Project 1 Report - Milestone 2

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Entities:
All keys will have integrity constraint(Unique and No Null values)
All foreign keys will have referential integrity constraints(No dangling references)

General Constraints:
1. Sick patients should be associated with at least one disease.
2. Sick patients should have at least one Health Supporter(Primary Supporter). Primary should not be deleted when no secondary Health Supporter is present.
3. All the dates in the application should not be later than current date
4. Non overlapping constraint in well patient and sick patient.
5. Each alert should have at least one person who can view it.
6. Limit values should same as that mentioned in the metric type.
7. Only a patient or a health supporter for the patient can add/edit health supporter information.
8. If a patient is assigned a disease, he needs to add a health supporter in next logins before any other task can be done.
9. A Health Supporter cannot clear alerts before seeing them.

Note: Domain Name constraints, key constraint, foreign key constraints and functional dependencies have been mentioned in the tables below for each entity and relationship for which we can form a table.

Entity	Attribute	Key Constraints	FDs
People	UID, First Name, Last Name, AddressId	Domain Name Constraints: UID(Number(8)), FirstName(Character(15)), LastName(Character(15)), AddressId(Number(8)) Key Constraints: UID Integrity Rule: No NULL value in Primary Key Referential Integrity: AddressId General Constraints:	UID ->FirstName, LastName, AddressId

Address	<u>AddressId,</u> StreetId, Apartment No.	Domain Name Constraints: AddressId(Number(8)), StreetId(Number(8)), Apartment No(Character(10)) Key Constraints: AddressId Integrity Rule: No NULL value in Primary Key Referential Integrity: StreetId General Constraints:	AddressId -> StreetId, Apartment No.
Street	<u>StreetId,</u> Street, Zip	Domain Name Constraints: StreetId(Number(8)), Street(Character(20)), Zip(Number(8)) Key Constraints: StreetId Integrity Rule: No NULL value in Primary Key Referential Integrity: Zip General Constraints:	StreetId -> Street, Zip
Zip	<u>Zip</u>, State, City	Domain Name Constraints:Zip(Number(8)), State(Character(20)), City(Character(20)) Key Constraints: Zip Integrity Rule: No NULL value in Primary Key Referential Integrity: N/A General Constraints:	Zip -> State, City
Health Supporter ----	Contact Number	Domain Name Constraints: UID(Number(8)), Contact Number (Number (10)) Key Constraints: UID Referential Integrity: UID should be present in People. General Constraints:	UID -> ContactNumber
Patient	DOB, Gender	Domain Name Constraints: UID(Number(8)), DOB(Date), Gender(Character(1)) Key Constraints: UID Referential Integrity: UID should be present in People. General Constraints: Date should not be later than current date, Gender can only be M or F.	UID -> DOB, Gender
Well Patient		Domain Name Constraints: UID(Number(8)), Key Constraints: UID Referential Integrity:UID must be present in People General Constraints: UID should not be present in both well patient and sick patient.	UID
Sick Patient		Domain Name Constraints: UID(Number(8)), Key Constraints: UID	UID

		Referential Integrity:UID must be present in People General Constraints: UID should not be present in both well patient and sick patient.	
Diseases ----	Name, Description	Domain Name Constraints:Name(Character(30)), Description(Character(100)) Key Constraints: Name Referential Integrity: General Constraints:	Name->Desc
Recommendation	ID, Frequency ID, Threshold	Domain Name Constraints:Recommendation ID(Number(8)), FrequencyID(Number(8)), Threshold(Number(4)) Key Constraints: Recommendation Id Referential Integrity: FrequencyID must be present in Frequency table. General Constraints:	ID->FrequencyID, Threshold
Limits	Limit ID, Lower Limit, Upper Limit	Domain Name Constraints: LimitID(Number(8)), LowerLimit (Number(4)), Upper Limit(Number(4)) Key Constraints: UID Integrity Rule: No NULL value in Primary Key Referential Integrity: General Constraints: Limit values are based on the type of the metric.	Limit ID -> Lower Limit, Upper Limit
Metrics **(Weak Entity)**	Name, Type	No relation created as it is a weak entity.	
Observation Specifications	Unique name, Description	Domain Name Constraints: Unique Name(Character(30)), Description(Character(60)) Key Constraints: Unique Name General Constraints:	Unique name-> Description
Observations---	Observation ID, Observation Value, Observed Time, Recorded Time	Domain Name Constraints: Observation ID(Number(8)), Observation Value(Character(15)), Observed Time(Date), Recorded Time(Date)) Key Constraints: Observation ID General Constraints: Observation Value should be based on the type of the metric.	ObservationID-> ObservationValue, Observed Time, Recorded Time
Metric Type Values	MTVID,MTValue	Domain Name Constraints: MTVID(Number(8)),MTValue(Character(15)) Key Constraints: MTVID Integrity Rule: No NULL value in Primary Key Referential Integrity:	MTVID->MTValue

		General Constraints:	
Alerts	Alert ID, Alert Type, Action Taken	Domain Name Constraints: Alert ID(Number(8)), Alert Type(Character(15)), Action Taken(Boolean) Key Constraints: Alert ID Integrity Rule: No NULL value in Primary Key Referential Integrity: General Constraints: Alert Type can be of just two types: Outside-the-limit and Low-activity	AlertID -> Alert Type , Action Taken
Frequency	Frequency ID, Duration, Number Of Times	Domain Name Constraints: Frequency ID(Number(8)),Duration(Character(8)), Number Of Times (Number(8)) Key Constraints: Frequency ID Integrity Rule: No NULL value in Primary Key Referential Integrity: General Constraints: Duration can be Daily, Weekly, Monthly and Yearly.	Frequency ID -> Duration, Number of Times

Relationships:

1. ISA relationships:

Relationship	Relationship Type	Parent Entity	Entity 1	Entity 2
ISA	Hierarchical	Patient	Well Patient	Sick Patient
ISA	Hierarchical	People	Health Supporter	Patient

2. Binary relationships:
The participation constraints in the relations are partial(zero or more) unless otherwise stated.

Relationship	Relationship Attribute	Relationship Type (Key Constraints)	Entity 1 (With participation constraints)	Entity 2 (With participation constraints)	Constraints	FDs
Assigned	Authorization date, primary/secondary	N - N	Health Supporter	Patient	Domain Name Constraints: HSUID(Number(8)), PatientUID(Number(8)), Authorization date(Date), ,	(HSUID,Patient UID) -> Authorization date,

					Primary/Secondary (Character(1)) Key Constraints: (HSUID,PatientUID) Integrity Rule: No NULL value in composite Primary key (Uid(health supporter), Uid(patient)), Referential Integrity: Uid(Health Supporter), Uid(Patient) refers to uid of a person in health supporter and Patient table respectively. General Constraints: Each sick patient should have a Primary Health Supporter. Upon deletion of a Primary Health Supporter, a secondary HS will become primary.	Primary/Secondary
for	N/A	N - 1	Observation	Patient	Domain Name Constraints: UIDPatient(Number(8)), ObservationID Key Constraints: (ObservationID) Referential Integrity: , Uid(Patient) refers to uid of a person in the Patient table. General Constraints:	ObservationID -> UIDPatient
includes	N/A	N - 1	Recommendation (at most once)	Observation specification	Domain Name Constraints: RecommendationID(Number(8)), ObservationName(character(30)) Key Constraints: composite key(RecommendationID(Number(8)), ObservationName(character(30))) Integrity Rule: No NULL value for the primary key Referential Integrity: RecommendationID refers to entry in recommendation table ObservationName refers to entry in ObservationSpec table. General Constraints:	RecommendationID, ObservationName

for	N/A	N - 1	Limits	Metrics (exactly once)	Domain Name Constraints: LimitID(Number(8)), MetricName(Character(30), ObservationName(character(30)) Key Constraints: composite key(MetricName(character(30)), ObservationName(character(30))) Integrity Rule: No NULL value for the primary key Referential Integrity: LimitID refers to entry in Limit table ObservationName refers to entry in ObservationSpec table, MetricName refers to entry in Metric table. General Constraints:	MetricName, ObservationName, LimitId
has_minor	N/A	N - N	Well Patient	Disease	Domain Name Constraints: UID(Number(8)), Disease Name(character(30), Key Constraints: composite key(DiseaseName(character(30)), UID(number(8))) Integrity Rule: No NULL value for the primary key Referential Integrity: DiseaseName refers to entry in disease table. UID refers to entry in well patient table. General Constraints:	UID,DiseaseName
has_major	N/A	N - N	Sick(once or more)	Disease	Domain Name Constraints: UID(Number(8)), Name(character(30), Key Constraints: composite key(DiseaseName(character(30)), UID(number(8))) Integrity Rule: No NULL value for the primary key Referential Integrity: DiseaseName refers to entry in disease table. UID refers to entry in well patient table. General Constraints:	UID, DiseaseName

Has --- SAMRUDHI	N/A	N - N	Metrics	Metric Type Values	Domain Name Constraints: MTVID(character(8)), Metric Name(character(30), ObservationName (character(30)) Key Constraints: composite key(MTVID(character(8)), Name(character(30), ObservationName (character(30))) Integrity Rule: No NULL value for the primary key Referential Integrity:MTVID refers to entry in MetricTypeValue table. Name,ObservationName refers to entry in weak entity identifying relationship table.. General Constraints:	MTVID, Metric Name, ObservationName
in	N/A	Weak Entity Identifying Relationship, N - N	Metrics	Observations Specification	Domain Name Constraints: MetricName(Character(15)), ObservationSpecificationName(Character(15), MetricType(Character(10)) Key Constraints: MetricName, ObservationSpecificationName Referential Integrity: ObservationSpecificationName must be present in the Observation Specification table. General Constraints: MectricType can be of values Ordinal or Numerical.	MetricName(Character, ObservationSpecificationName -> MetricType
for	N/A	N - 1	Recommendation (Exactly Once)	Patient	Domain Name Constraints: RecommendationID(Number(8)), Patient UID(Number(8)) Key Constraints: (RecommendationID) Referential Integrity: , Uid(Patient) refers to uid of a person in the Patient table. General Constraints:	RecommendationID -> Patient UID
Can view	N/A	N to N	People	Alert (once or more)	Domain Name Constraints: AlertId(Number(8)), UID(Number(8)) Key Constraints: (AlertId, UID)	AlertId, UID

					Referential Integrity: , UID refers to uid of a person in the People table. General Constraints:	
for	N/A	1 - N	Patient (exactly once)	Alert (exactly once)	Domain Name Constraints: AlertId(Number(8)), Patient UID(Number(8)) Key Constraints: (AlertId) Referential Integrity: , UID refers to uid of a person in the Patient table. General Constraints:	AlertID->UID
of	N/A	1 - N	Frequency (Exactly once)	Recommenda tion	Domain Name Constraints: FrequencyId(Number(8)), Recommendation ID(Number(8)) Key Constraints: (RecommendationID) Referential Integrity: , RecommendationID and FrequncyID refers to entries in Recommendation and Frequency table. General Constraints:	Recommendati onID -> FrequencyId
for	N/A	N - 1	Alerts (At most once)	Limits	Domain Name Constraints: Alert ID(Number(8)),LimitID(Numbe r(8)) Key Constraints: (Alert ID) Integrity Rule: No NULL value in composite Referential Integrity: LimitID should be in Limit General Constraints:	Alert ID -> LimitID
has	N/A	1 - N	Observation Specification	Observations (Exactly Once)	Domain Name Constraints: Metric Name(Character(15)), Observation Specification Name(Character(15)), ObservationId(Number(8)) Key Constraints: Metric Name(Character(15)),Observ ation Specification Name(Character(15)), ObservationId(Number(8)) Referential Integrity: ObservationId, MetricName, Observation Specification Name General Constraints:	Metric Name,Observat ion Specification Name, ObservationId

for	N/A	N - 1	Alerts (At most once)	Recommendation	Domain Name Constraints: : Alert ID(Number(8)), RecommendationID(Number(8)) Key Constraints: (Alert ID(Number(8)), RecommendationID(Number(8))) Integrity Rule: No NULL value in composite Primary key (Alert ID(Number(8)), RecommendationID(Number(8))), Referential Integrity:RecommendationID	Alert Id -> Recommendation Id

3. Ternary:

Relationship	Relationship Attribute	Entity 1	Entity 2	Entity 3	Constraints	FDs
for	N/A	Recommendation (At Most Once)	Observation specification	Disease	Domain Name Constraints:Recommendation ID(Number(8)),ObservationSpecificationName(Character(30)),Disease Name(Character(30)), Key Constraints: RecommendationID, ObservationSpecificationName, DiseaseName Integrity Rule: No NULL value in Primary Key Referential Integrity: RecommendationID should be present in Recommendation, ObservationSpecificationName should be present in Observation Specification and Disease Name should present in disease. General Constraints:	Recommendation ID,ObservationSpecificationName,Disease Name
for	N/A	Recommendation (At Most Once)	Patient	Observation specification	Domain Name Constraints: Recommendation ID(Number(8)),ObservationSpecificationName(character(30)),UID. Key Constraints: RecommendationID, Observation Specification Name and UID Integrity Rule: No NULL value in Primary Key	Recommendation ID,ObservationSpecificationName,UID.

					Referential Integrity: RecommendationID, Observation Specification Name and UID should be present in Recommendation, Observation Specification and People. General Constraints:	
has	N/A	Limits(At Most Once)	Metrics	Diseases	Domain Name Constraints:LimitID(number(8)), MetricName(character(15)),DiseaseNa me(Character(8)),Observation Specificaiton Name(character(30)) Key Constraints: LimitID,DiseaseName,Observation Specification Name Integrity Rule: No NULL value in Primary Key Referential Integrity: LimitID, DiseaseName,Observation Specification Name should be present in Limits, Disease and Observation Specifciation respectively. General Constraints:	LimitID, MetricName(characte r,DiseaseName,Obse rvation Specificaiton Name
for	N/A	Limits(At Most Once)	Metrics	Patient	Domain Name Constraints: :LimitID(Number(8)), MetricName(Character(15)) Patient ID(Number(8)),Observation Specificaiton Name(character(30)) Key Constraints: LimitID,,PatientID, Observation Specification Name Integrity Rule: No NULL value in Primary Key Referential Integrity:LimitID, MetricName,PatientID,SpecificationNa me should be present in Limits, Disease, Patients, Observation Specifcaiton General Constraints:	LimitID, MetricName, Patient ID,Observation Specificaiton Name