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2014 2016 2017 2015 2011 2009 2015 2010 2014 2016 2015 2015 2016 2014
2015 2006 2014 2016 2013 2016 2016 2015 2015 2016 2014 2015 2016 2010
2014 2015 2016 2015 2009 2017 2016]

Selling Price:

[3.35 4.75 7.25 2.85 4.6 9.25 6.75 6.5 8.75 7.45 2.85 6.85
7.5 6.1 2.25 7.75 7.25 7.75 3.25 2.65 2.85 4.9 4.4 2.5
2.9 3. 4.15 6. 1.95 7.45 3.1 2.35 4.95 6. 5.5 2.95
4.65 0.35 3. 2.25 5.85 2.55 1.95 5.5 1.25 7.5 2.65 1.05
5.8 7.75 14.9 23. 18. 16. 2.75 3.6 4.5 4.75 4.1 19.99
6.95 4.5 18.75 23.5 33. 4.75 19.75 9.25 4.35 14.25 3.95 4.5

7.45 2.65 4.9 3.95 5.5 1.5 5.25 14.5 14.73 4.75 23. 12.5
 3.49 2.5 35. 5.9 3.45 4.75 3.8 11.25 3.51 23. 4. 5.85
 20.75 17. 7.05 9.65 1.75 1.7 1.65 1.45 1.35 1.35 1.35 1.25
 1.2 1.2 1.2 1.15 1.15 1.15 1.15 1.11 1.1 1.1 1.1 1.05
 1.05 1.05 1.05 1. 0.95 0.9 0.9 0.75 0.8 0.78 0.75 0.75
 0.75 0.72 0.65 0.65 0.65 0.65 0.6 0.6 0.6 0.6 0.6 0.6
 0.6 0.6 0.55 0.55 0.52 0.51 0.5 0.5 0.5 0.5 0.5 0.48
 0.48 0.48 0.48 0.45 0.45 0.45 0.45 0.45 0.45 0.45 0.45 0.42
 0.42 0.4 0.4 0.4 0.4 0.4 0.38 0.38 0.35 0.35 0.35 0.31
 0.3 0.3 0.3 0.27 0.25 0.25 0.25 0.25 0.25 0.2 0.2 0.2
 0.2 0.2 0.2 0.18 0.17 0.16 0.15 0.12 0.1 3.25 4.4 2.95
 2.75 5.25 5.75 5.15 7.9 4.85 3.1 11.75 11.25 2.9 5.25 4.5
 2.9 3.15 6.45 4.5 3.5 4.5 6. 8.25 5.11 2.7 5.25 2.55
 4.95 3.1 6.15 9.25 11.45 3.9 5.5 9.1 3.1 11.25 4.8 2.
 5.35 4.75 4.4 6.25 5.95 5.2 3.75 5.95 4. 5.25 12.9 5.
 5.4 7.2 5.25 3. 10.25 8.5 8.4 3.9 9.15 5.5 4. 6.6
 4. 6.5 3.65 8.35 4.8 6.7 4.1 3. 7.5 2.25 5.3 10.9
 8.65 9.7 6. 6.25 5.25 2.1 8.25 8.99 3.5 7.4 5.65 5.75
 8.4 10.11 4.5 5.4 6.4 3.25 3.75 8.55 9.5 4. 3.35 11.5
 5.3]

Present Price:

[5.59 9.54 9.85 4.15 6.87 9.83 8.12 8.61 8.89 8.92
 3.6 10.38 9.94 7.71 7.21 10.79 10.79 10.79 5.09 7.98
 3.95 5.71 8.01 3.46 4.41 4.99 5.87 6.49 3.95 10.38
 5.98 4.89 7.49 9.95 8.06 7.74 7.2 2.28 3.76 7.98
 7.87 3.98 7.15 8.06 2.69 12.04 4.89 4.15 7.71 9.29
 30.61 30.61 19.77 30.61 10.21 15.04 7.27 18.54 6.8 35.96
 18.61 7.7 35.96 35.96 36.23 6.95 23.15 20.45 13.74 20.91
 6.76 12.48 18.61 5.71 8.93 6.8 14.68 12.35 22.83 30.61
 14.89 7.85 25.39 13.46 13.46 23.73 92.6 13.74 6.05 6.76
 18.61 16.09 13.7 30.61 22.78 18.61 25.39 18.64 18.61 20.45

1.9 1.82 1.78 1.6 1.47 2.37 3.45 1.5 1.5 1.47
1.78 1.5 2.4 1.4 1.47 1.47 1.47 1.9 1.47 1.9
1.26 1.5 1.17 1.47 1.75 1.75 0.95 0.8 0.87 0.84
0.87 0.82 0.95 0.95 0.81 0.74 1.2 0.787 0.87 0.95
1.2 0.8 0.84 0.84 0.99 0.81 0.787 0.84 0.94 0.94
0.826 0.55 0.99 0.99 0.88 0.51 0.52 0.84 0.54 0.51
0.95 0.826 0.99 0.95 0.54 0.54 0.55 0.81 0.73 0.54
0.83 0.55 0.64 0.51 0.72 0.787 1.05 0.57 0.52 1.05
0.51 0.48 0.58 0.47 0.75 0.58 0.52 0.51 0.57 0.57
0.75 0.57 0.75 0.65 0.787 0.32 0.52 0.51 0.57 0.58
0.75 6.79 5.7 4.6 4.43 5.7 7.13 5.7 8.1 5.7
4.6 14.79 13.6 6.79 5.7 9.4 4.43 4.43 8.4 9.4
5.43 6.79 7.6 9.4 9.4 4.6 5.7 4.43 9.4 6.79
9.4 9.4 14.79 5.7 5.7 9.4 4.43 13.6 9.4 4.43
9.4 7.13 7.13 7.6 9.4 9.4 6.79 9.4 4.6 7.6
13.6 9.9 6.82 9.9 9.9 5.35 13.6 13.6 13.6 7.
13.6 5.97 5.8 7.7 7. 8.7 7. 9.4 5.8 10.
10. 10. 10. 7.5 6.8 13.6 13.6 13.6 8.4 13.6
5.9 7.6 14. 11.8 5.9 8.5 7.9 7.5 13.6 13.6
6.4 6.1 8.4 9.9 6.8 13.09 11.6 5.9 11. 12.5
5.9]

Kilometers Driven:

[27000 43000 6900 5200 42450 2071 18796 33429 20273 42367
2135 51000 15000 26000 77427 43000 41678 43000 35500 41442
25000 2400 50000 45280 56879 20000 55138 16200 44542 45000
51439 54200 39000 45000 45000 49998 48767 127000 10079 62000
24524 46706 58000 45780 50000 15000 64532 65000 25870 37000
104707 40000 15000 135000 90000 70000 40534 50000 39485 41000
40001 40588 78000 47000 6000 45000 11000 59000 88000 12000
71000 45000 56001 43000 83000 36000 72000 135154 80000 89000
23000 40000 15000 38000 197176 142000 78000 56000 47000 40000

62000 58242 75000 40000 89000 72000 29000 8700 45000 50024
3000 1400 4000 1200 4100 21700 16500 15000 18000 11000
6000 8700 7000 35000 17000 17500 33000 14000 26000 5400
5700 6900 6000 46500 11500 40000 1300 7000 3000 5000
11000 18000 3500 500 11800 5000 23500 16000 15000 16600
32000 20000 29000 25000 25000 19000 15000 58000 45000 24000
6000 31000 13000 45000 8000 4300 15000 23000 8600 4000
24000 23000 14500 27000 14000 500 1000 42000 12000 14000
5500 6700 13700 1300 38600 75000 30000 24000 19000 213000
60000 50000 30000 21000 26000 1900 22000 32000 18000 55000
60000 25000 49000 24000 50000 35000 500000 33000 35000 53000
92233 58000 28200 53460 28282 3493 12479 34797 3435 21125
35775 43535 22671 31604 20114 36100 12500 15000 45078 36000
38488 32000 77632 61381 36198 22517 24678 57000 60000 52132
45000 15001 12900 53000 4492 15141 11849 68000 60241 23709
32322 35866 34000 7000 49000 71000 35000 36000 30000 17000
35934 56701 31427 48000 54242 53675 49562 40324 25000 36054
29223 5600 40023 16002 40026 21200 35000 19434 19000 18828
69341 69562 27600 61203 16500 30753 24800 21780 4000 40126
14465 50456 63000 9010 9800 15059 28569 44000 34000 10980
19000 31427 12000 38000 33019 60076 33988 60000 87934 9000
5464]

Fuel Type:

['Petrol' 'Diesel' 'Petrol' 'Petrol' 'Diesel' 'Diesel' 'Petrol' 'Diesel'
'Diesel' 'Diesel' 'Petrol' 'Diesel' 'Petrol' 'Petrol' 'Petrol' 'Diesel'
'Diesel' 'Diesel' 'CNG' 'Petrol' 'Petrol' 'Petrol' 'Petrol' 'Petrol'
'Petrol' 'Petrol' 'Petrol' 'Petrol' 'Petrol' 'Diesel' 'Diesel' 'Petrol'
'Diesel' 'Diesel' 'Diesel' 'CNG' 'Petrol' 'Petrol' 'Petrol' 'Petrol'
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'Petrol' 'Petrol' 'Petrol' 'Diesel' 'Petrol' 'Petrol' 'Diesel' 'Diesel']

[illegible]

Selling Type:

[illegible]

'Individual' 'Individual' 'Individual' 'Individual' 'Individual'

'Individual' 'Dealer' 'Dealer' 'Dealer' 'Dealer' 'Dealer' 'Dealer'

'Dealer' 'Dealer' 'Dealer' 'Dealer' 'Dealer' 'Dealer' 'Dealer' 'Dealer'

'Dealer' 'Dealer' 'Dealer' 'Dealer' 'Dealer' 'Dealer' 'Dealer' 'Dealer'

'Dealer' 'Dealer' 'Dealer' 'Dealer' 'Dealer' 'Dealer' 'Dealer' 'Dealer'

'Dealer' 'Dealer' 'Dealer' 'Dealer' 'Dealer' 'Dealer' 'Dealer' 'Dealer'

'Dealer' 'Dealer' 'Dealer' 'Dealer' 'Dealer' 'Dealer' 'Dealer' 'Dealer'

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'Dealer' 'Dealer' 'Dealer' 'Dealer' 'Dealer' 'Dealer']
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[ 'Manual' 'Manual' 'Manual' 'Manual' 'Manual' 'Manual' 'Manual' 'Manual'
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'Manual' 'Automatic' 'Automatic' 'Manual' 'Automatic' 'Manual' 'Manual'

Owner Count:

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[0000000000000000000000000000000000000000000000000  
0000000000000000000000000000000000000000000000000  
0000000000000000000000000000000000000000000000000
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True True True True True True True True True True True True True
True True True True True True True True True True True True True
True]

Manufacturing Year >= 2015: [False False True False False True True True True True True True True

True True False True True True True False True True False False
False False False True False True False False False False False False
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True True False True True False False True True True False True
True]

Selling Price == 3: [False False False False False False False False False False False False

False False False False False False False False False False False

2.9 2.82 2.78 2.6 2.47 3.37 4.45 2.5 2.5 2.47
 2.78 2.5 3.4 2.4 2.47 2.47 2.47 2.9 2.47 2.9
 2.26 2.5 2.17 2.47 2.75 2.75 1.95 1.8 1.87 1.84
 1.87 1.82 1.95 1.95 1.81 1.74 2.2 1.787 1.87 1.95
 2.2 1.8 1.84 1.84 1.99 1.81 1.787 1.84 1.94 1.94
 1.826 1.55 1.99 1.99 1.88 1.51 1.52 1.84 1.54 1.51
 1.95 1.826 1.99 1.95 1.54 1.54 1.55 1.81 1.73 1.54
 1.83 1.55 1.64 1.51 1.72 1.787 2.05 1.57 1.52 2.05
 1.51 1.48 1.58 1.47 1.75 1.58 1.52 1.51 1.57 1.57
 1.75 1.57 1.75 1.65 1.787 1.32 1.52 1.51 1.57 1.58
 1.75 7.79 6.7 5.6 5.43 6.7 8.13 6.7 9.1 6.7
 5.6 15.79 14.6 7.79 6.7 10.4 5.43 5.43 9.4 10.4
 6.43 7.79 8.6 10.4 10.4 5.6 6.7 5.43 10.4 7.79
 10.4 10.4 15.79 6.7 6.7 10.4 5.43 14.6 10.4 5.43
 10.4 8.13 8.13 8.6 10.4 10.4 7.79 10.4 5.6 8.6
 14.6 10.9 7.82 10.9 10.9 6.35 14.6 14.6 14.6 8.
 14.6 6.97 6.8 8.7 8. 9.7 8. 10.4 6.8 11.
 11. 11. 11. 8.5 7.8 14.6 14.6 14.6 9.4 14.6
 6.9 8.6 15. 12.8 6.9 9.5 8.9 8.5 14.6 14.6
 7.4 7.1 9.4 10.9 7.8 14.09 12.6 6.9 12. 13.5
 6.9]

Multiplying Driven KMs by 2:

[54000 86000 13800 10400 84900 4142 37592 66858 40546
 84734 4270 102000 30000 52000 154854 86000 83356 86000
 71000 82884 50000 4800 100000 90560 113758 40000 110276
 32400 89084 90000 102878 108400 78000 90000 90000 99996
 97534 254000 20158 124000 49048 93412 116000 91560 100000
 30000 129064 130000 51740 74000 209414 80000 30000 270000
 180000 140000 81068 100000 78970 82000 80002 81176 156000
 94000 12000 90000 22000 118000 176000 24000 142000 90000
 112002 86000 166000 72000 144000 270308 160000 178000 46000

80000 30000 76000 394352 284000 156000 112000 94000 80000
 124000 116484 150000 80000 178000 144000 58000 17400 90000
 100048 6000 2800 8000 2400 8200 43400 33000 30000
 36000 22000 12000 17400 14000 70000 34000 35000 66000
 28000 52000 10800 11400 13800 12000 93000 23000 80000
 2600 14000 6000 10000 22000 36000 7000 1000 23600
 10000 47000 32000 30000 33200 64000 40000 58000 50000
 50000 38000 30000 116000 90000 48000 12000 62000 26000
 90000 16000 8600 30000 46000 17200 8000 48000 46000
 29000 54000 28000 1000 2000 84000 24000 28000 11000
 13400 27400 2600 77200 150000 60000 48000 38000 426000
 120000 100000 60000 42000 52000 3800 44000 64000 36000
 110000 120000 50000 98000 48000 100000 70000 1000000 66000
 70000 106000 184466 116000 56400 106920 56564 6986 24958
 69594 6870 42250 71550 87070 45342 63208 40228 72200
 25000 30000 90156 72000 76976 64000 155264 122762 72396
 45034 49356 114000 120000 104264 90000 30002 25800 106000
 8984 30282 23698 136000 120482 47418 64644 71732 68000
 14000 98000 142000 70000 72000 60000 34000 71868 113402
 62854 96000 108484 107350 99124 80648 50000 72108 58446
 11200 80046 32004 80052 42400 70000 38868 38000 37656
 138682 139124 55200 122406 33000 61506 49600 43560 8000
 80252 28930 100912 126000 18020 19600 30118 57138 88000
 68000 21960 38000 62854 24000 76000 66038 120152 67976
 120000 175868 18000 10928]

Selecting Selling Price values greater than 3:

[3.35 4.75 7.25 4.6 9.25 6.75 6.5 8.75 7.45 6.85 7.5 6.1
 7.75 7.25 7.75 3.25 4.9 4.4 4.15 6. 7.45 3.1 4.95 6.
 5.5 4.65 5.85 5.5 7.5 5.8 7.75 14.9 23. 18. 16. 3.6
 4.5 4.75 4.1 19.99 6.95 4.5 18.75 23.5 33. 4.75 19.75 9.25
 4.35 14.25 3.95 4.5 7.45 4.9 3.95 5.5 5.25 14.5 14.73 4.75

23. 12.5 3.49 35. 5.9 3.45 4.75 3.8 11.25 3.51 23. 4.
 5.85 20.75 17. 7.05 9.65 3.25 4.4 5.25 5.75 5.15 7.9 4.85
 3.1 11.75 11.25 5.25 4.5 3.15 6.45 4.5 3.5 4.5 6. 8.25
 5.11 5.25 4.95 3.1 6.15 9.25 11.45 3.9 5.5 9.1 3.1 11.25
 4.8 5.35 4.75 4.4 6.25 5.95 5.2 3.75 5.95 4. 5.25 12.9
 5. 5.4 7.2 5.25 10.25 8.5 8.4 3.9 9.15 5.5 4. 6.6
 4. 6.5 3.65 8.35 4.8 6.7 4.1 7.5 5.3 10.9 8.65 9.7
 6. 6.25 5.25 8.25 8.99 3.5 7.4 5.65 5.75 8.4 10.11 4.5
 5.4 6.4 3.25 3.75 8.55 9.5 4. 3.35 11.5 5.3]

Randomly selected car data:

Car_Name	Year	Selling_Price	Present_Price	Driven_kms	Fuel_Type	Selling_type	Transmission	Owner
21 ignis	2017	4.90	5.71	2400	Petrol	Dealer	Manual	0
210 i10	2012	3.10	4.60	35775	Petrol	Dealer	Manual	0
136 Honda CBR 150	2014	0.65	1.20	23500	Petrol	Individual	Manual	0
19 sx4	2010	2.65	7.98	41442	Petrol	Dealer	Manual	0
76 corolla altis	2013	5.50	14.68	72000	Petrol	Dealer	Manual	0

Vector of 40 evenly spaced values between min and max of Selling Price:

[0.1 0.99487179 1.88974359 2.78461538 3.67948718 4.57435897
 5.46923077 6.36410256 7.25897436 8.15384615 9.04871795 9.94358974
 10.83846154 11.73333333 12.62820513 13.52307692 14.41794872 15.31282051
 16.20769231 17.1025641 17.9974359 18.89230769 19.78717949 20.68205128
 21.57692308 22.47179487 23.36666667 24.26153846 25.15641026 26.05128205
 26.94615385 27.84102564 28.73589744 29.63076923 30.52564103 31.42051282
 32.31538462 33.21025641 34.10512821 35.]

Original Selling Price range: [0.1 , 35.0]

Vector of 40 evenly spaced normalized values between 0 and 1:

[0. 0.02564103 0.05128205 0.07692308 0.1025641 0.12820513
 0.15384615 0.17948718 0.20512821 0.23076923 0.25641026 0.28205128
 0.30769231 0.33333333 0.35897436 0.38461538 0.41025641 0.43589744
 0.46153846 0.48717949 0.51282051 0.53846154 0.56410256 0.58974359

```
0.61538462 0.64102564 0.66666667 0.69230769 0.71794872 0.74358974
0.76923077 0.79487179 0.82051282 0.84615385 0.87179487 0.8974359
0.92307692 0.94871795 0.97435897 1.    ]
```

Present Price DataFrame:

```
Present_Price
0      5.59
1      9.54
2      9.85
3      4.15
4      6.87
..      ...
296    11.60
297     5.90
298    11.00
299    12.50
300     5.90
```

[301 rows x 1 columns]

Selling Price DataFrame:

```
Selling_Price
0      3.35
1      4.75
2      7.25
3      2.85
4      4.60
..      ...
296     9.50
297     4.00
298     3.35
299    11.50
```

300 5.30

[301 rows x 1 columns]

Joined DataFrame:

	Present_Price	Selling_Price
0	5.59	3.35
1	9.54	4.75
2	9.85	7.25
3	4.15	2.85
4	6.87	4.60
..
296	11.60	9.50
297	5.90	4.00
298	11.00	3.35
299	12.50	11.50
300	5.90	5.30

[301 rows x 2 columns]

Pivot table - Average Selling Price by Present Price:

Selling_Price	Present_Price
0.32	0.180000
0.47	0.270000
0.48	0.300000
0.51	0.340000
0.52	0.312500
...	...
25.39	21.875000
30.61	18.280000
35.96	20.746667
36.23	33.000000

92.60 35.000000

[148 rows x 1 columns]

Rows swapped in reverse order:

	Car_Name	Year	Selling_Price	Present_Price	Driven_kms	Fuel_Type	Selling_type	Transmission	Owner	
	Present_Price_Range									
300	brio	2016	5.30	5.90	5464	Petrol	Dealer	Manual	0	5-10
299	city	2017	11.50	12.50	9000	Diesel	Dealer	Manual	0	10-15
298	city	2009	3.35	11.00	87934	Petrol	Dealer	Manual	0	10-15
297	brio	2015	4.00	5.90	60000	Petrol	Dealer	Manual	0	5-10
296	city	2016	9.50	11.60	33988	Diesel	Dealer	Manual	0	10-15
..
4	swift	2014	4.60	6.87	42450	Diesel	Dealer	Manual	0	5-10
3	wagon r	2011	2.85	4.15	5200	Petrol	Dealer	Manual	0	Below 5
2	ciaz	2017	7.25	9.85	6900	Petrol	Dealer	Manual	0	5-10
1	sx4	2013	4.75	9.54	43000	Diesel	Dealer	Manual	0	5-10
0	ritz	2014	3.35	5.59	27000	Petrol	Dealer	Manual	0	5-10

[301 rows x 10 columns]

Columns swapped in reverse order:

	Present_Price_Range	Owner	Transmission	Selling_type	Fuel_Type	Driven_kms	Present_Price	Selling_Price	Year	Car_Name
0	5-10	0	Manual	Dealer	Petrol	27000	5.59	3.35	2014	ritz
1	5-10	0	Manual	Dealer	Diesel	43000	9.54	4.75	2013	sx4
2	5-10	0	Manual	Dealer	Petrol	6900	9.85	7.25	2017	ciaz
3	Below 5	0	Manual	Dealer	Petrol	5200	4.15	2.85	2011	wagon r
4	5-10	0	Manual	Dealer	Diesel	42450	6.87	4.60	2014	swift
..
296	10-15	0	Manual	Dealer	Diesel	33988	11.60	9.50	2016	city
297	5-10	0	Manual	Dealer	Petrol	60000	5.90	4.00	2015	brio
298	10-15	0	Manual	Dealer	Petrol	87934	11.00	3.35	2009	city

299	10-15	0	Manual	Dealer	Diesel	9000	12.50	11.50	2017	city
300	5-10	0	Manual	Dealer	Petrol	5464	5.90	5.30	2016	brio

[301 rows x 10 columns]

Both rows and columns swapped in reverse order:

	Present_Price_Range	Owner	Transmission	Selling_type	Fuel_Type	Driven_kms	Present_Price	Selling_Price	Year	Car_Name
300	5-10	0	Manual	Dealer	Petrol	5464	5.90	5.30	2016	brio
299	10-15	0	Manual	Dealer	Diesel	9000	12.50	11.50	2017	city
298	10-15	0	Manual	Dealer	Petrol	87934	11.00	3.35	2009	city
297	5-10	0	Manual	Dealer	Petrol	60000	5.90	4.00	2015	brio
296	10-15	0	Manual	Dealer	Diesel	33988	11.60	9.50	2016	city
..
4	5-10	0	Manual	Dealer	Diesel	42450	6.87	4.60	2014	swift
3	Below 5	0	Manual	Dealer	Petrol	5200	4.15	2.85	2011	wagon r
2	5-10	0	Manual	Dealer	Petrol	6900	9.85	7.25	2017	ciaz
1	5-10	0	Manual	Dealer	Diesel	43000	9.54	4.75	2013	sx4
0	5-10	0	Manual	Dealer	Petrol	27000	5.59	3.35	2014	ritz

[301 rows x 10 columns]

Lowercase:

0	ritz
1	sx4
2	ciaz
3	wagon r
4	swift
...	
296	city
297	brio
298	city

299 city

300 brio

Name: Car_Name_str, Length: 301, dtype: object

Length:

0 4

1 3

2 4

3 7

4 5

..

296 4

297 4

298 4

299 4

300 4

Name: Car_Name_str, Length: 301, dtype: int64

Starts with 'A':

0 False

1 False

2 False

3 False

4 False

...

296 False

297 False

298 False

299 False

300 False

Name: Car_Name_str, Length: 301, dtype: bool

Split:

```
0    [ritz]
1    [sx4]
2    [ciaz]
3    [wagon, r]
4    [swift]
...
296  [city]
297  [brio]
298  [city]
299  [city]
300  [brio]
```

Name: Car_Name_str, Length: 301, dtype: object

Extract first digits or letters:

```
0    ritz
1     sx
2    ciaz
3   wagon
4   swift
...
296  city
297  brio
298  city
299  city
300  brio
```

Name: Car_Name_str, Length: 301, dtype: object

Find patterns that don't start/end with vowels:

```
0    [ritz]
```

```
1    [sx4]
2    [ciaz]
3    [wagon r]
4    [swift]
...
296  [city]
297  []
298  [city]
299  [city]
300  []
```

Name: Car_Name_str, Length: 301, dtype: object

First 3 characters:

```
0    rit
1    sx4
2    cia
3    wag
4    swi
...
296  cit
297  bri
298  cit
299  cit
300  bri
```

Name: Car_Name_str, Length: 301, dtype: object

Last split element:

```
0    ritz
1    sx4
2    ciaz
3    r
```

4 swift

...

296 city

297 brio

298 city

299 city

300 brio

Name: Car_Name_str, Length: 301, dtype: object

Column: Present_Price

Mean: 7.628471760797343

Median: 6.4

Standard Deviation: 8.628215963588232

Variance: 74.44611071431882

Column: Selling_Price

Mean: 4.661295681063123

Median: 3.6

Standard Deviation: 5.074361323307891

Variance: 25.74914283948301

Column: Driven_kms

Mean: 36947.20598006644

Median: 32000.0

Standard Deviation: 38822.23398884307

Variance: 1507165851.8844824

Sorted Dataset by Selling_Price:

	Car_Name	Year	Selling_Price	Present_Price	Driven_kms
200	Bajaj Pulsar 150	2006	0.10	0.75	92233
199	Honda CB Shine	2007	0.12	0.58	53000
198	Bajaj Discover 125	2011	0.15	0.57	35000

197	Honda CB twister	2010	0.16	0.51	33000
196	Activa 3g	2008	0.17	0.52	500000
..	
93	fortuner	2015	23.00	30.61	40000
51	fortuner	2015	23.00	30.61	40000
63	fortuner	2015	23.50	35.96	47000
64	fortuner	2017	33.00	36.23	6000
86	land cruiser	2010	35.00	92.60	78000

[301 rows x 5 columns]

Missing Values Before Handling:

```
Car_Name      0
Year          0
Selling_Price 0
Present_Price 0
Driven_kms    0
Fuel_Type     0
Selling_type  0
Transmission  0
Owner         0
Present_Price_Range 0
Car_Name_str  0
dtype: int64
```

Missing Values After Handling:

```
Car_Name      0
Year          0
Selling_Price 0
Present_Price 0
Driven_kms    0
```

```
Fuel_Type      0
Selling_type    0
Transmission    0
Owner           0
Present_Price_Range  0
Car_Name_str    0
dtype: int64
```

Filtered Data (Selling_Price > 1000):

Empty DataFrame

Columns: [Car_Name, Year, Selling_Price, Present_Price, Driven_kms, Fuel_Type, Selling_type, Transmission, Owner, Present_Price_Range, Car_Name_str]

Index: []

Numeric columns detected: Index(['Year', 'Selling_Price', 'Present_Price', 'Driven_kms', 'Owner'], dtype='object')

Data After Transformation (Scaling):

	Car_Name	Year	Selling_Price	Present_Price	Driven_kms	...	Selling_type	Transmission	Owner
0	ritz	0.128897	-0.258416	-0.236256	-0.256224	...	Dealer	Manual	-0.174501
5-10	ritz								
1	sx4	-0.217514	0.017481	0.221544	0.155911	...	Dealer	Manual	-0.174501
5-10	sx4								
2	ciaz	1.168129	0.510154	0.257472	-0.773969	...	Dealer	Manual	-0.174501
5-10	ciaz								
3	wagon r	-0.910335	-0.356950	-0.403151	-0.817758	...	Dealer	Manual	-0.174501
Below 5	wagon r								
4	swift	0.128897	-0.012079	-0.087906	0.141743	...	Dealer	Manual	-0.174501
5-10	swift								

[5 rows x 11 columns]

Data Types Before Conversion:

```
Make      object
Model     object
```

Year int64
Price int64
Fuel_Type object
Mileage int64
dtype: object

Data Types After Conversion:

Make category
Model category
Year int64
Price float64
Fuel_Type category
Mileage float64
dtype: object

Modified Dataset:

	Make	Model	Year	Price	Fuel_Type	Mileage
0	Toyota	Corolla	2015	15000.0	Petrol	15.0
1	Honda	Civic	2018	18000.0	Diesel	20.0
2	Ford	Focus	2016	12000.0	Petrol	18.0
3	BMW	X5	2020	35000.0	Diesel	12.0
4	Audi	A4	2017	27000.0	Petrol	16.0

	Car_Name	Year	Selling_Price	Present_Price	Driven_kms	Fuel_Type	Selling_type	Transmission	Owner
--	----------	------	---------------	---------------	------------	-----------	--------------	--------------	-------

0	ritz	2014	3.35	5.59	27000	Petrol	Dealer	Manual	0
1	sx4	2013	4.75	9.54	43000	Diesel	Dealer	Manual	0
2	ciaz	2017	7.25	9.85	6900	Petrol	Dealer	Manual	0
3	wagon r	2011	2.85	4.15	5200	Petrol	Dealer	Manual	0
4	swift	2014	4.60	6.87	42450	Diesel	Dealer	Manual	0

Index(['Car_Name', 'Year', 'Selling_Price', 'Present_Price', 'Driven_kms',
 'Fuel_Type', 'Selling_type', 'Transmission', 'Owner'],

dtype='object')

R-squared (R2) Score: 0.9327750577068049

	Car_Name	Year	Selling_Price	Present_Price	Driven_kms	Fuel_Type	Selling_type	Transmission	Owner
--	----------	------	---------------	---------------	------------	-----------	--------------	--------------	-------

0	ritz	2014	3.35	5.59	27000	Petrol	Dealer	Manual	0
1	sx4	2013	4.75	9.54	43000	Diesel	Dealer	Manual	0
2	ciaz	2017	7.25	9.85	6900	Petrol	Dealer	Manual	0
3	wagon r	2011	2.85	4.15	5200	Petrol	Dealer	Manual	0
4	swift	2014	4.60	6.87	42450	Diesel	Dealer	Manual	0

Index(['Car_Name', 'Year', 'Selling_Price', 'Present_Price', 'Driven_kms',

'Fuel_Type', 'Selling_type', 'Transmission', 'Owner'],

dtype='object')

R-squared (R2) Score: 0.9006829168863724

Predicted Selling Price for 'swift': 5.303668584218146

R-squared (R2) Score: 0.9006829168863724

Predicted Selling Price for 'ritz' (2014): 3.8130240543632006

Predicted Selling Price for 'ritz' (2012): 3.415512008641348

Predicted Selling Price for 'ritz' (2011): 1.5714742917721005

Predicted Selling Price for 'ritz' (2013): 2.701515876121654

R-squared (R2) Score: 0.9006829168863724

Predicted Selling Price for 'swift' (2014): 5.303668584218146

Predicted Selling Price for 'swift' (2011): 1.8974567219522416

Predicted Selling Price for 'swift' (2013): 3.4847635590389285

Predicted Selling Price for 'swift' (2017): 5.2244310399029645

Predicted Selling Price for 'swift' (2014): 5.687092947779012

R-squared (R2) Score: 0.9006829168863724

Predicted Selling Price for 'ciaz' (2017): 8.113539357671598

Predicted Selling Price for 'ciaz' (2015): 5.876731631164555

Predicted Selling Price for 'ciaz' (2016): 7.515679401293989

Predicted Selling Price for 'ciaz' (2015): 6.88892357044057

Predicted Selling Price for 'ciaz' (2015): 7.742772183418642

Predicted Selling Price for 'ciaz' (2015): 7.293259881281946

Predicted Selling Price for 'ciaz' (2015): 7.760336193917239

Predicted Selling Price for 'ciaz' (2014): 7.97760457413362

Predicted Selling Price for 'ciaz' (2017): 7.997756146671067

