CSCI 5333 DBMS
Spring 2020

Solution for HW #2

You may have a different number of tables. Adjust accordingly.

The relation schema:

1	RoleLevel(RLNum, Definition)
Candidate Keys	[1] RLNum
Foreign Keys	
Nullable Attributes	
Non-nullable Attributes	RLNum, Definition
Notes	

2	Role(RoleId, RLNum)
Candidate Keys	[1] RoleId
Foreign Keys	[1] RLNum references RoleLevel(RLNum)
Nullable Attributes	
Non-nullable Attributes	
Notes	[1] RoleId is created as a surrogate primary key. [2] We used three relations to implement the three classes Role, UserDefinedRole and StandardRole. It is possible to use one relation.

3	UserDefinedRole(UDRId, URName, Description, CTime, RoleId, ManagerId)
Candidate Keys	[1] UDRId
Foreign Keys	[1] RoleId references Role(RoleId), [2] ManagerId references Manager(ManagerId)
Nullable Attributes	Description
Non-nullable Attributes	UDRId, URName, CTime, RoleId, ManagerId
Notes	[1] UDRId is created as a surrogate primary key.

4	StandardRole(SRId, SRName, RoleId)
Candidate Keys	[1] SRId, [2] SRName
Foreign Keys	[1] RoleId references Role(RoleId)
Nullable Attributes	
Non-nullable Attributes	SRId, SRName, RoleId
Notes	[1] SRId is created as a surrogate primary key.

5	Status(StatusId, SName, StatusType, Definition, Abbreviation, Description)
Candidate Keys	[1] StatusId
Foreign Keys	
Nullable Attributes	Definition, Abbreviation, Description
Non-nullable Attributes	StatusId, SName, StatusType,
Notes	[1] In this design, one relation is used to implement the superclass Status, and its two subclasses, UserDefinedStatus and StandardStatus. The attribute StatusType is added to distinguish between user-defined status and standard status. When it is equal to 'user-defined', the attribute Description may be non-null. When it is equal to 'standard', the attributes

	Definition and Abbreviation must have values. [2] Using three relations as an alternative is acceptable.
6	Account(Username, Password)
Candidate Keys	[1] Username
Foreign Keys	
Nullable Attributes	
Non-nullable Attributes	Username, Password
Notes	
7	Member(MemberId, LName, FName, ScreenName, StartTime, EMail, ReferrerMemberId, Username)
Candidate Keys	[1] MemberId, [2] ScreenName
Foreign Keys	[1] ReferrerMemberId references Member(MemberId), [2] Username references Account(Username)
Nullable Attributes	
Non-nullable Attributes	MemberId, LName, FName, ScreenName, StartTime, EMail, RefererMemberId
Notes	
8	Project(ProjectId, PName, Description, Logo, Since, OwnerMemberId)
Candidate Keys	[1] ProjectId
Foreign Keys	[1] OwnerMemberId references Member(MemberId)
Nullable Attributes	
Non-nullable Attributes	ProjectId, PName, Description, Logo, Since, OwnerMemberId
Notes	
9	Manager(ManagerId, MemberId, ProjectId)
Candidate Keys	[1] ManagerId, [2] MemberId, ProjectId
Foreign Keys	[1] MemberId references Member(MemberId), [2] ProjectId references Project(ProjectId)
Nullable Attributes	
Non-nullable Attributes	ManagerId, MemberId, ProjectId
Notes	[1] ManagerId is created as a surrogate primary key.
10	ProjMember(PMId, MemberId, ProjectId)
Candidate Keys	[1] PMId, [2] MemberId, ProjectId
Foreign Keys	[1] MemberId references Member(MemberId), [2] ProjectId references Project(ProjectId)
Nullable Attributes	
Non-nullable Attributes	PMId, MemberId, ProjectId
Notes	[1] PJId is created as a surrogate primary key.
11	ProjMemberRole(PMRId, PMId, RoleId)
Candidate Keys	[1] PMRId, [2] PMId, RoleId
Foreign Keys	[1] PMId references ProjMember(PMId), [2] RoleId references Role(RoleId)
Nullable Attributes	
Non-nullable Attributes	PMRId, PMId, RoleId
Notes	[1] PMRId is created as a surrogate primary key.
12	Task(TaskId, TName, Description, ExpCompTime, ActCompTime, CurrentStatusId, ParentTaskId, ProjectId, CreatorPMId, AssigneePMId)
Candidate Keys	[1] TaskId

Foreign Keys	[1] CurrentStatusId references Status(StatusId), [2] CreatorPMId references ProjMember(PMId), [3] AssigneePMId references ProjMember(PMId), [4] ParentTaskId references Task(TaskId), [5] ProjectId references Project(ProjectId)
Nullable Attributes	CurrentStatusId, ParentTaskId, AssigneePMId
Non-nullable Attributes	TaskId, TName, Description, ExpCompTime, ActCompTime, ProjectId, CreatorPMId,
Notes	[1] The derived attribute CurrentStatusId is implemented as a foreign key.

13	TaskStatus(TSId, TaskId, StatusId, TSTime)
Candidate Keys	[1] TSId, [2] TaskId, StatusId
Foreign Keys	[1] TaskId references Task(TaskId), [2] StatusId references Status(StatusId)
Nullable Attributes	
Non-nullable Attributes	TSId, TaskId, StatusId, TSTime
Notes	[1] TSId is created as a surrogate primary key.

14	
Candidate Keys	
Foreign Keys	
Nullable Attributes	
Non-nullable Attributes	
Notes	

15	
Candidate Keys	
Foreign Keys	
Nullable Attributes	
Non-nullable Attributes	
Notes	

16	
Candidate Keys	
Foreign Keys	
Nullable Attributes	
Non-nullable Attributes	
Notes	

17	
Candidate Keys	
Foreign Keys	
Nullable Attributes	
Non-nullable Attributes	
Notes	