

## Assignment 2A

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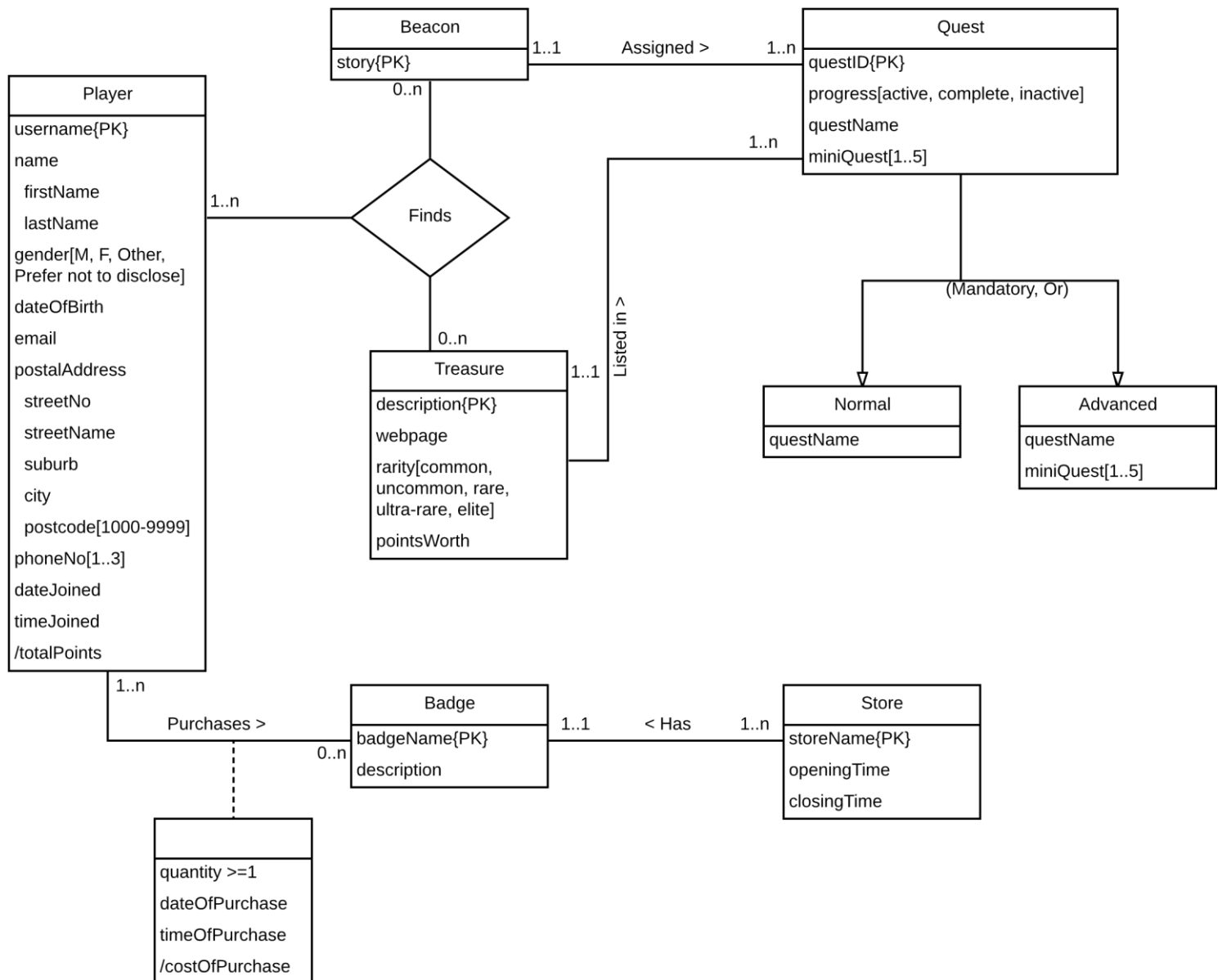
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Tutor

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Task 1: ERD for *Treasure Hunter***Assumptions:**

- Players can only have one active quest at a time.
- Players can go on the same quest.
- costOfPurchase is derived because the badges change prices depending on popularity/demand. It is assumed that the store decides on price.
- A player can purchase multiple of the same badge at a time.
- totalPoints is derived because the value is constantly changing because of purchases and treasure rewards.
- A Quest must either be Normal or Advanced.
- Multiple players can find the same treasure.
- Each store can have multiple of the same badge.
- miniQuests has the same inherits attributes in Quest and Advanced.

### TASK 2 QUESTION 1:

**Player** (username, firstName, lastName, gender, dateOfBirth, email, streetNo, streetName, suburb, city, postcode, phoneNo, dateJoined, timeJoined, /totalPoints)

**Quest** (questID, questName, progress, miniQuest)

**Beacon** (story)

**Treasure** (description, webpage, rarity, pointsWorth)

### TASK 2 QUESTION 2:

**CurrentQuest** is a new relation derived from Entity Type(**Player**), Entity Type(**Quest**) and Entity Type(**Beacon**), due to the multiplicity Many-to-Many.

**PhoneNumbers** is derived from the Entity Type(**Player**) with the attribute of phoneNo1, phoneNo2, phoneNo3, as having the Foreign Key(**username**) from **Player** entity.

**PlayerAddress** is derived from the Entity Type(**Player**) with the attribute of streetNo, streetName, suburb, city, postcode, as having the Foreign Key(**username**) from **Player** entity.

**TreasureFound** is derived from the Entity Type(**Player**) and Entity Type(**Treasure**), due to the multiplicity Many-to-many.

### TASK 2 QUESTION 3:

**Player** (username, firstName, lastName, gender, dateOfBirth, email, dateJoined, timeJoined, /totalPoints)

**PlayerAddress** (username, streetNo, streetName, suburb, city, postcode)

**PhoneNumbers** (phoneNumber, username)

**Beacon** (story, username)

**Quest** (questID, questName, progress, miniQuest, story, description)

**Current Quest** (username, story, questID, questName, progress)

**Treasure** (description, webpage, rarity, pointsWorth)

**TreasureFound** (username, description, quantity)

**Badge** (badgeName, description)

**Store** (storeName, openingTime, closingTime, badgeName)

**PurchaseDetails** (storeName, quantity, dateOfPurchase, timeOfPurchase, username, /costOfPurchase)

## TASK 2 QUESTION 4:

**Primary Keys:** Attributes underlined in Task 2 Question 3.

### Foreign Keys

- **PhoneNumbers** (username) is dependent on **Player**(username)
- **PlayerAddress**(username) is dependent on **Player**(username)
- **Beacon** (username) is dependent on **Player** (username)
- **Quest** (story) is dependent on **Beacon**(story)
- **Quest** (description) is dependent on **Treasure**(story)
- **PurchaseDetails**(storeName) is dependent on **Store**(storeName)
- **PurchaseDetails**(username) is dependent on **Player**(username)
- **PurchaseDetails**(badgeName) is dependent on **Badge**(badgeName)
- **Store**(badgeName) is dependent on **Badge**(badgeName)
- **CurrentQuest**(username) is dependent on **Player**(username)
- **CurrentQuest**(story) is dependent on **Beacon**(story)
- **CurrentQuest**(questID) is dependent on **Player**(username)
- **TreasureFound**(username) is dependent on **Player**(username)
- **TreasureFound**(description) is dependent on **Treasure**(description)

### Constraints

- No NULL value in the Primary Keys.
- No duplicate value in Primary keys.
- New tuples must match existing Primary Key value.
- Cannot Insert a tuple without value in Foreign Keys.
- Each username is unique. Multiple players cannot have the same username.
- Each phoneNumber is unique.
- Each questID is unique. All quests have different IDs.
- Each storeName is unique.
- Each treasure(description) is unique.
- Each badgeName is unique.
- Multiple players can have the same quest.
- The domain of progress can only be either [active, complete or inactive].
- The domain of gender can only be either [M, F, other or prefer not to disclose].
- The domain of rarity can only be one of the following: [common, uncommon, rare, ultra-rare, elite].
- The pointsWorth should always be more than zero.
- Quantity should always be more than zero.
- The badge price should always be more than zero.
- Players can have up to 3 phone numbers.
- dateJoined and timeJoined cannot be in the future.
- dateJoined is in 00/00/00 format
- timeJoined is in 00:00 24hr format
- dateOfPurchase and timeOfPurchase cannot be in the future

## TASK 3 SAMPLE DATA:

**Player**

<u>Username</u>	firstName	lastName	gender	DOB	email	dateJoined	timeJoined	totalPoints
NorthKing	Jon	Snow	M	23/4/1996	imastark@hotmail.com	17/04/2011	13:20	124
BendTheKnee	Daenerys	Targaryen	F	24/4/1996	unburnt@gmail.com	17/04/2011	14:30	435
littleMonstah	Tyrion	Lannister	M	8/4/1996	tyrionlann@yahoo.com	17/04/2011	16:10	234
FaceLess	Arya	Stark	F	34/4/1996	senseiJaen@hotmail.com	17/04/2011	18:40	456

**PlayerAddress**

<u>Username</u>	streetNo	streetName	suburb	city	postcode
NorthKing	24	Bryant	Philly	Winterfell	2345
BendTheKnee	34	Shaq	Jersey	Dragonstone	2346
littleMonstah	23	Jordan	Brook	Landing	2347
FaceLess	3	Iverson	Hamp	Bravos	2348

**PhoneNumbers**

<u>phoneNumber</u>	username
0423734954	NorthKing
0434579435	BendTheKnee
0467802060	littleMonstah
0412375670	FaceLess

**Beacon**

<u>story</u>	username
Joffrey has been making unjust decisions...	NorthKing BendTheKnee
The zombies are approaching, they are too fast and it seems likely the people won't make it...	Faceless
Realizing the Queen's madness, her Knight acts upon his decisions...	littleMonstah FaceLess
After Vee got captured, the enemies make their move, they approach the land...	FaceLess

**Quest**

<u>questID</u>	story	questName	progress	miniQuest	description
Q1	Joffrey has been making unjust decisions...	Stop the Child King	Complete	2	Flawed Emerald
Q2	The zombies are approaching, they are too fast and it seems likely the people won't make it...	Hold the door	Complete	3	Normal Ruby
Q3	Realizing the Queen's madness, her Knight acts upon his decisions...	Escape from the Castle	Inactive	1	Flawless Ruby
Q4	After Vee got captured, the enemies make their move, they approach the land...	Defend the wall	Active	4	Perfect Diamond

**Current Quest**

Username	story	questID	questName	progress
NorthKing	Joffrey has been making unjust decisions...	Q1	Stop the Child King	Complete
	The zombies are approaching, they are too fast and it seems likely the people won't make it...	Q2	Hold the door	Active
BendTheKnee	Joffrey has been making unjust decisions...	Q1	Stop the Child King	Complete
	Realizing the Queen's madness, her Knight acts upon his decisions...	Q3	Escape from the Castle	Complete
littleMonstah	Realizing the Queen's madness, her Knight acts upon his decisions...	Q3	Escape from the Castle	Inactive
	After Vee got captured, the enemies make their move, they approach the land...	Q4	Defend the wall	Active
FaceLess	After Vee got captured, the enemies make their move, they approach the land...	Q4	Defend the wall	Inactive
	Joffrey has been making unjust decisions...	Q1	Stop the Child King	Complete
	The zombies are approaching, they are too fast and it seems likely the people won't make it...	Q2	Hold the door	Active

**Treasure**

Description	Webpage	Rarity	pointsWorth
Flawed Emerald	<a href="http://flawedE.com/asdgrr/qaz">flawedE.com/asdgrr/qaz</a>	Uncommon	10
Normal Ruby	<a href="http://normal.com.au/apqi/dcias">normal.com.au/apqi/dcias</a>	Common	5
Flawless Ruby	<a href="http://flawlessR.com.eu/oqvn">flawlessR.com.eu/oqvn</a>	Rare	15
Perfect Diamond	<a href="http://perfectD.com/qyba">perfectD.com/qyba</a>	Elite	30

**TreasureFound**

Username	Description	quantity
NorthKing	Flawed Emeral	1
BendTheKnee	Normal Ruby	5
FaceLess	Flawless Ruby	4
littleMonstah	Flawed Emerald	3

**Badge**

badgeName	description
Deadshot	Increases accuracy by 30%
Vampyr	Increases lifesteal at night by 50%
Asgard Sigil	Allows player to fly, increases speed by 30%
Vibranium	Increases Block Chance by 70%

**Store**

storeName	openingTime	closingTime	badgeName
Big W	9:00	15:00	Deadshot Asgard Sigil
Kmart	10:00	16:00	Vampyr Asgard Sigil Deadshot
Warehouse	8:00	16:00	Deadshot Vampyr
Amart	17:00	23:00	Deadshot Vibranium



### Purchase Details

storeName	Username	badgeName	Quantity	dateOfPurchase	timeOfPurchase	/costOfPurchase
Big W	BendTheKnee	Deadshot	3	17/02/17	10:00	1000
Amart	NorthKing	Vampyr	1	20/04/16	19:00	2000
Kmart	littleMonstah	Asgard Sigil	2	03/08/17	12:00	3000
Warehouse	FaceLess	Vibranium	4	25/09/17	9:00	5000

**TASK 3 SUCCESSFUL DELETE OPERATION: (Delete Red Font)****CurrentQuest**

Username	story	questID	questName	progress
NorthKing	Joffrey has been making unjust decisions...	Q1	Stop the Child King	Complete
	The zombies are approaching, they are too fast and it seems likely the people won't make it...	Q2	Hold the door	Active
BendTheKnee	Joffrey has been making unjust decisions...	Q1	Stop the Child King	Complete
	Realizing the Queen's madness, her Knight acts upon his decisions...	Q3	Escape from the Castle	Complete
littleMonstah	Realizing the Queen's madness, her Knight acts upon his decisions...	Q3	Escape from the Castle	Inactive
	After Vee got captured, the enemies make their move, they approach the land...	Q4	Defend the wall	Active
FaceLess	After Vee got captured, the enemies make their move, they approach the land...	Q4	Defend the wall	Inactive
	Joffrey has been making unjust decisions...	Q1	Stop the Child King	Complete
	The zombies are approaching, they are too fast and it seems likely the people won't make it...	Q2	Hold the door	Active

**Reason:** This tuple can be deleted because it is not a part of a parent/home entity. The foreign keys are dependent on the Primary Keys in another entity, therefore not violating the Referential Integrity Constraint.

**TASK 3 SUCCESSFUL UPDATE OPERATION:****PlayerAddress**

<u>Username</u>	streetNo	streetName	suburb	city	postcode
NorthKing	24	Bryant	Philly	Winterfell	2345
BendTheKnee	34	Shaq	Jersey	Dragonstone	2346
littleMonstah	23	Jordan	Brook	Landing	2347
FaceLess	3	Iverson	Hamp	Bravos	2348

**PlayerAddress**

<u>Username</u>	streetNo	streetName	suburb	city	postcode
NorthKing	24	Garnett	Carol	Winterfell	2345
BendTheKnee	34	Shaq	Jersey	Dragonstone	2346
littleMonstah	23	Jordan	Brook	Landing	2347
FaceLess	3	Iverson	Hamp	Bravos	2348

**Reason:** These 2 attributes can be updated because they are not a foreign key that would be subject to a Primary Key Constraint.

**TASK 3 UNSUCCESSFUL UPDATE OPERATION.****Store**

<u>storeName</u>	openingTime	closingTime	badgeName
Big W	9:00	15:00	Deadshot Asgard Sigil
Kmart	10:00	16:00	Vampyr Asgard Sigil Deadshot
Warehouse	8:00	16:00	Deadshot Vampyr
Amart	17:00	23:00	Deadshot Krypton Suit

**Badge**

<u>badgeName</u>	description
Deadshot	Increases accuracy by 30%
Vampyr	Increases lifesteal at night by 50%
Asgard Sigil	Allows player to fly, increases speed by 30%
Vibranium	Increases Block Chance by 70%

**Reason:** This update operation would not run successfully because it violates Referential Integrity Constraint. You cannot add a badge to a store that does NOT exist.

**TASK 3 UNSUCCESSFUL INSERT OPERAITON.****PhoneNumbers**

<u>phoneNumber</u>	username
0423734954	NorthKing
0434579435	BendTheKnee
0467802060	littleMonstah
0412375670	FaceLess
0490234785	NULL

**Player**

<u>Username</u>	firstName	lastName	gender	DOB	email	dateJoined	timeJoined	totalPoints
NorthKing	Jon	Snow	M	23/4/1996	imastark@hotmail.com	17/04/2011	13:20	
BendTheKnee	Daenerys	Targaryen	F	24/4/1996	unburnt@gmail.com	17/04/2011	14:30	
littleMonstah	Tyrion	Lannister	M	8/4/1996	tyrionlann@yahoo.com	17/04/2011	16:10	
FaceLess	Arya	Stark	F	34/4/1996	senseiJaen@hotmail.com	17/04/2011	18:40	

**Reason:** This insert operation would not run successfully because the entity MUST exist. This violates Entity Integrity Constraint. A non-existing player cannot have a phoneNumber.

#### TASK 4:

**Player** is in 0NF because 2 tuples have multiple values in one column therefore having repeating groups.

**Treasure** is in 1NF because there is only one value per intersection of a tuple and a column. However, it does NOT meet 2NF because there are non-primary attributes that isn't fully dependent on a primary key. Quest name and Beacon can be determined by Name or Quest\_id.

**Address** is in 2NF because all non-primary attributes are fully dependent on ID. There are no other primary attribute that determines street number, street name, city and postcode other than ID.