**DTA (M) Technical Report 2019** Wesley Scott 2460681S

**Task 1:**

STUDENT (SID, SNAME, HCID, HCNAME, TID, TNAME, JYEAR)

TOPIC(SID, ADVNAME, ADVID, TOPIC)

TEXTBOOK(COURSE, ADVID, TEXTBOOK)

**Task 1.1:**

*STUDENT*

FD1: SID > {SNAME, HCID, HCNAME}

FD2: HCID > HCNAME

FD3: TID > TNAME

FD4: SID, TID > JYEAR

*TOPIC*

FD1: SID > ADVID

FD2: ADVID > {ADVNAME, TOPIC}

*TEXTBOOK*

Each course has a set number of textbooks, these textbooks must be accounted for every time a course is referenced in TEXTBOOK.

To uniquely identify a tuple in this table currently we need the three attributes as PK.

FD1: COURSE, ADVID, TEXTBOOK

In order to normalise this table I will move forward with the view that

FD2: COURSE > TEXTBOOK

This would avoid unnecessary duplicates

Given that we make a new relation

COURSE\_ADVISOR(COURSE, ADVID)

**Task 1.2:**

In STUDENT: We have FD4 which states that join year to a team is defined by both the student ID and the team ID. We encounter an issue when a player joins more than one team within the same year, as we would not know the student’s current team. ???

In TOPIC: In topic we are told that an advisor can only cover one topic (FD2), so due to the database design, when inserting a new student with an advisor already present in the table, (see ADVID 1 (McReader)), we must duplicate information in this tables topic attribute. This means that if an Advisor were to change Topic we would have to update many tuples.

In TEXTBOOK: Due to the nature of the relationships of this table, where each Advior will use all of the necessary textbooks within a course, every time we insert a new ADVID against a course, we will require multiple tuples for each of the textbooks applicable to that course with the new Advisor.

**Task 1.3:**

2NF?

*STUDENT*

STUDENT(SID, SNAME, HCID, TID, JYEAR)

HOMECITY(HCID, HCNAME)

TEAM(TID, TNAME)

*TOPIC*

ADVISEE(SID, ADVID)

ADVISOR(ADVID, ADVNAME, TOPIC)

**Task 1.4:**

Due to the nature of the relationship in this table, where each Advisor will use all of the necessary textbooks within a course, every time we insert a new ADVID against a course, we will require multiple tuples for each of the textbooks applicable to that course.

**TEXTBOOK**  
  
TEXTBOOK(COURSE, ADVID, TEXTBOOK)

Therefore, I suggest a split of the table as follows, which can be further integrated and normalised with the other tables.

COURSE\_TEXTBOOK(COURSE, TEXTBOOK);

COURSE\_ADVISOR(ADVID, COURSE);