

## Data Model Solution

Artist ID	Artist Name	Painting Id	Painting Title	Purchase date	Purchase price	Purchaser name	Purchaser address	Purchaser city
3	Frederick Simons	1	Still life	01/03/2019	500.00	Steve Owens	1345 W Wells Street	Milwaukee
5	Adalbert Durer	2	Hare	01/03/2019	1200.00	Jarislav Richter	1832 17th Street	Milwaukee
7	Winnie Gough	3	Sunflowers	01/04/2019	150.00	Steve Owens	1345 W Wells Street	Milwaukee
3	Frederick Simons	4	Carp in pond	01/05/2019	545.00	Franz List	1732 W Wisconsin Avenue	Milwaukee

1. Create the scheme for this database table  
(Artist ID, Artist name, Painting ID, Painting Title, Purchase Date, Purchase Price, Purchaser name, Purchaser Address, Purchaser City)
2. Explain why this scheme suffers from the redundancy, the update, and the deletion anomaly

Redundancy anomaly:

Information about the address is repeated as is information about the title of the painting and its painter is repeated, ...

Update anomaly:

A change forces all instances of redundancy to be updated

Deletion anomaly:

We loose customer address data if a single purchase is deleted, which might not be so bad since it would be a privacy feature.

3. Here are some functional dependencies:
  1. Artist ID → Artist Name;
  2. Painting Id → Painting Title;
  3. Painting ID, Purchase date → Purchase price (Paintings can be resold, but not on the same day?)
 Others are more dubious. Would Purchaser name and Purchaser city determine the Purchaser address?

4. To break it up, we want to create single IDs for each record as artificial keys. This is not strictly necessary, but might be useful.

artist: (Artist ID, Artist name)

painting: (Painting ID, Painting title)

Painted\_by: (Painting ID, Artist ID) (to determine who painted a painting)

Client: (Client ID, Client name, Client address, Client city)

Purchase: (Purchase ID, Painting ID, Client ID, Purchase Date, Purchase Price)

Because of the IDs, we can store all of the data in columnar form, though we might want to actually store some columns together.

5. JSON format:

```
"purchases": [  
  { "Artist ID": "7",  
    "Artist Name": "Frederick Simons",  
    "Painting ID": "1",  
    "Painting Title": "Still Life",  
    "Purchase Date": "01/03/2019",  
    ...  
  },  
  {  
    ...  
  },  
]
```

5. Vertices are entities (with properties) and edges represent relations.



