M2

Players(AccountNumber: integer, Forename: string, Surname string, EmailAddress: string)

IC: Primary Key(AccountNumber), AccountNumber not null, Forename not null, EmailAddress not null.

The normalisation level for this is first normal form since every attribute is atomic, but since someone could have the same forename and surname, so not every attribute is fully dependent on the primary key.

CharactersOwn(AccountNumber: integer, CharacterName: string, Health: integer, AttackinScore: integer, DefenceScore: integer, ManaScore: integer , CharacterExpiryDate: string, CharacterCreationDate: string)

IC: {AccountNumber,CharacterName} (Primary key) not null, Foreign key AccountNumber references Player ON DELETE CASCADE, Foreign key {AccountNumber,CharacterName} references BattlePartakeIn, Foreign key {AccountNumber,CharacterName} references InventoryItems, AccountNumber not null, CharacterName not null, Health not null, AttackinScore not null, DefenceScore not null, CharacterCreationDate not null.

The normalisation level for this is first normal form as every attribute is atomic, but Health attribute could repeat so one Player may have accountNumber of 1 and CharacterName Steven, with Health 100, another player may also have Health of 100, so not every attribute of the relation depends on the primary key.

BattlePartakeIn(BattleNo: integer, AccountNumber: integer, CharacterName: string)

IC:{BattleNo,AccountNumber,CharacterName} (Primary Key) not null, AccountNumber not null, CharacterName not null, BattleNo not null, Foreign key {AccountNumber,CharacterName} references Battles.

Is in first normal form since every attribute is atomic, there does not exist a non-prime attribute that is partially implied by part of a key in the candidate key (so is 2nd NF), no functional dependencies since is all a primary key, so it is in 3rd Normal form.

Battles(BattleNo: integer, AccountNumber: integer, CharacterName: string, Attacker: string, Weapon: string, Defender: string, Damage: integer, Result: string)

IC: BattleNo (Primary key) not null, AccountNumber not null, CharacterName not null ,Weapon not null, Attacker not null, Defender not null, Damage not null, Result not null.

First normal form, since every attribute is atomic, however not in 2nd normal form since can have same character attacking and same character defending with same result and damage, these attributes will not depend on the primary key.

InventoryItems(AccountNumber: integer, CharacterName: string, Item: string, ItemType: string, WeaponType: string, Range: integer, Quantity: integer, DefenseScore: integer ,AttackScore: integer, HealingScore: integer, ManaScore: integer, BodyPart: string)

IC: {AccountNumber, CharacterName, Item} is a primary key not null, AccountNumber not null, CharacterName not null, Item not null, ItemType is not null, Quantity is not null.

The normalisation level for this is first normal form, since every attribute is atomic but attributes such as Quantity will not depend on the primary key, as quantity can be duplicated, so it is not in 2nd normal form.

DDL Statements

CREATE TABLE Players(AccountNumber Integer NOT NULL, Forename text not null, Surname text, EmailAddress text not null,

Primary key(AccountNumber))

CREATE TABLE CharacterOwn(AccountNumber integer not null, CharacterName text not null, Health integer not null, AttackinScore integer not null, DefenceScore integer not null, ManaScore int, CharacterCreationDate text not null, CharacterExpiryDate text, Primary Key(AccountNumber, CharacterName), Foreign Key(AccountNumber) references Players(AccountNumber) ON DELETE CASCADE, Foreign key(AccountNumber,CharacterName) references BattlePartakeIn(AccountNumber,CharacterName), Foreign key(AccountNumber,CharacterName) references InventoryItems(AccountNumber,CharacterName).

CREATE TABLE BattlePartakeIn(BattleNo integer not null, AccountNumber integer not null, CharacterName text not null, Primary key(BattleNo, AccountNumber, CharacterName) ,FOREIGN KEY(AccountNumber,CharacterName) references Battles(AccountNumber,CharacterName))

CREATE TABLE Battles(BattleNo integer autoincrement not null, AccountNumber integer not null, Attacker text not null , Weapon text not null, Defender text not null, Damage integer not null, Result text not null,

PRIMARY KEY(BattleNo))

CREATE TABLE InventoryItems(AccountNumber integer not null, CharacterName text not null, Item text not null, ItemType text not null, WeaponType text, Range integer, Quantity integer not null, DefenseScore integer, AttackScore integer, HealingScore integer, ManaScore integer, BodyPart text,

Primary Key(AccountNumber, CharacterName, Item))