CS5800 Homework 03
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Link to GitHub Repo

Class Diagrams

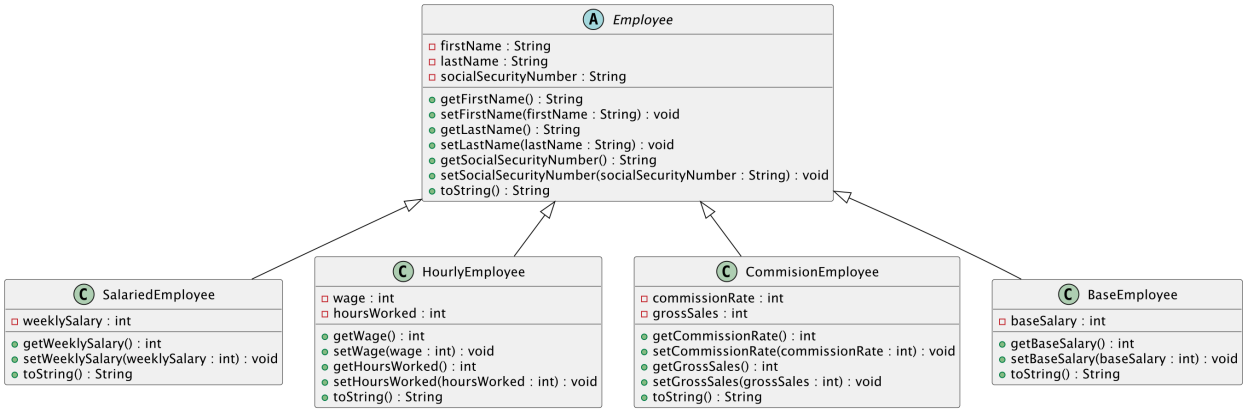
Part 1

Code

```
@startuml

abstract class Employee {
  -firstName : String
  -lastName : String
  -socialSecurityNumber : String
  +getFirstName() : String
  +setFirstName(firstName : String) : void
  +getLastName() : String
  +setLastName(lastName : String) : void
  +getSocialSecurityNumber() : String
  +setSocialSecurityNumber(socialSecurityNumber : String) : void
  +toString() : String
}

class SalariedEmployee {
  -weeklySalary : int
  +getWeeklySalary() : int
  +setWeeklySalary(weeklySalary : int) : void
  +toString() : String
}

class HourlyEmployee {
  -wage : int
  -hoursWorked : int
  +getWage() : int
  +setWage(wage : int) : void
  +getHoursWorked() : int
  +setHoursWorked(hoursWorked : int) : void
  +toString() : String
}

class CommisionEmployee {
  -commissionRate : int
  -grossSales : int
  +getCommissionRate() : int
  +setCommissionRate(commissionRate : int) : void
  +getGrossSales() : int
  +setGrossSales(grossSales : int) : void
  +toString() : String
}

class BaseEmployee {
```

```
  -baseSalary : int
  +getBaseSalary() : int
  +setBaseSalary(baseSalary : int) : void
  +toString() : String
}

Employee <|-- SalariedEmployee
Employee <|-- HourlyEmployee
Employee <|-- CommisionEmployee
Employee <|-- BaseEmployee

@enduml
```

Output

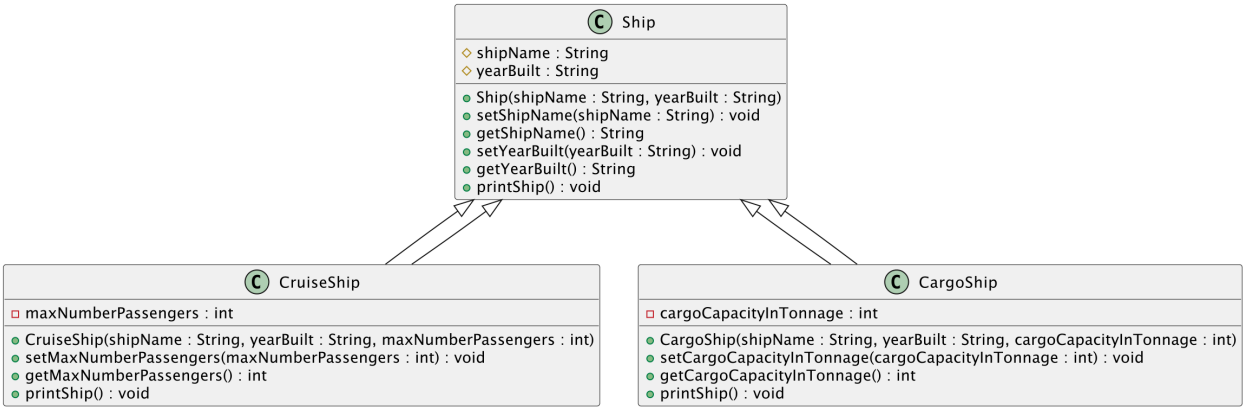


Part 2

Code

```
@startuml

' Definition for the base Ship class
class Ship {
    #shipName : String
    #yearBuilt : String

    +Ship(shipName : String, yearBuilt : String)
    +setShipName(shipName : String) : void
    +getShipName() : String
    +setYearBuilt(yearBuilt : String) : void
    +getYearBuilt() : String
    +printShip() : void
}

' Definition for the CruiseShip class that extends Ship
class CruiseShip extends Ship {
    -maxNumberPassengers : int

    +CruiseShip(shipName : String, yearBuilt : String, maxNumberPassengers :
int)
    +setMaxNumberPassengers(maxNumberPassengers : int) : void
    +getMaxNumberPassengers() : int
    +printShip() : void
}

' Definition for the CargoShip class that extends Ship
class CargoShip extends Ship {
    -cargoCapacityInTonnage : int

    +CargoShip(shipName : String, yearBuilt : String, cargoCapacityInTonnage
: int)
    +setCargoCapacityInTonnage(cargoCapacityInTonnage : int) : void
    +getCargoCapacityInTonnage() : int
    +printShip() : void
}

Ship <|-- CruiseShip
Ship <|-- CargoShip

@enduml
```

Output

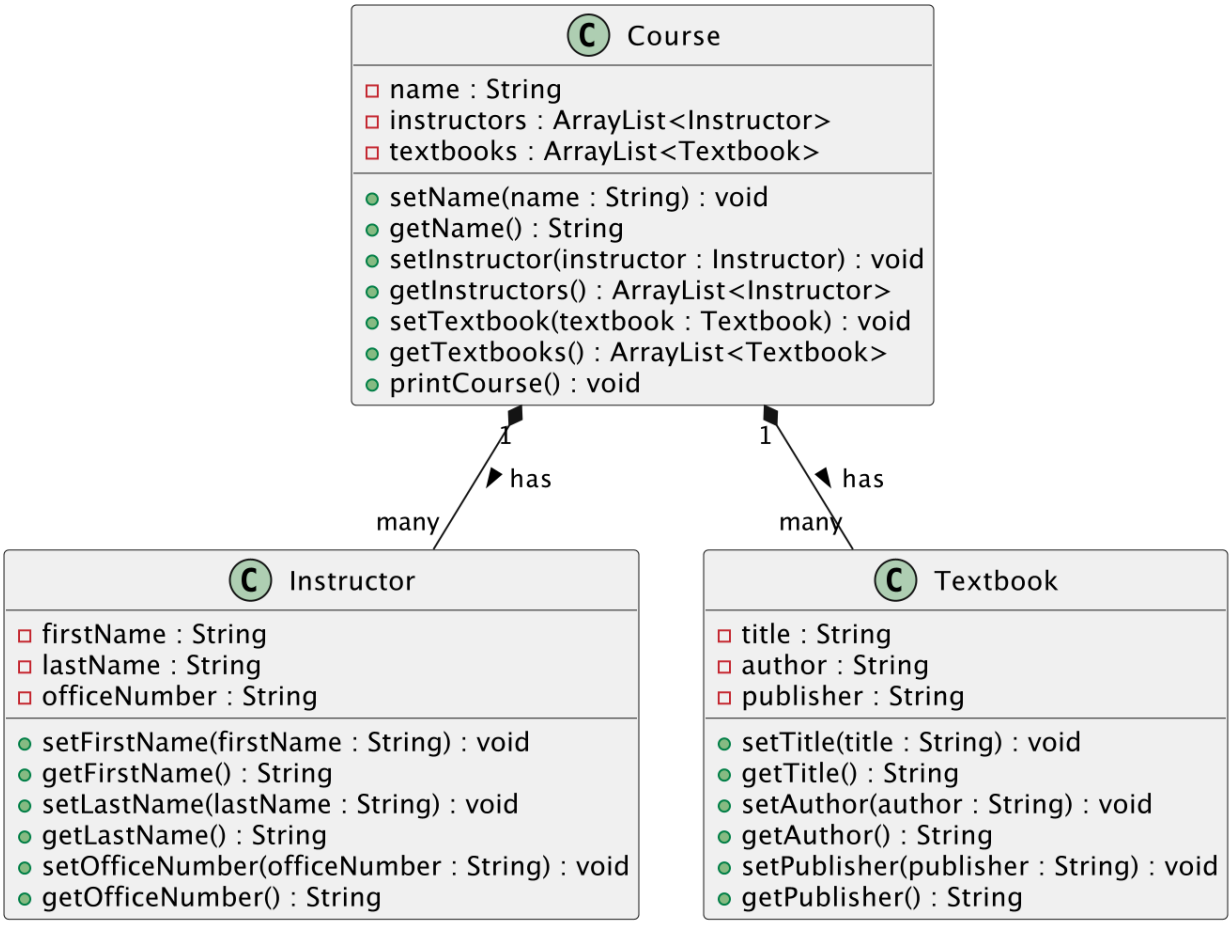

Ship
◇ shipName : String
◇ yearBuilt : String
● Ship(shipName : String, yearBuilt : String)
● setShipName(shipName : String) : void
● getShipName() : String
● setYearBuilt(yearBuilt : String) : void
● getYearBuilt() : String
● printShip() : void
CruiseShip
□ maxNumberPassengers : int
● CruiseShip(shipName : String, yearBuilt : String, maxNumberPassengers : int)
● setMaxNumberPassengers(maxNumberPassengers : int) : void
● getMaxNumberPassengers() : int
● printShip() : void
CargoShip
□ cargoCapacityInTonnage : int
● CargoShip(shipName : String, yearBuilt : String, cargoCapacityInTonnage : int)
● setCargoCapacityInTonnage(cargoCapacityInTonnage : int) : void
● getCargoCapacityInTonnage() : int
● printShip() : void

Part 3

Code

```
@startuml

' Definition of the Instructor class
class Instructor {
    -firstName : String
    -lastName : String
    -officeNumber : String

    +setFirstName(firstName : String) : void
    +getFirstName() : String
    +setLastName(lastName : String) : void
    +getLastName() : String
    +setOfficeNumber(officeNumber : String) : void
    +getOfficeNumber() : String
}

' Definition of the Textbook class
class Textbook {
    -title : String
    -author : String
    -publisher : String

    +setTitle(title : String) : void
    +getTitle() : String
    +setAuthor(author : String) : void
    +getAuthor() : String
    +setPublisher(publisher : String) : void
    +getPublisher() : String
}

' Definition of the Course class, which aggregates Instructor and Textbook
class Course {
    -name : String
    -instructors : ArrayList<Instructor>
    -textbooks : ArrayList<Textbook>

    +setName(name : String) : void
    +getName() : String
    +setInstructor(instructor : Instructor) : void
    +getInstructors() : ArrayList<Instructor>
    +setTextbook(textbook : Textbook) : void
    +getTextbooks() : ArrayList<Textbook>
    +printCourse() : void
}

Course "1" *-- "many" Instructor : has >
Course "1" *-- "many" Textbook : has >

@enduml
```

Output

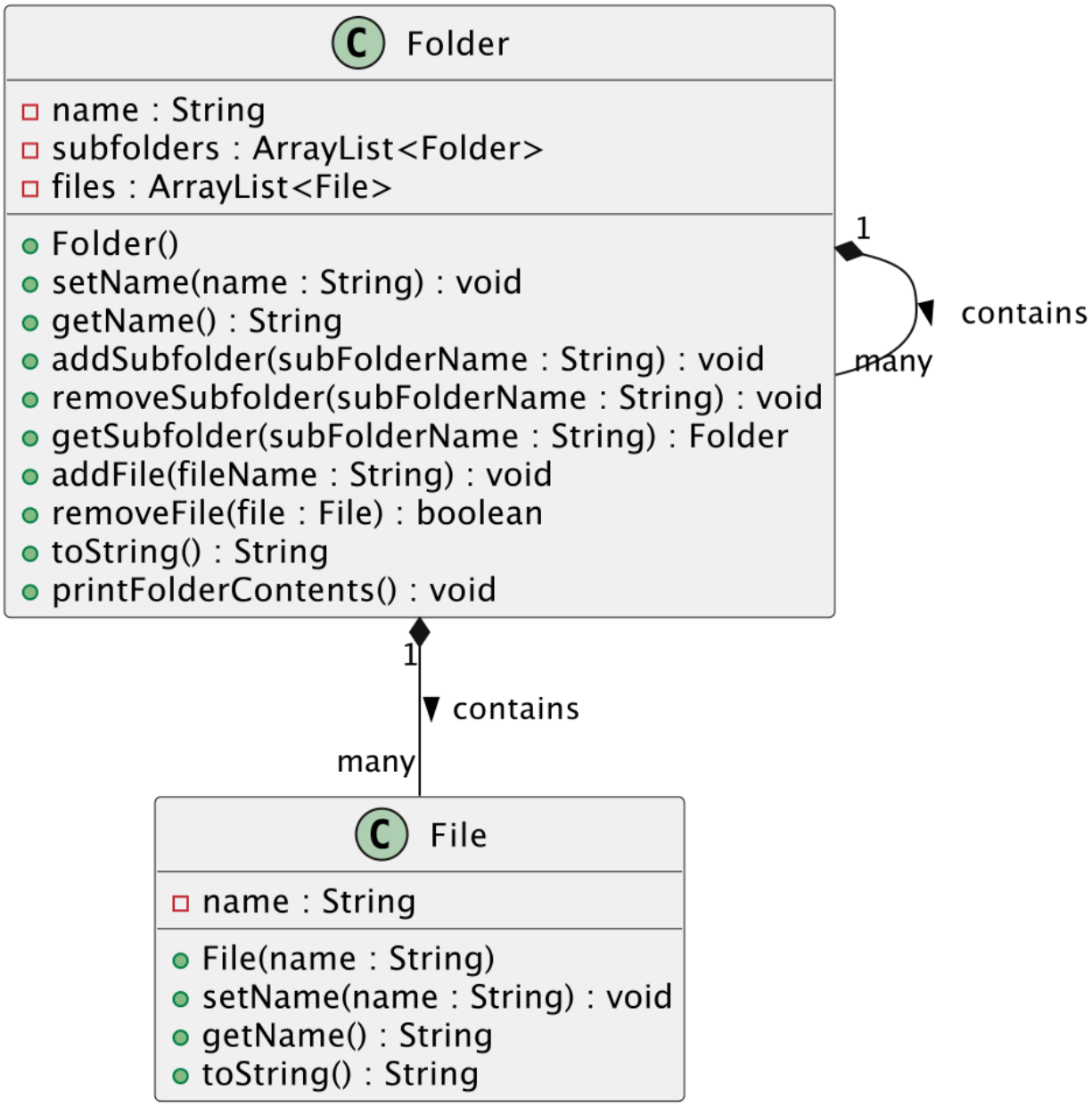

Course
name : String
instructors : ArrayList<Instructor>
textbooks : ArrayList<Textbook>
setName(name : String) : void
getName() : String
setInstructor(instructor : Instructor) : void
getInstructors() : ArrayList<Instructor>
setTextbook(textbook : Textbook) : void
getTextbooks() : ArrayList<Textbook>
printCourse() : void
1
has
many
1
has
many
Instructor
firstName : String
lastName : String
officeNumber : String
setFirstName(firstName : String) : void
getFirstName() : String
setLastName(lastName : String) : void
getLastName() : String
setOfficeNumber(officeNumber : String) : void
getOfficeNumber() : String
Textbook
title : String
author : String
publisher : String
setTitle(title : String) : void
getTitle() : String
setAuthor(author : String) : void
getAuthor() : String
setPublisher(publisher : String) : void
getPublisher() : String

Part 4

Code

```
@startuml

' Definition of the File class
class File {
    -name : String

    +File(name : String)
    +setName(name : String) : void
    +getName() : String
    +toString() : String
}

' Definition of the Folder class, which owns File objects and other Folder
objects
class Folder {
    -name : String
    -subfolders : ArrayList<Folder>
    -files : ArrayList<File>

    +Folder()
    +setName(name : String) : void
    +getName() : String
    +addSubfolder(subFolderName : String) : void
    +removeSubfolder(subFolderName : String) : void
    +getSubfolder(subFolderName : String) : Folder
    +addFile(fileName : String) : void
    +removeFile(file : File) : boolean
    +toString() : String
    +printFolderContents() : void
}

Folder "1" *-- "many" Folder : contains >
Folder "1" *-- "many" File : contains >

@enduml
```

Output


Folder
name : String
subfolders : ArrayList<Folder>
files : ArrayList<File>
Folder()
setName(name : String) : void
getName() : String
addSubfolder(subFolderName : String) : void
removeSubfolder(subFolderName : String) : void
getSubfolder(subFolderName : String) : Folder
addFile(fileName : String) : void
removeFile(file : File) : boolean
toString() : String
printFolderContents() : void
1
contains
many
1
contains
many
File
name : String
File(name : String)
setName(name : String) : void
getName() : String
toString() : String

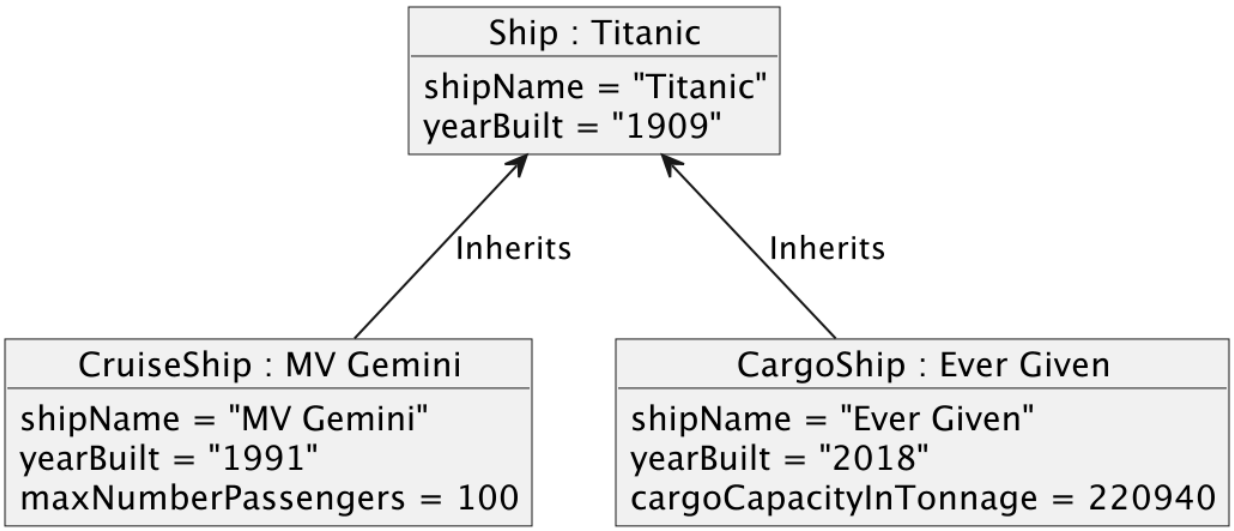
Object Diagrams

Part 2

Code

```
@startuml

object "Ship : Titanic" as Ship1 {
  shipName = "Titanic"
  yearBuilt = "1909"
}

object "CruiseShip : MV Gemini" as CruiseShip1 {
  shipName = "MV Gemini"
  yearBuilt = "1991"
  maxNumberPassengers = 100
}

object "CargoShip : Ever Given" as CargoShip1 {
  shipName = "Ever Given"
  yearBuilt = "2018"
  cargoCapacityInTonnage = 220940
}

Ship1 <-- CruiseShip1 : Inherits
Ship1 <-- CargoShip1 : Inherits

@enduml
```

Output

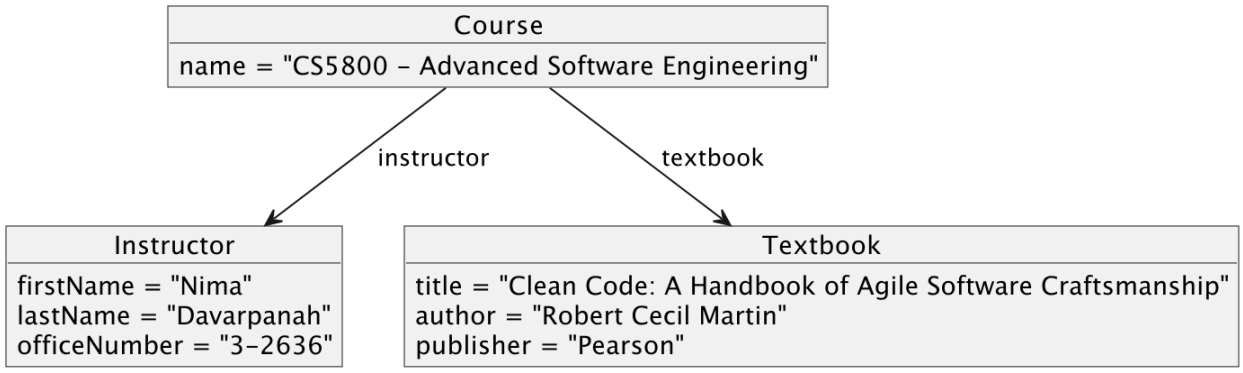


Part 3

Code

```
@startuml

object Instructor {
  firstName = "Nima"
  lastName = "Davarpanah"
  officeNumber = "3-2636"
}

object Textbook {
  title = "Clean Code: A Handbook of Agile Software Craftsmanship"
  author = "Robert Cecil Martin"
  publisher = "Pearson"
}

object Course {
  name = "CS5800 - Advanced Software Engineering"
}

Course --> Instructor : instructor
Course --> Textbook : textbook

@enduml
```

Output



Part 4

Code

```
@startuml

' Define instances of Folder and File after the 'app' folder deletion

object Folder {
  name = "php_demo1"
}

object SubFolder1 {
  name = "Source Files"
}

object SubFolder1_1 {
  name = ".phalcon"
}

object SubFolder1_3 {
  name = "cache"
}

object SubFolder1_4 {
  name = "public"
}

object File1_4_1 {
  name = ".htaccess"
}

object File1_4_2 {
  name = ".htrouter.php"
}

object File1_4_3 {
  name = "index.html"
}

object SubFolder2 {
  name = "Include Path"
}

object SubFolder3 {
  name = "Remote Files"
}

' Define the links representing the composition relationships
Folder -right-> SubFolder1 : subfolders
SubFolder1 -down-> SubFolder1_1 : subfolders
SubFolder1 -down-> SubFolder1_3 : subfolders
SubFolder1 -down-> SubFolder1_4 : subfolders
SubFolder1_4 -right-> File1_4_1 : files
SubFolder1_4 -right-> File1_4_2 : files
SubFolder1_4 -right-> File1_4_3 : files
Folder -right-> SubFolder2 : subfolders
Folder -right-> SubFolder3 : subfolders
```

```
@enduml
```

Output