Car Price Prediction

**Dependent variable**: Price

**Independent variables**:

|  |  |  |  |
| --- | --- | --- | --- |
| **Variables** | **No of unique values** | **Unique values** | **Use/Value** |
| ID | 18924 |  |  |
| Levy | 559 |  | The tax levied on the car (depends on each car, cannot be generalized) |
| Manufacturer | 65 | 'LEXUS' 'CHEVROLET' 'HONDA' 'FORD' 'HYUNDAI' 'TOYOTA' 'MERCEDES-BENZ'  'OPEL' 'PORSCHE' 'BMW' 'JEEP' 'VOLKSWAGEN' 'AUDI' 'RENAULT' 'NISSAN'  'SUBARU' 'DAEWOO' 'KIA' 'MITSUBISHI' 'SSANGYONG' 'MAZDA' 'GMC' 'FIAT'  'INFINITI' 'ALFA ROMEO' 'SUZUKI' 'ACURA' 'LINCOLN' 'VAZ' 'GAZ' 'CITROEN'  'LAND ROVER' 'MINI' 'DODGE' 'CHRYSLER' 'JAGUAR' 'ISUZU' 'SKODA'  'DAIHATSU' 'BUICK' 'TESLA' 'CADILLAC' 'PEUGEOT' 'BENTLEY' 'VOLVO' 'სხვა'  'HAVAL' 'HUMMER' 'SCION' 'UAZ' 'MERCURY' 'ZAZ' 'ROVER' 'SEAT' 'LANCIA'  'MOSKVICH' 'MASERATI' 'FERRARI' 'SAAB' 'LAMBORGHINI' 'ROLLS-ROYCE'  'PONTIAC' 'SATURN' 'ASTON MARTIN' 'GREATWALL' | Companies that manufactured these models  Not to be considered in order to have a more generalized model |
| Model | 104 |  | Specific model of each car |
| Prod. Year | 54 | 2010, 2011, 2006, 2014, 2016, 2013, 2007, 1999, 1997, 2018, 2008,  2012, 2017, 2001, 1995, 2009, 2000, 2019, 2015, 2004, 1998, 1990,  2005, 2003, 1985, 1996, 2002, 1993, 1992, 1988, 1977, 1989, 1994,  2020, 1984, 1986, 1991, 1983, 1953, 1964, 1974, 1987, 1943, 1978,  1965, 1976, 1957, 1980, 1939, 1968, 1947, 1982, 1981, 1973 | Year car was manufactured |
| Category | 11 | 'Jeep' 'Hatchback' 'Sedan' 'Microbus' 'Goods wagon' 'Universal' 'Coupe'  'Minivan' 'Cabriolet' 'Limousine' 'Pickup' | Type of car |
| Leather interior | 2 | Yes/ No |  |
| Fuel type | 7 | 'Hybrid' 'Petrol' 'Diesel' 'CNG' 'Plug-in Hybrid' 'LPG' 'Hydrogen' |  |
| Engine volume | 107 | '3.5' '3' '1.3' '2.5' '2' '1.8' '2.4' '4' '1.6' '3.3' '2.0 Turbo'  '2.2 Turbo' '4.7' '1.5' '4.4' '3.0 Turbo' '1.4 Turbo' '3.6' '2.3'  '1.5 Turbo' '1.6 Turbo' '2.2' '2.3 Turbo' '1.4' '5.5' '2.8 Turbo' '3.2'  '3.8' '4.6' '1.2' '5' '1.7' '2.9' '0.5' '1.8 Turbo' '2.4 Turbo'  '3.5 Turbo' '1.9' '2.7' '4.8' '5.3' '0.4' '2.8' '3.2 Turbo' '1.1' '2.1'  '0.7' '5.4' '1.3 Turbo' '3.7' '1' '2.5 Turbo' '2.6' '1.9 Turbo'  '4.4 Turbo' '4.7 Turbo' '0.8' '0.2 Turbo' '5.7' '4.8 Turbo' '4.6 Turbo'  '6.7' '6.2' '1.2 Turbo' '3.4' '1.7 Turbo' '6.3 Turbo' '2.7 Turbo' '4.3'  '4.2' '2.9 Turbo' '0' '4.0 Turbo' '20' '3.6 Turbo' '0.3' '3.7 Turbo'  '5.9' '5.5 Turbo' '0.2' '2.1 Turbo' '5.6' '6' '0.7 Turbo' '0.6 Turbo'  '6.8' '4.5' '0.6' '7.3' '0.1' '1.0 Turbo' '6.3' '4.5 Turbo' '0.8 Turbo'  '4.2 Turbo' '3.1' '5.0 Turbo' '6.4' '3.9' '5.7 Turbo' '0.9' '0.4 Turbo'  '5.4 Turbo' '0.3 Turbo' '5.2' '5.8' '1.1 Turbo' | Cars can either be Turbo powered or not  With a corresponding engine volume capacity |
| Mileage | 7687 (convert to int and remove ‘km’) |  |  |
| Cylinders | 13(float) | 6., 4., 8., 1., 12., 3., 2., 16., 5., 7., 9., 10., 14. |  |
| Gear box type | 4 | Automatic', 'Tiptronic', 'Variator', 'Manual' |  |
| Drive wheels | 3 | 4x4', 'Front', 'Rear' | Related to category |
| Doors | 3 | '04-May', '02-Mar', '>5' | ? |
| Wheel | 2 | 'Left wheel', 'Right-hand drive' | Depends on country manufactured in |
| Color | 16 | 'Silver' 'Black' 'White' 'Grey' 'Blue' 'Green' 'Red' 'Sky blue' 'Orange'  'Yellow' 'Brown' 'Golden' 'Beige' 'Carnelian red' 'Purple' 'Pink' |  |
| Airbags | 17 (int) | 12 8 2 0 4 6 10 3 1 16 5 7 9 11 14 15 13 | No of airbags present in car |

**Possible features to engineer:**

|  |  |  |
| --- | --- | --- |
| Feature | Meaning | Possible derivation |
| 0-60 |  |  |
| Horsepower |  |  |
| Torque |  |  |
| kW hour | x amount of Kw for 1 hour | from range and charge time |
| Displacement | Potential area that can be filled with fuel to then create combustible power  Recently, smaller engines have been given a turbo/hybrid to provide more displacement in a small engine, so better performance  (can’t be used as metric anymore) | Engine volume = available space in each of its no of cylinders (in terms of liters) |
| Wheelbase | Distance between the front and rear axles |  |
| Track | Distance between left and right wheel |  |
| Coefficient of Drag (CD) | How well the car can glide through the air, despite friction and turbulence  Effects : decrease means higher top speed, better fuel efficiency, lower wind noise |  |
| Miles per Gallon(MPG)  MPG -E(Electricity) | (not a good metric, weird formula, check skeptic blog)  Used for cars that are electric. | 1 gallon of gas = 1000 BTUs of energy in it = 33.7 kW |
| Cargo and Volume capacity |  |  |
| Wheel size  Ratio of diameter of wheel and width of wheel | Diameter of wheel  effects: bigger wheel means better ride quality, handling and appearance |  |
| Voltage – 12V, 5V | 12V – converts 12V into say 120V for usage  5V – generally used as a USB power outlet |  |
| Weight |  |  |