a) Name of the application, team members

Application name: Bike Finder
Group members: Jeff Eben, Tristan Maidment, Aditya Malik

b) Application background and what it will be used for

Application background: The purpose of our project is to organize bikes, whose details are contained on website sprawled all across the internet, and store their details in one central database. The reason we are doing this is because it is very hard to find consistent information about bikes with different prices and components since each manufacturer stores their own bikes information on their websites, and each manufacturer's website has a different layout and stores information differently. This application will allow users to search different bikes by part, price, manufacturer, and more without needing to spend hours clicking hundreds of links online. Since bikes have common components among different models from the same and different manufacturers, our idea was to create a bike entity whose attributes would consist of the manufacturer, price, and different components on the bike. This would allow the user to look up bikes based on their price, manufacturer, parts, model, and release year. Since the components are not unique to each bike, we had them as foreign keys that reference component entities to avoid redundancy. Because each bike has 9 main components and a manufacturer (plus non-referencing attributes) we had to use more than the recommended 5-10 tables.

c) Data description, including all constraints that need to be enforced

Entities:

Bike:

Attribute name:	**Data type:**	**Constraints:**
ModelName	varchar	primary key
ManufacturerName	varchar	primary key, foreign key references Manufacturer
DerailleurID	varchar	foreign key references Derailleur
RearShockID	varchar	foreign key references RearShock
FrontShockID	varchar	foreign key references FrontShock
BrakeID	varchar	foreign key references Brake
ShifterID	varchar	foreign key references Shifter
FrameID	varchar	foreign key references Frame, not null
WheelID	varchar	foreign key references Wheel, not null
CranksetID	varchar	foreign key references Crankset, not null
HandlebarID	varchar	foreign key references Handlebar, not null
price	integer	not null
year	integer	not null

picture	raw	not null

Manufacturer:

Attribute name:	**Data type:**	**Constraints:**
ManufacturerName	varchar	primary key
address	varchar	not null
website	varchar	

Derailleur:

Attribute name:	**Data type:**	**Constraints:**
DerailleurID	varchar	Primary key

RearShock:

Attribute name:	**Data type:**	**Constraints:**
RearShockID	varchar	Primary key
travel_mm	integer	not null

FrontShock:

Attribute name:	**Data type:**	**Constraints:**
FrontShockID	varchar	Primary key
travel_mm	integer	not null

Brake:

Attribute name:	**Data type:**	**Constraints:**
BrakeID	varchar	Primary key
BrakeType	enum	not null

Shifter:

Attribute name:	**Data type:**	**Constraints:**
ShifterID	varchar	Primary key
Family	enum	not null

Frame:

Attribute name:	**Data type:**	**Constraints:**
FrameID	varchar	Primary key
FrameType	enum	not null
MaterialType	enum	not null

Wheel:

Attribute name:	**Data type:**	**Constraints:**
WheelID	varchar	Primary key

WheelSize	integer	not null

Crankset:

Attribute name:	**Data type:**	**Constraints:**
CranksetID	varchar	Primary key

Handlebar:

Attribute name:	**Data type:**	**Constraints:**
HandlebarID	varchar	Primary key
Width	varchar	not null
MaterialType	enum	not null

Relations:

bike_manufacturer:

Attribute name:	**Data type:**	**Constraints:**
ModelName	varchar	Primary Key, Foreign Key references Bike
ManufacturerName	varchar	Primary Key, Foreign Key references Bike, Manufacturer

bike_derailleur:

Attribute name:	**Data type:**	**Constraints:**
ModelName	varchar	Primary Key, Foreign Key references Bike
ManufacturerName	varchar	Primary Key, Foreign Key references Bike
DerailleurID	varchar	Foreign Key references Derailleur

bike_rearShock:

Attribute name:	**Data type:**	**Constraints:**
ModelName	varchar	Primary Key, Foreign Key references Bike
ManufacturerName	varchar	Primary Key, Foreign Key references Bike
RearShockID	varchar	Foreign Key references RearShock

bike_frontShock:

Attribute name:	**Data type:**	**Constraints:**
ModelName	varchar	Primary Key, Foreign Key references Bike
ManufacturerName	varchar	Primary Key, Foreign Key references Bike

FrontShockID	varchar	Foreign Key references FrontShock

bike_brake:

Attribute name:	**Data type:**	**Constraints:**
ModelName	varchar	Primary Key, Foreign Key references Bike
ManufacturerName	varchar	Primary Key, Foreign Key references Bike
BrakeID	varchar	Foreign Key references Brake

bike_shifter:

Attribute name:	**Data type:**	**Constraints:**
ModelName	varchar	Primary Key, Foreign Key references Bike
ManufacturerName	varchar	Primary Key, Foreign Key references Bike
ShifterID	varchar	Foreign Key references Shifter

bike_frame:

Attribute name:	**Data type:**	**Constraints:**
ModelName	varchar	Primary Key, Foreign Key references Bike
ManufacturerName	varchar	Primary Key, Foreign Key references Bike
FrameID	varchar	Foreign Key references Frame

bike_wheel:

Attribute name:	**Data type:**	**Constraints:**
ModelName	varchar	Primary Key, Foreign Key references Bike
ManufacturerName	varchar	Primary Key, Foreign Key references Bike
WheelID	varchar	Foreign Key references Wheel

bike_crankset:

Attribute name:	**Data type:**	**Constraints:**
ModelName	varchar	Primary Key, Foreign Key references Bike
ManufacturerName	varchar	Primary Key, Foreign Key references Bike
CranksetID	varchar	Foreign Key references Crankset

bike_handlebar:

Attribute name:	**Data type:**	**Constraints:**
ModelName	varchar	Primary Key, Foreign Key references Bike
ManufacturerName	varchar	Primary Key, Foreign Key references Bike
HandlebarID	varchar	Foreign Key references Handlebar

The relationships between the bike and manufacturer/components are as follows:

- Bike has partial participation in
    - bike_derailleur (one derailleur to many bikes)
    - bike_rearSshock (one shock to many bikes)
    - bike_frontShock (one shock to many bikes)
    - bike_brake (one brake to many bikes)
    - bike_shifter (one shifter to many bikes)

- Bike has full participation in:
    - bike_frame (one frame to many bikes)
    - bike_wheels (one wheel to many bikes)
    - bike_crankset (one crankset to many bikes)
    - bike_handlebars (one handlebar to many bikes)
    - bike_manufacturer (one manufacturer to many bikes)

d) E-R diagram