**PART 1: Edit *models.py* to create the necessary models**

from django.db import models

import datetime

from django.contrib.auth.models import User

1. Add the following models.

a. *Author*  with fields below:

**class** Author(models.Model):  
 firstname = models.CharField(max\_length=50)  
 lastname = models.CharField(max\_length=50)  
 birthdate = models.DateField()

age = models.IntegerField()

b. *Book*  with fields below:

**class** Book(models.Model):  
 title = models.CharField(max\_length=100)  
 author = models.ForeignKey(Author)

in\_stock = models.BooleanField(default=**True**)

c. *Student*  with fields below:

class Student(User):

PROVINCE\_CHOICES = (

('AB','Alberta'), # First value is stored in db, the second is descriptive

('MB', 'Manitoba'),

('ON', 'Ontario'),

('QC', 'Quebec'),

)

address = models.CharField(max\_length=100, null=True, blank=True)

city = models.CharField(max\_length=20, default='Windsor')

province=models.CharField(max\_length=2, choices=PROVINCE\_CHOICES, default='ON')

age = models.IntegerField()

2. Create db tables (make sure *myapp* is included under INSTALLED\_APPS in *settings.py*). See what happens after each step.

* 1. **Tools 🡪 Run manage.py Task…** (opens a window where you can type ***manage.py*** commands)
  2. In ***manage.py*** window: Type **makemigrations myapp** in dialog box.
  3. In ***manage.py*** window: Type **sqlmigrate myapp 0001** #Check latest file in *migrations* dir
  4. In ***manage.py*** window: Type **migrate**

3. Update db tables.

Add new table *Course* with fields: *course\_no (IntegerField), title (CharField), textbook* (*ForeignKey(Book)*) and *students* (*ManyToManyField(Student)*). Explicitly set *course\_no* to be the **primary key** for *Course*.

a. Add a new required field *numpages* to *Book* model, indicating the number of pages in the book.

b. Add a new ‘optional’ field *city* to *Author* model.

c. Remove field *age* from *Author*.

Run **makemigrations**, **sqlmigrate** and **migrate** again until there are no errors. What is the latest file in *migrations* dir? Open it and check its contents.

**PART 2: Enter data through Admin interface**

1. Update *admin.py* as follows:

**from django.contrib import admin**

**from .models import Author, Book, Course**

**# Register your models here.**

**admin.site.register(Author)**

**admin.site.register(Book)**

**admin.site.register(Course)**

2. Start your server and navigate to admin site (127.0.0.1:8000/admin).

3. Login using *superuser* name and password (from Lab #2).

4. Enter the books, authors and courses given in ***lab3data.txt*** through the admin interface. Write \_\_str\_\_ methods for each model.

5. In Python console import Django then models from *models.py*, then write queries to obtain the following information. Verify if your query generates the correct answer using *lab3data.txt*.

**import django**

**from myapp.models import Author, Book, Course, Student**

a. List all the *books* in the db.

b. List all the *authors* in the db.

c. List all the *courses* in the db.

6. Write queries to do the following.

a. List all *Authors* whose first name is ‘John’

b. List all *Books* whose has an author with first name is ‘John’

c. List all *Books* with the word ‘Networks’ in its *title*.

d. List all *Books* that have the word ‘Networks’ in its *title* and are used in a course

e. List all the *Courses* that use the book 'Python Programming'

f. List the *Authors* born after 1978

g. List the *Authors* born in January

h. List the *Courses* that use a book written by Alan Jones

i. List the *Books* currently in stock

j. List the *Books* written by Mary Hall

k. Get the first name of the *Author* of the textbook used in course 567.

l. List all students registered in course 567

m. List all the courses the Josh is registered in.

n. List the textbook used in the course that Luis is registered in

o. List all students with last name ‘James’.