Web Framework Development

Year 3 Computing
TU764 / TU860 / TU757

In-class Test
Semester 2 2024/25

Date of examination	Monday 24th March 2025
Time of assessment	14:00 – 16:00 The test duration is 2 hours
Location of assessment	Room BD025
Internal examiner(s)	Dr. Anh Duong Trinh

Instructions to candidates:

1	This is an **individual** test – all work should be your own. During the test you should NOT communicate with anyone apart from the lecturer (except medical / emergency circumstances).
2	NO communication with others is permitted (e.g. to NOT use phones, email, Google, etc.)
3	You may use your own laptop for this test. NOTE: You are responsible for the working conditions of your own device.
4	This is an open-book test. You may use lecture notes and lab materials to perform this test. You are NOT allowed to use online materials and generative AI tools during the test.
5	It is recommended that you answer the questions in the sequence they appear (Part A & B), since some questions rely on your work created in earlier questions.
6	The test is marked out of 100. Answer ALL questions.

PART A – Object-Oriented Programming (30 marks)

Using the last digit of your student number, please select your task topic from the table below:

	Class	Init Attributes
0 or 5	Vehicle	name, year, max_speed, mileage, colour
1 or 6	Pet	name, age, sex, petID, owner name
2 or 7	Staff	name, DoB, sex, staffID, address
3 or 8	House	house number, street, area, number of beds, price
4 or 9	Phone	brand, model, year, price, colour

Please perform following tasks:

A1.   Create a python file name **PartA.py**

A2.   Create a class representing your assigned with provided initialisation attributes

A3.   Write a method inside the class to print all the initialisation attributes

A4.   Write methods inside the class to update attributes (1 method per attribute). The updated value should be present as the method's parameter. Remember to perform the check of type compatibility of the attribute and the parameter value.

A5.   Create at least 1 child class of your main class with extra attributes. There are no restrictions to child classes, but they must be logically linked to the main class. E.g. if the main class is Number, the child classes can be Integer, Float, Double, NegativeNumber, PositiveNumber, etc.

A6.   Write a method to print all the attribute values of the child class(es) using OOP inheritance property.

A7.   Write methods the perform updates the value of extra attributes of the child class(es) with the same requirements as task A4.

A8.   Create at least 1 instance for the classes above (tasks A2 and A5) with correct initialisation.

A9.   Call the methods described in tasks A3 and A6.

A10.   Perform examples of tasks A4 and A7 (2 examples for each task) and show the results to prove that they work.

PART B – Unit Testing (30 marks)

Please use your programme of Part A to perform following tasks:

B1.   Create a python file named **PartB.py**

B2.   Write unit tests to test if an object is an instance of a class.

B3.   Write unit tests to test if an object is NOT an instance of a class.

B4.   Write unit tests to test if 2 objects are identical.

B5.   For task A4 write a set of unit tests to test if update methods work correctly.

B6.   Write a main function to run the tests of tasks B2 to B5.

PART C – Django Model Layer (30 marks)

You are provided with an ERD for car dealership.
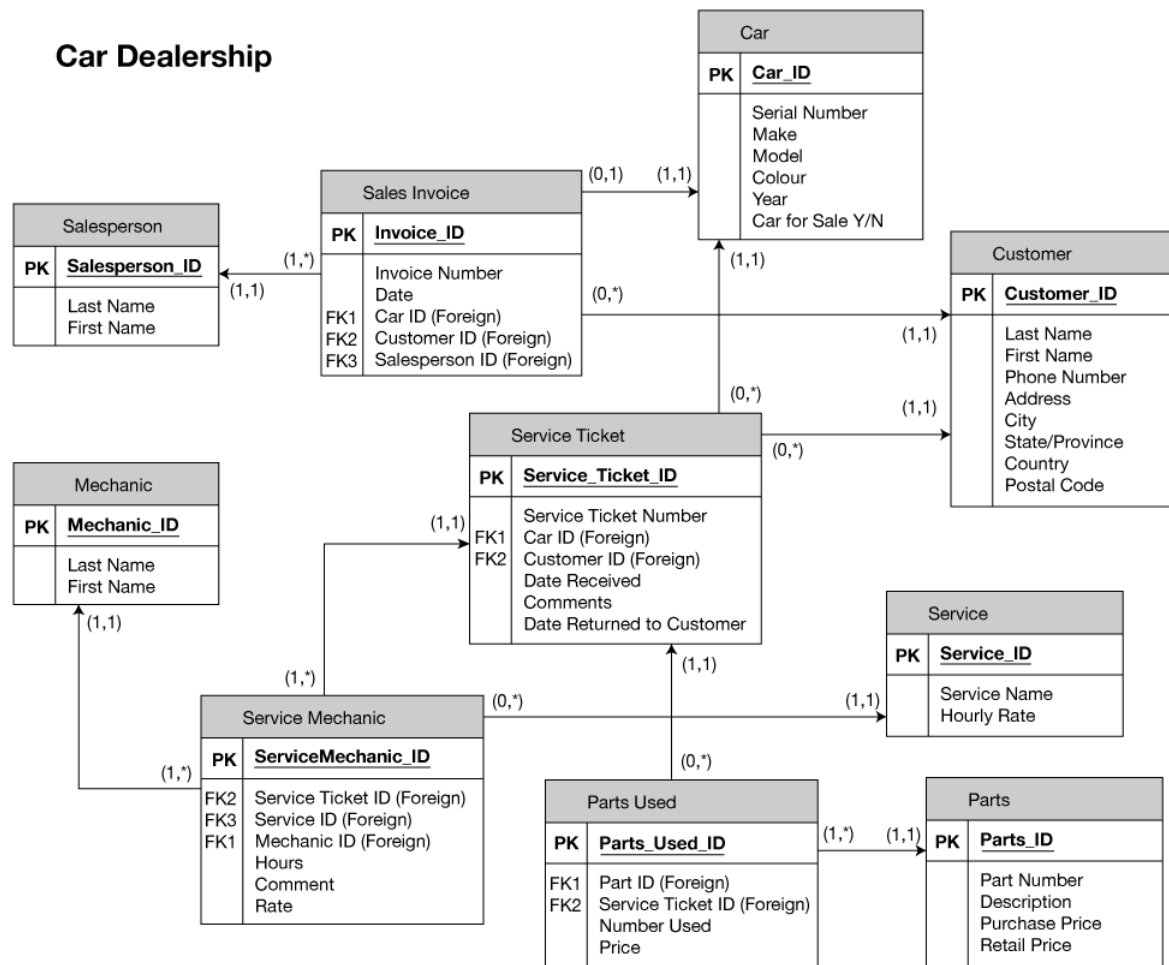
Please perform following tasks:

C1.   In your Django project please create **models.py**

C2.   Create models based on the ERD above.
       Pleas try your best to create as many models as possible. Each model correctly
       created will give you marks.

PART D – Github Commit / Push (10 marks)

Your Github submission must contain 3 files:
- PartA.py
- PartB.py
- models.py

Github commit / push with timestamps after the test time will **NOT** be accepted.

Github repository should be **public**.

The submission on Brightspace is a text file containing the URL to your Github repository.