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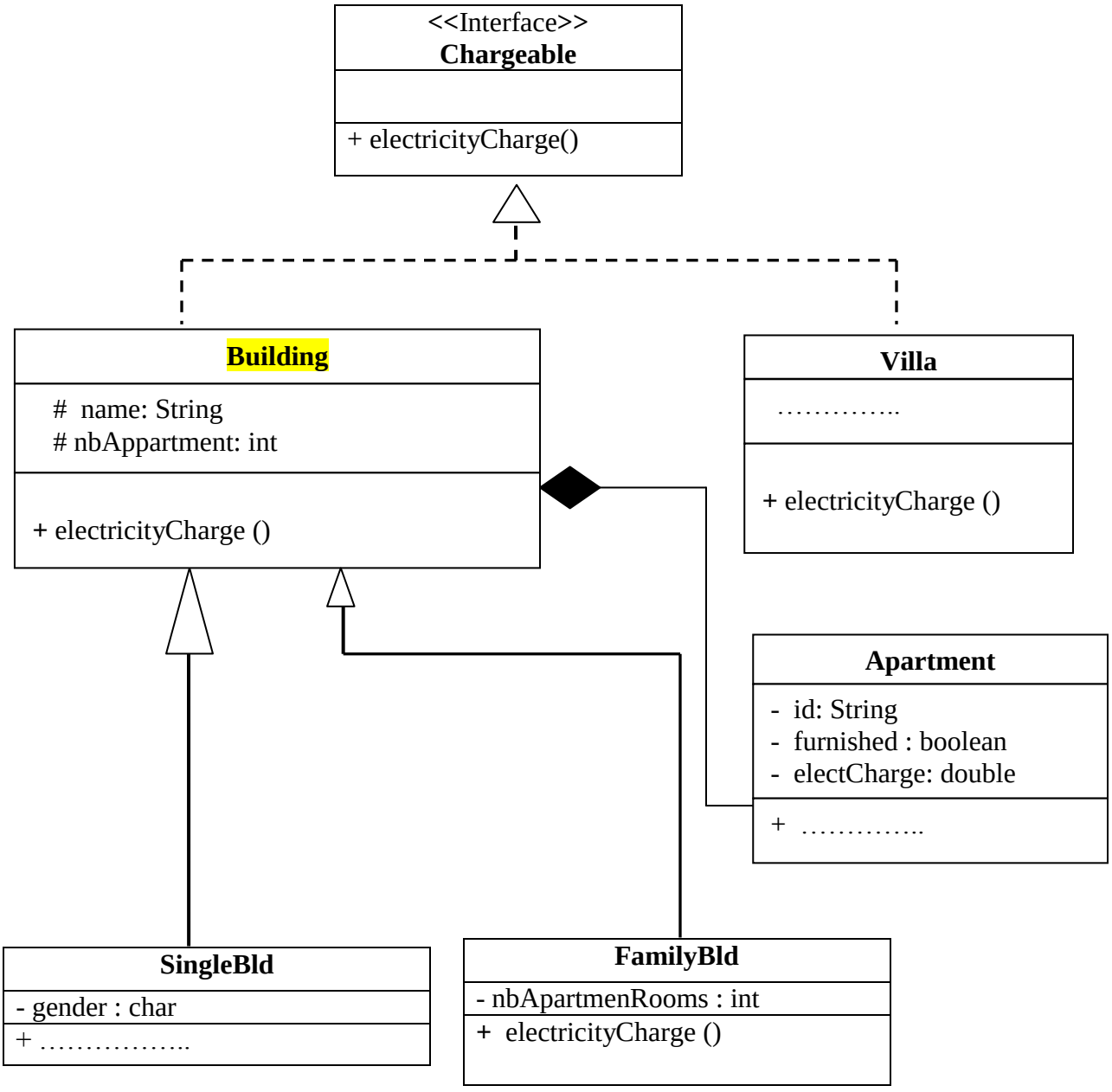
ID:	CSC113 MidTerm-2	Dr.

Question1: We want to manage the electricity charge invoice for buildings and villas. We consider the following UML diagram:



The interface **Chargeable** contains the following method:

- *electricityCharge*( )

The class **Building** contains the following attributes and methods:

- name : name of the building
- nbAppartment: number of the apartments in the building.
- *electricityCharge*( )

The concrete class **FamilyBld** contains the following attributes and methods:

- nbApartmenRooms: number of rooms in the apartment.
- *calculateCharge*( )
  This method returns the total electricity charge in family building using the following formula:

  Total electricity charge of all apartments – discount amount.

  Where *discount amount* is calculated as follows:
  If the number of rooms is greater than 3 then discount amount will be 5% of the total electricity charge of all apartments.

Write in Java the interface **Chargeable**, the abstract class **Building**, and the concrete class **FamilyBld** .

Note: You can call getters and setters without implementation. Assume that the other classes are implemented.

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Question 2:

We added the following methods to the class Building:

public void findAndStore(String filename, double amount)

This method stores in the file "*building.data*" all apartment objects having electricity charge less than *amount*.

public Apartment [ ] findFurnishedAndStore(String filename)

This method reads from the file "*building.data*" and returns an array containing all furnished apartment objects.

Write in Java the two methods ***findAndStore*** and ***findFurnishedAndStore.***

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Question 3:

A. we assume that all apartments in a building are stored in a linked list. Write a method to delete the apartment which consumes a high charge of electricity. (Delete only first occurrence. Traverse the list only once).

B. Consider the following Java program. Trace and write the output of the program.

```
public class Test
{
public static void main(String args[])
{

int numer[] = { 4, 8, 16, 32, 64, 128, 256, 512 };
int denom[] = { 2, 0, 4, 4, -1, 8 };

try
{

        for(int i=0; i<numer.length; i++)
        {
          try
            {
                System.out.println(numer[i] + " / " + denom[i] + " is " +numer[i]/denom[i]);
             }
                catch (ArithmeticException exc)
                {
                System.out.println("Can't divide by Zero!");
                }
        }
}catch (ArrayIndexOutOfBoundsException exc)
{
    System.out.println("Index out of bounds.");
    System.out.println("Fatal error .");
}
}
}
```