

# Homework 1 (W4111)

Jing Qian (jq2282)

## Part 2

### Notation:

dName := name of Department

cName := name of Course

sName := name of Student

dBirth := date of birth

cid := Course number

```
CREATE TABLE Department(  
    dName text,  
    address text,  
    PRIMARY KEY (dName)  
)
```

```
CREATE TABLE Course_Owned(  
    dName text NOT NULL,  
    cid int,  
    capacity int,  
    cName text,  
    PRIMARY KEY (dName, cid),  
    FOREIGN KEY (dName) REFERENCES Department  
        ON DELETE CASCADE  
)
```

```
CREATE TABLE Student(  
    UNI text,  
    sName text,  
    dName text,  
    dBirth date,  
    PRIMARY KEY (UNI),  
    FOREIGN KEY (dName) REFERENCES Department,  
    CHECK (today - dBirth >= 18)  
)
```

```
CREATE TABLE Graduate(
    UNI text,
    research_field text,
    PRIMARY KEY (UNI),
    FOREIGN KEY (UNI) REFERENCES students
)
```

```
CREATE TABLE Undergraduate(
    UNI text,
    concentration text,
    PRIMARY KEY (UNI),
    FOREIGN KEY (UNI) REFERENCES students
)
```

```
CREATE TABLE offeredIn_Term (
    cid int,
    dName text,
    semester text,
    year int,
    PRIMARY KEY (cid, dName, semester, year)
    FOREIGN KEY (cid, dName) REFERENCES Course
)
```

```
CREATE TABLE enrolls (
    UNI text,
    cid int,
    dName text,
    semester text,
    year int,
    PRIMARY KEY (UNI, cid, dName, semester, year)
    FOREIGN KEY (UNI) REFERENCES Students
    FOREIGN KEY (UNI, dName, semester, year) REFERENCES offeredIn_Term
)
```

There are two constraints could not be expressed in the relational schema above:

1. A student should be enrolled in at least one course per term.
2. There may be overlap problems in ISA, which means a student could be both undergraduate and graduate in this schema.