CSCI 4333.1 Design of Database Systems Spring 2017

Suggested Solution for HW #9 Question 1.

This is a sample design. Other reasonable designs are acceptable.

The relation schema:

Main_CT_Since	1 Swimmer(SwimmerId, FName, LName, Phone, Email, JoinTime, CurrentLevelId, Main_CT_Id,		
Foreign Keys [1] Main_CT_Id references CareTaker(CT_Id), [2] CurrentLevelld references Level(LevelId). Notes [1] The relationship "Main Caretaker" is implemented as two attributes Main_CT_Id and Main_CT_Since. It is also acceptable to use a separate relation to implement the relationship. [2] CurrentLevelId is a derived column that can be obtained from the table LevelHistory. Normalization Analysis FD: (1) SwimmerId -> FName, LName, Phone, Email, JoinTime, CurrentLevelId, Main_CT_Since Highest NF: BCNF 2		1416	
Level(LevelId). Nullable Attributes Notes [1] The relationship "Main Caretaker" is implemented as two attributes Main_CT_Id and Main_CT_Since. It is also acceptable to use a separate relation to implement the relationship. [2] CurrentLevelId is a derived column that can be obtained from the table LevelHistory. Normalization Analysis [5] [1] SwimmerId -> FName, LName, Phone, Email, JoinTime, CurrentLevelId, Main_CT_Id, Main_CT_Since Highest NF: BCNF 2			
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Highest NF: BCNF 2	Normalization Analysis		
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Candidate Keys [1] LH_Id, [2] SwimmerId, LevelId	5 LevelHistory(<u>LH_Id</u> , SwimmerId, LevelId, StartDate, Comment)		
,			
	Foreign Keys		

	Level(LevelId).	
Nullable Attributes	Comment	
Notes	(1) A surrogate key, LH_Id, is created as the primary key. This is optional.	
Normalization Analysis	FD: (1) LH_Id -> SwimmerId, LevelId, StartDate, Comment; (2) SwimmerId,	
,	LevelId -> LH Id}	
	Highest NF: BCNF	
6 Coach(CoachId, FNar	ne, LName, Phone, Email)	
Candidate Keys	(1) Coachid	
Foreign Keys		
Nullable Attributes		
Notes		
Normalization Analysis	FD: (1) Coachid -> FName, LName, Phone, Email	
,	Highest NF: BCNF	
7 Meet(MeetID, Title,	Date, StartTime, EndTIme, Venueld, CoachId)	
Candidate Keys	[1] Meetld	
Foreign Keys	[1] Coachid references Coach(Coachid), [2] Venueld references	
	Venue(Venueld)	
Nullable Attributes		
Notes		
Normalization Analysis	FD: (1) MeetID -> Title, Date, StartTime, EndTIme, Venueld, CoachId	
, , , , , , , , , , , , , , , , , , , ,	Highest NF: BCNF	
8 Venue(Venueld, Nam	ne, Address, City, State, ZipCode, Phone)	
Candidate Keys	[1] Venueld, [2] Name (likely), [3] {Address, City, State, ZipCode} (likely)	
Foreign Keys		
Nullable Attributes		
Notes		
Normalization Analysis	FD: (1) Venueld -> Name, Address, City, State, ZipCode, Phone; (2) Name ->	
,	Venueld (likely), (3) Address, City, State, ZipCode -> Venueld (likely)	
	Highest NF: BCNF	
9 Event(EventId, Title, StartTime, EndTime, MeetId, LevelId)		
Candidate Keys	[1] EventId	
Foreign Keys	[1] Meetid references Meet(Meetid), [2] Levelid references Level(Levelid).	
Nullable Attributes		
Notes		
Normalization Analysis	FD: (1) EventId -> Title, StartTime, EndTime, MeetId, LevelId	
,	Highest NF: BCNF	
10 Participation(Particip	pationId, SwimmerId, EventId, Committed, CommitTime, Participated, Result,	
Comment, Comment		
Candidate Keys	[1] ParticipationId, [2] SwimmerId, EventId.	
Foreign Keys	[1] SwimmerId references Swimmer(SwimmerId), [2] EventId references	
- 0 - 1,	Event(EventId), [3] CommentCoachId references Coach(CoachId)	
Nullable Attributes	Committed, CommitTime, Participated, Result, Comment, CommentCoachId	
Notes	(1) A surrogate key, ParticipationId, is created as the primary key. It is	
	optional.	
Normalization Analysis	FD: (1) ParticipationId -> SwimmerId, EventId, Committed, CommitTime,	
	Participated, Result, Comment, CommentCoachId, (2) SwimmerId, EventId -	
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	> ParticipationId	
	Highest NF: BCNF	
11 V_TaskList(VTL_Id, MeetId, Required, Description, Penalty, PenaltyAmt)		
Candidate Keys	[1] VTL_Id, [2] MeetId	
Foreign Keys	[1] MeetId references Meet(MeetId)	
Nullable Attributes	Penalty, PenaltyAmt	
Notes	[1] A surrogate key, VTL_Id, is created as the primary key.	
Normalization Analysis	FD: (1) VTL Id -> MeetId, Required, Description, Penalty, PenaltyAmt; (2)	
Normanzacion Analysis	MeetId -> VTL Id	
	Highest NF: BCNF	
12 V Task(VT Id. VTL Id	, Name, Comment, Num V)	
Candidate Keys	[1] VT_Id, [2] {VTL_Id, Name} (likely)	
Foreign Keys	[1] VTL Id references V TaskList(VTL Id)	
Nullable Attributes	Comment (possibly)	
Notes	[1] A surrogate key, VT_Id, is created as the primary key. [2] Num_V is not	
	nullable and has a default value of 1.	
Normalization Analysis	FD: (1) VT_Id, VTL_Id, Name, Comment, Num_V; (2) VTL_Id, Name -> VT_Id	
,	Highest NF: BCNF	
13 Commitment(CommitmentId, CT_Id, VT_Id, CommitTime, Rescinded, RescindTime, CarriedOut,		
Comment, CommentCoachId)		
Candidate Keys	[1] CommitmentId, [2] {CT_ID, VT_Id}	
Foreign Keys	[1] CT_Id references Caretaker(CT_Id), [2] VT_Id references V_Task(VT_Id),	
	[3] CommentCoachId references Coach(CoachId)	
Nullable Attributes	Rescinded, RescindTime, CarriedOut, Comment, CommentCoachId	
Notes	[1] A surrogate key, CommitmentId, is created as the primary key.	
Normalization Analysis	FD: (1) CommitmentId -> CT_Id, VT_Id, CommitTime, Rescinded,	
	RescindTime, CarriedOut, Comment, CommentCoachId; (2) CT_Id, VT_Id ->	
	CommitmentId	
	Highest NF: BCNF	