|  |  |  |
| --- | --- | --- |
| Sr.No | Entities | Attributes |
| 1. | Customer | Customer id |
|  |  | First name |
|  |  | Last name |
|  |  | Address |
|  |  | Gender |
|  |  | Phone number |
|  |  | Annual Income |
|  |  | City |
|  |  | State |
|  |  | Zip code |
| 2. | Potential customer | Potential customer ID |
|  |  | Potential customer Phone |
|  |  | Potential customer Address |
|  |  | Potential customer E-mail |
| 3. | Salesperson | Salesperson Id |
|  |  | First name |
|  |  | Last name |
|  |  | Phone number |
| 4. | Bill of Sales | Invoice Number |
|  |  | Customer id |
|  |  | Salesperson Name |
|  |  | Car Id |
|  |  | Current mileage |
|  |  | Special trim |
|  |  | Alarm system |
|  |  | Audio system |
|  |  | Extended warranty |
|  |  | Salesperson Id |
|  |  |  |
|  |  |  |
| 5. | customization | Customization Id |
|  |  | Special trim |
|  |  | Alarm system |
|  |  | Audio system |
|  |  | Extended warranty |
| 6. | New Cars | Car ID |
|  |  | Model name |
|  |  | Model no |
|  |  | Weight |
|  |  | No of doors |
|  |  | Date of Manufacture |
|  |  | No of cylinder |
|  |  | Price |
|  |  | Color |
|  |  | Option |
|  |  | Place of manufacture |
| 7. | Dealership | Dealer Id |
|  |  | Dealership name |
|  |  | Dealership Address |
|  |  | City |
|  |  | Zip code |
|  |  | Country |
|  |  | Phone |
| 8. | Manufacturer | Manufacturer id |
|  |  | Store number |
|  |  | Name |
|  |  | Address |
|  |  | City |
|  |  | Zip code |
|  |  | Country |
|  |  | Phone |
| 9. | Trade in cars | Trad-in Car id |
|  |  | Model name |
|  |  | Model no |
|  |  | Weight |
|  |  | No of doors |
|  |  | Date of Manufacture |
|  |  | No of cylinder |
|  |  | Price |
|  |  | Color |
|  |  | Option |
|  |  | Place of manufacture |
|  |  | Current Milage |
| 10. | Salesperson Performance | Sales Id |
|  |  | Salesperson id |
|  |  | Commission of sale |
| 11. | Reference | Reply card from Newspaper |
|  |  | radio |
|  |  | Television advertisement |
|  |  | Internet |
|  |  | Referral from buying services |
|  |  | Word of mouth |
|  |  | Magazines |
| 12. | Tax, License and Insurance | Invoice Number |
|  |  | State Sales Tax |
|  |  | License Fee |
|  |  | Insurance Coverage |
| 13. | Previous Sales | Sales Id |
|  |  | Car Id |
|  |  | Dealership Name |
|  |  | Salesperson Name |
| 14. | Financing | Bank Id |
|  |  | Trade-In Discount |

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Q.3.2) Relationship between the entities and their cardinalities

|  |  |  |
| --- | --- | --- |
| Relationship | Cardinality | Description |
| Customer – Salesperson | (1,1) | Salesperson helps customer to buy and browse through the car options |
| Customer – Trade in car | (1, M) | Customers can buy Trade-in cars |
| Customer - New car | (1, M) | Customer can buy new cars |
| Customer – Dealership | (1,1) | Customer makes the payment to the dealership |
| Salesperson- Salesperson Performance | (M,1) | Salesperson gets the pay commission on the bases of the total sales |
| Salesperson- Dealership | (1,1) | Salesperson works for the dealership |
| Customization- Dealership | (1,1) | Dealership implements the customization |
| Tax – Dealership | (1, M) | Dealership gets the tax work done and adds it to the bill |
| Customization-Customer | (1,1) | Customer selects from the available customizations |
| Previous customer – Dealership | (0, M) | Dealership sends survey request to the new customers |
| Reference – Dealership | (1,1) | Dealership gets the reference for potential customers from reference |
| Dealership-Potential customers | (1,1) | Dealership approaches potential customers from the reference it received |
| Financing – Customer | (1, M) | Customer choses a mode of payment |
| Dealership- Manufacturer | (1,1) | Dealership takes the payment from the customer and pays it to the manufacturer |
| Billing of sale -Dealership | (1,1) | Dealership keeps a copy of the bill |
| Customer – Billing of sales | (1,1) | A bill if provided to the customer |
| Reference- customer | (1,1) | Customers learns about the dealership from the referenece |

Q 3.4) The Friendly Cars Dealership Initial List of Assumptions:

1.    A customer can be an individual, a business, an organization, a group, or other such entity.  
2.    Names of customers are not unique, but names of salespeople are unique.  
3.    The same customer may purchase several cars, possibly from different salespeople.  
4.    Some customers, such as religious organizations, are tax exempt, so no tax is charged on their car purchases.  
5.    All addresses consist of street, city, state, and zipcode.  
6.    All telephone numbers consist of area code and number.   
7.    The used cars for sale in the dealership are those that are traded in by customers buying new cars.  
8.    When a car is sold, it may or may not be financed.   
9.    Options are features that a new car has when it is delivered from the manufacturer, such as sun roof, air conditioning, and so on. A car may have several optional features.  
10.    The cost of options is included in the manufacturer’s list price.  
11.    Customization refers to items that are added at the dealership at the time of sale, such as an alarm system, undercoating, and so on. A car may be given several custom items.  
12.    Each custom item has an associated price.  
13.    The book value of a used car is determined by a standard publication such as the Kelley Blue Book, available to the dealership. The actual cost may differ from the book value.  
14.    When a trade-in vehicle is accepted, its VIN is immediately entered into the inventory of used cars. Other information about the car is entered later.  
15.    We are assuming that the dealer can obtain and issue registration numbers and license plates as needed. (We note that this process may be more complex in real life.)  
16.    The exact mileage at the time of sale must be recorded on the bill of sale, for both new

and used cars.