**CSCI 5333.4 DBMS**

**Suggested Solution for HW #2**

This is a faithful design but other reasonable designs are acceptable.

The relation schema:

[1] RegularUser(RU\_Id, UserId, SSNum, FirstName, MiddleInitial, LastName, OfficePhone, UnitCode)

Candidate keys: RU\_Id
Foreign keys:

* UserId (in Account): nullable
* UnitCode (in Unit): nullable

SSNum: unique but nullable

Notes:

* We select to flatten the inheritance structure of “Abstract User”. Other reasonable alternatives are accepted.

[2] Technician(Technician\_Id, UserId, SSNum, FirstName, MiddleInitial, LastName, OfficePhone, UnitCode)

Candidate keys: RU\_Id
Foreign keys:

* UserId (in Account): nullable
* UnitCode (in Unit): nullable

SSNum: unique but nullable

 [3] Administrator(Admin\_Id, UserId, SSNum, FirstName, MiddleInitial, LastName, OfficePhone, UnitCode)

Candidate keys: RU\_Id
Foreign keys:

* UserId (in Account): nullable
* UnitCode (in Unit): nullable

SSNum: unique but nullable

 [4] Account(UserId, Password, AccountTypeCode)

Candidate keys: UserId.
Foreign key: AccountTypeCode (in AccountType)

[5] Unit(UnitCode, UnitName, Phone, Head\_RU\_Id, Secretary\_RU\_Id, ParentUnitCode)

Candidate keys: UnitCode, UnitName.
Foreign keys:

* Head\_RU\_Id (RU\_Id in RegularUser): nullable
* Secretary\_RU\_Id (RU\_Id in RegularUser): nullable
* ParentUnitCode (UnitCode in Unit): nullable

[6] Priority(PriorityCode, PriorityName)

Candidate keys: PriorityCode, PriorityName

[7] Status(StatusCode, StatusName)

Candidate keys: StatusCode, StatusName

[8] ComputerConfiguration(CF\_Id, HDSize, RAMSize, OS\_Id)

Candidate Keys: CF\_Id
Foreign keys: OS\_Id (in OS): not nullable

[9] OS(OS\_Id, OSName, OSVersion)

Candidate key: OS\_Id

[10] SupportedSoftware(SS\_Id, SoftwareName, SoftwareVersion, OS\_Id)

Candidate keys: SS\_Id
Foreign keys: OS\_Id (in OS).

[11] TechnicianExpertise(TE\_Id, Technician\_Id, SS\_Id)

Candidate keys: TE\_Id, {Technician\_Id, SS\_Id}
Foreign keys:

* Technician\_Id (in Technician)
* SS\_Id (in SupportedSoftware)

[12] Computer(Computer\_Id, MacAddress, CF\_Id, GroupID)

Candidate keys: Computer\_Id
Foreign keys:

* CF\_Id (in ComputerConfiguration): not nullable)
* GroupID (in HomegeneousGroup): nullable

[12] HomegeneousGroup(GroupId, CF\_Id, ParentGroupId)

Candidate keys: GroupId
Foreign keys:

* CF\_Id (in ComputerConfiguration): not nullabl
* ParentGroupID (GroupId in HomegeneousGroup): nullable

Note: HeterogeneousGroup is not implemented.

[13] Work(WorkId, RequestId, SubmissionTime, StatusCode, PriorityCode, Technician\_Id, SS\_Id, ComputerId, GroupId)

Candidate key: WorkId

Foreign keys:

* RequestId (RU\_Id in RegularUser): nullable
* StatusCode (in Status)
* PriorityCode (in Priority): nullable
* Technician\_Id (in Technician): nullable
* SS\_Id (in SupportedSoftware): nullable
* ComputerId (in Computer): nullable
* GroupId (in HomogeneousGroup): nullable

[14] ProblemItem(PI\_Id, WorkId, SS\_Id, Description, Comment)

Candidate key: PI\_Id

Foreign keys:

* WorkId (in Work): not nullable
* SS\_Id (in SupportedSoftware)

[15] WorkProgress(WP\_Id, WorkId, ReportTime, Comment)

Candidate key: Wp\_Id

Foreign key: WorkId (in Work)