Timothy Mah
8750634
txamah001@mymail.sim.edu.sg

Task 2

```
R(courseCode, sessionNum, offeringDept, creditHours, courseLevel, lectNum, semester,
year, dayHours, roomNum, NumOfStudents)

courseCode                              → offeringDept, creditHours, courseLevel
courseCode, sessionNum, semester, year → dayHours, roomNum, NumOfStudents, lectNum
roomNum, dayHours, semester, year      → lectNum, courseCode, sessionNum
```

i) Determine what is the highest normal form the relational schema conforms to. Justify your choice.

ii) Your next task is to decompose the relational schema into the smallest number of relational schemas, and each of the relational schema is normalized.

Ans i):

encode to ABC

courseCode = A
sessionNum = B
offeringDept = C
creditHours = D
courseLevel = E
lectNum = F
semester = G
year = H
dayHours = I
roomNum = J
NumOfStudents = K

R(A,B,C,D,E,F,G,H,I,J,K)
A → CDE
ABGH → FIJK
JIGH → ABF

using closure:
{ABGH} = {ABCDEFGHIJK}

ABGH is MSK

Normal form check:
(1NF) any multi-value attributes? - No
(2NF) any partial dependencies? - Yes
A → CDE

R is in 1NF

Ans ii):

(2NF) remove partial dependencies
R1(ABGHFIJK) PK=ABGH
R2(ACDE) PK=A
R3(JIGHABF) PK=JIGH

Normal form check
(2NF) any partial dependencies? - No
(3NF) any transivitive dependencies? - No

decode back

```
R1 = (courseCode,offeringDept,creditHours,courseLevel)
PK = courseCode

R2 = (courseCode, sessionNum, semester, year, lectNum,
dayHours, roomNum, NumOfStudents)
PK = courseCode, sessionNum, semester, year

R3 = (courseCode, sessionNum, semester, year, dayHours
lectNum, roomNum)
PK = roomNum, dayHours, semester, year
```