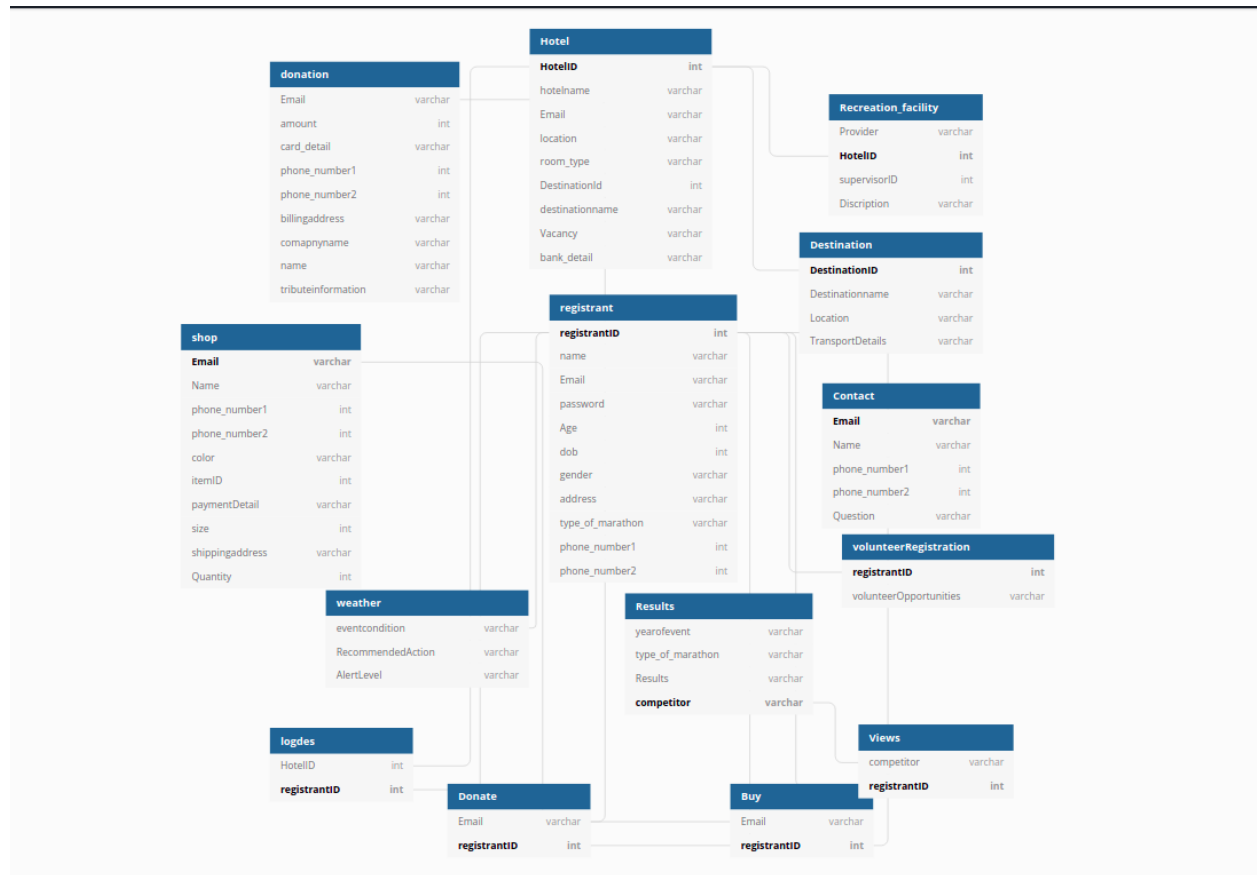
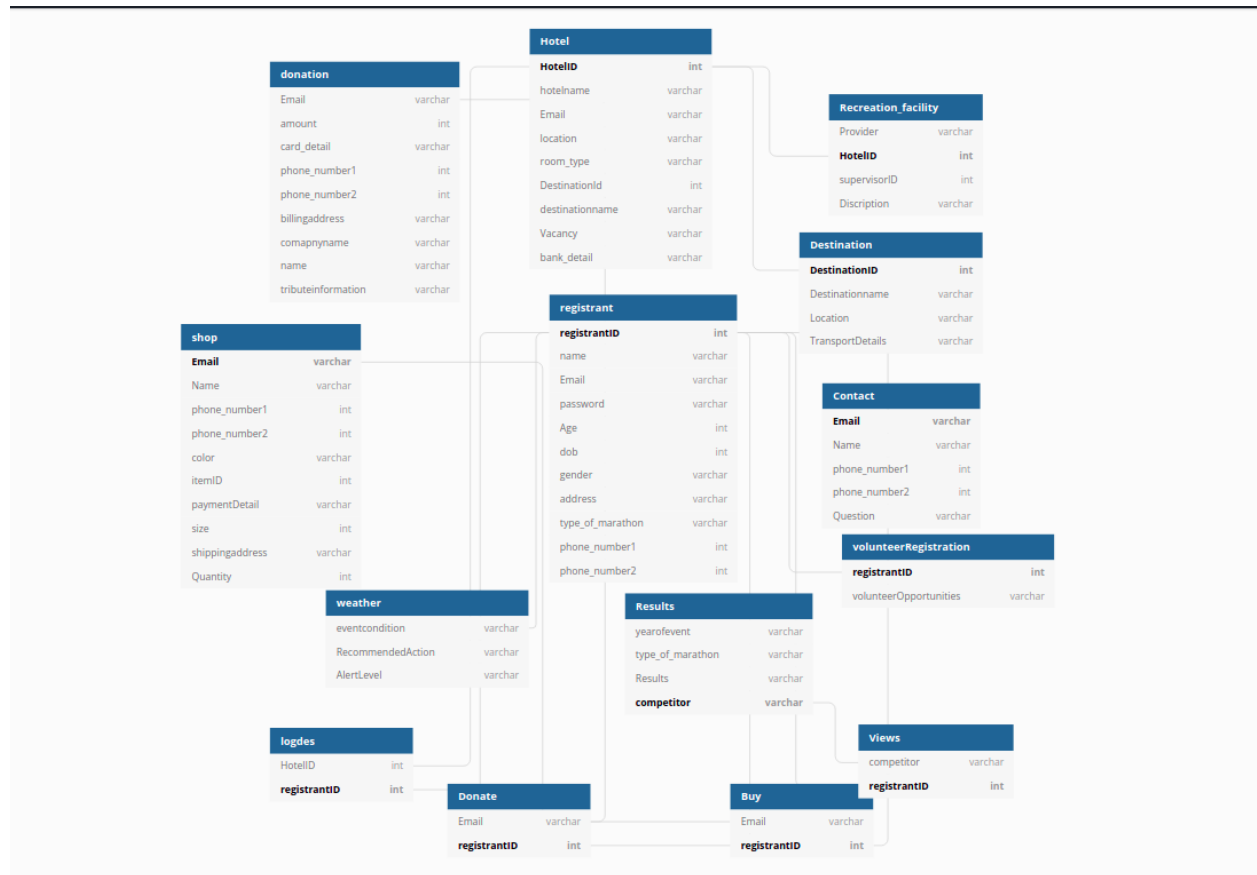


After 1NF conversion :-



After 2NF conversion :-



After 3NF conversion :-



Entities:

Registrant (RegistrationID, Name, Email, Password, Age, DOB, Gender, Address, TypeOfMarathon, PhoneNumbers)

Hotel (HotelID, HotelName, Location, RoomType, DestinationID, DestinationName, Vacancy, BankDetails)

Donation (Email, Amount, CardDetails, PhoneNumber, BillingAddress, CompanyName, Name, TributeInformation)

RecreationalFacility (Provider, HotelID, SupervisorID, Description)

Destination (DestinationID, DestinationName, Location, TransportDetails)

Shop (Email, Name, PhoneNumbers, Color, ItemID, PaymentDetails, Size, ShippingAddress, Quantity)

Contact (Name, Email, PhoneNumber, Question)

Weather (EventConditions, RecommendedActions, AlertLevel)

Results (YearOfEvent, TypeOfMarathon, Results, Competitor)

VolunteerRegistration (RegistrationID, VolunteerOpportunities)

Relationships:

Lodges (hotel id, registration id)

Donate (email id, registration id) [composite key present]

Buy (email id, registration id) [composite key present]

Views (competitor, registrant id)

First Normal Form (1NF):

As there are Multivalued Attributes in the Relationship (PhoneNumbers in Shop, Registrant), The model is not in 1NF. To convert it into 1NF we will add another column named PhoneNumber2 (there can be a maximum of 2 phone numbers), and now it is in 1NF:

Registrant (RegistrationID, Name, Email, Password, Age, DOB, Gender, Address, TypeOfMarathon, PhoneNumber1, PhoneNumber2)

Hotel (HotelID, HotelName, Location, RoomType, DestinationID, DestinationName, Vacancy, BankDetails)

Donation (Email, Amount, CardDetails, PhoneNumber1, phonenumber2, BillingAddress, CompanyName, Name, TributeInformation)

RecreationalFacility (Provider, HotelID, SupervisorID, Description)

Destination (DestinationID, DestinationName, Location, TransportDetails)

Shop (Email, Name, PhoneNumber1, PhoneNumber2, Color, ItemID, PaymentDetails, Size, ShippingAddress, Quantity)

Contact (Name, Email, PhoneNumber1 ,phonenumber2, Question)

Weather (EventConditions, RecommendedActions, AlertLevel)

Results (YearOfEvent, TypeOfMarathon, Results, Competitor)

VolunteerRegistration (RegistrationID, VolunteerOpportunities)

Lodges (hotel id, registration id)

Donate (email id, registration id) [composite key present]

Buy (email id, registration id) [composite key present]

Views (competitor, registrant id)

Conversion to other normal forms:

Registrant (RegistrationID, Name, Email, Password, Age, DOB, Gender, Address, TypeOfMarathon, PhoneNumber1, PhoneNumber2)

Candidate keys - Email, RegistrationID

Primary attributes - Email, RegistrationID

Non-primary - Remaining

Relationships - DOB -> Age

All the non prime attributes are fully functional dependent on candidate keys. Therefore, the table is in 2NF also. After 2NF:

1. Registrant (RegistrationID, Name, Email, Password, DOB, Gender, Address, TypeOfMarathon, PhoneNumber1, PhoneNumber2)

As there is a transitional dependency RegistrationID -> DOB -> Age, the table is not in 3NF. We will have to decompose the table, creating 2 tables:

1. Registrant (RegistrationID, Name, Email, Password, DOB, Gender, Address, TypeOfMarathon, PhoneNumber1, PhoneNumber2)
2. AgeTable (DOB, Age)

Hotel (HotelID, HotelName, Location, RoomType, DestinationID, DestinationName, Vacancy, BankDetails)

Candidate key - HotelID

Primary attribute - HotelID

Non primary - remaining

Relationship - Location -> DestinationName, Location -> DestinationID

All the non prime attributes are fully functional dependent on candidate keys. Therefore, the table is in 2NF also. After 2NF:

1. Hotel (HotelID, HotelName, Location, RoomType, DestinationID, DestinationName, Vacancy, BankDetails)

As there are transitional dependencies HotelID -> Location -> DestinationName, HotelID -> Location -> DestinationID, the table is not in 3NF. We will have to decompose the table, creating 2 tables:

1. Hotel (HotelID, HotelName, Location, RoomType, Vacancy, BankDetails)
2. LocationTable (Location, DestinationID, DestinationName)

Donation (Email, Amount, CardDetails, PhoneNumber, BillingAddress, CompanyName, Name, Tribute Information)

Candidate key - Email

Primary attributes - Email

Non-primary attributes - remaining.

Relationship - CardDetails -> PhoneNumber

All the non prime attributes are fully functional dependent on candidate keys. Therefore, the table is in 2NF also. After 2NF:

1. Donation (Email, Amount, CardDetails, PhoneNumber, BillingAddress, CompanyName, Name, Tribute Information)

As there is a transitional dependency Email -> CardDetails -> PhoneNumber, the table is not in 3NF. We will have to decompose the table, creating 2 tables:

1. Donation (Email, Amount, CardDetails, BillingAddress, CompanyName, Name, Tribute Information)
2. Card (CardDetails, PhoneNumber)

RecreationalFacility (Provider, HotelID, SupervisorID, Description)

Candidate key - SupervisorID

Primary attribute - SupervisorID

Non primary attribute - remaining

Relationship - None

All the non prime attributes are fully functional dependent on candidate keys. Therefore, the table is in 2NF also. After 2NF:

1. RecreationalFacility (Provider, HotelID, SupervisorID, Description)

As there is no transitional dependency, the table is in 3NF also. After 3NF:

1. RecreationalFacility (Provider, HotelID, SupervisorID, Description)

Destination (DestinationID, DestinationName, Location, TransportDetails)

Candidate Key - DestinationID, Location

Primary attribute - DestinationID, Location

Non primary attribute - remaining

Relationship - None

All the non prime attributes are fully functional dependent on candidate keys. Therefore, the table is in 2NF also. After 2NF:

1. Destination (DestinationID, DestinationName, Location, TransportDetails)

As there is no transitional dependency, the table is in 3NF also. After 3NF:

1. Destination (DestinationID, DestinationName, Location, TransportDetails)

Shop (Email, Name, PhoneNumber1, PhoneNumber2, Color, ItemID, PaymentDetails, Size, ShippingAddress, Quantity)

Candidate Key - Email

Primary attribute - Email

Non primary attribute - remaining

Relationship - None

All the non prime attributes are fully functional dependent on candidate keys. Therefore, the table is in 2NF also. After 2NF:

1. Shop (Email, Name, PhoneNumber1, PhoneNumber2, Color, ItemID, PaymentDetails, Size, ShippingAddress, Quantity)

As there is no transitional dependency, the table is in 3NF also. After 3NF:

1. Shop (Email, Name, PhoneNumber1, PhoneNumber2, Color, ItemID, PaymentDetails, Size, ShippingAddress, Quantity)

Contact (Name, Email, PhoneNumber1 ,Phonenumber2, Question)

Candidate key - Email

Primary attribute - Email

Non primary attribute - remaining

Relationship - None

All the non prime attributes are fully functional dependent on candidate keys. Therefore, the table is in 2NF also. After 2NF:

1. Contact (Name, Email, PhoneNumber1 ,Phonenumber2, Question)

As there is no transitional dependency, the table is in 3NF also. After 3NF:

1. Contact (Name, Email, PhoneNumber1 ,Phonenumber2, Question)

Weather (EventConditions, RecommendedActions, AlertLevel)

Candidate Key - EventConditions

Primary attribute - EventConditions

Composite attribute - remaining

Relationship - AlertLevel -> RecommendedActions

All the non prime attributes are fully functional dependent on candidate keys. Therefore, the table is in 2NF also. After 2NF:

1. Weather (EventConditions, RecommendedActions, AlertLevel)

As there is a transitional dependency EventConditions -> AlertLevel -> RecommendedActions, the table is not in 3NF. We will have to decompose the table, creating 2 tables:

1. Weather (EventConditions, AlertLevel)
2. Actions (Alertlevel, RecommendedActions)

VolunteerRegistration (RegistrationID, VolunteerOpportunities)

Candidate key - registration id

Primary attribute - registration id

Composite attribute - remaining

Relationship - None

All the non prime attributes are fully functional dependent on candidate keys. Therefore, the table is in 2NF also. After 2NF:

1. VolunteerRegistration (RegistrationID, VolunteerOpportunities)

As there is no transitional dependency, the table is in 3NF also. After 3NF:

1. VolunteerRegistration (RegistrationID, VolunteerOpportunities)

AS THERE ARE ONLY TWO ATTRIBUTES IN ALL RELATIONSHIP TABLES, THEY WILL BE IN ALL NORMAL FORMS.

Second Normal Form (2NF):

Registrant (RegistrationID, Name, Email, Password, Age, DOB, Gender, Address, TypeOfMarathon, PhoneNumber1, PhoneNumber2)

Hotel (HotelID, HotelName, Location, RoomType, DestinationID, DestinationName, Vacancy, BankDetails)

Donation (Email, Amount, CardDetails, PhoneNumber1, phonenumber2, BillingAddress, CompanyName, Name, TributeInformation)

RecreationalFacility (Provider, HotelID, SupervisorID, Description)

Destination (DestinationID, DestinationName, Location, TransportDetails)

Shop (Email, Name, PhoneNumber1, PhoneNumber2, Color, ItemID, PaymentDetails, Size, ShippingAddress, Quantity)

Contact (Name, Email, PhoneNumber1 , phonenumber2, Question)

Weather (EventConditions, RecommendedActions, AlertLevel)

Results (YearOfEvent, TypeOfMarathon, Results, Competitor)

VolunteerRegistration (RegistrationID, VolunteerOpportunities)

Lodges (hotel id, registration id)

Donate (email id, registration id) [composite key present]

Buy (email id, registration id) [composite key present]

Views (competitor, registrant id)

Third Normal Form (3NF):

Registrant (RegistrationID, Name, Email, Password, DOB, Gender, Address, TypeOfMarathon, PhoneNumber1, PhoneNumber2)

AgeTable (DOB, Age)

Hotel (HotelID, HotelName, Location, RoomType, Vacancy, BankDetails)

LocationTable (Location, DestinationID, DestinationName)

Donation (Email, Amount, CardDetails, BillingAddress, CompanyName, Name, Tribute Information)

Card (CardDetails, PhoneNumber)

RecreationalFacility (Provider, HotelID, SupervisorID, Description)

Destination (DestinationID, DestinationName, Location, TransportDetails)

Shop (Email, Name, PhoneNumber1, PhoneNumber2, Color, ItemID, PaymentDetails, Size, ShippingAddress, Quantity)

Contact (Name, Email, PhoneNumber1 ,phonenummer2, Question)

Weather (EventConditions, AlertLevel)

Actions (Alertlevel, RecommendedActions)

Results (YearOfEvent, TypeOfMarathon, Results, Competitor)

VolunteerRegistration (RegistrationID, VolunteerOpportunities)

Lodges (hotel id, registration id)

Donate (email id, registration id) [composite key present]

Buy (email id, registration id) [composite key present]

Views (competitor, registrant id)