XI'AN JIAOTONG-LIVERPOOL UNIVERSITY

西 交 利 物 浦 大 学

YEAR 2

COURSE WORK SUBMISSION

Name	*Sun*	Zheng
ID Number	*1507820*	
Programme	*Computer Science and Technology*	
Module Title	Introduction to Programming in Java	
Module Code	*CSE105*	
Assignment Title	CW3: Java programming project	
Submission Deadline	*11th December 2016, 6pm*	
Lecturer Responsible	*Chris Trathen*	

I certify that:

- I have read and understood the University's definitions of COLLUSION and PLAGIARISM (available in the Student Handbook of Xi'an Jiaotong-Liverpool University).

With reference to these definitions, I certify that:

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Signature ……Zheng Sun…… Date ……*12/10/2016*……

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a. System design:

Control class:
Class: CSE105
Attributes:
Input: Scanner(System.in)
openFileFlag: boolean
Methods:

```
main(String[] args): void
    listOfDeals: ArrayList<Car>
    SET listOfDeals TO readCarsInfoToArrayList()
    DO controlPannel(listOfDeals)
    DO deleteAndRefactorObjectFile(listOfDeals,"CarInfo.text")
controlPannel(ArrayList<Car> x): void
    INITIALIZE exit TO FALSE
    DO
        PRINT choices
        DO select = input.nextLine()
        IF select = “0”
            SET exit TO TRUE
        ENDIF
        IF select = “1”
            SET listForSale TO selectCarForSale(x)
            PRINT current number of cars in garage
            IF listForSale.size() is LESS THAN 20
                DO x.add(dataEntryNewCar())
                DO sortByPurchaseDate(x)
            ELSE
                PRINT ERROR
        ENDIF
        IF select = “2”
            SET listForSale TO selectCarForSale(x)
            DO printCarList(listForSale)
            IF listForSale.size() is POSITIVE
                DO sellCarWithID(x)
            ELSE
                PRINT error
        ENDIF
        IF select = “3”
            SET listForSale TO selectCarForSale(x)
            SET listOfSales TO selectCarSold(x)
             DO printCarList(listForSale)
             DO printCarSalesReport(listOfSales)
             DO changeCarInfoWithID(x)
        ENDIF
        IF select = “4”
            SET listForSale TO selectCarForSale(x)
            PRINT current car number
```

```
                DO printCarList(listForSale);
            ENDIF
            IF select = “5”
                SET listOfSales TO selectCarSold(x)
                DO printCarSalesReport(listOfSales)
            ENDIF
            IF select = DEFAULT
                PRINT ERROR
            ENDIF
        WHILE eixt =! true
readCarsInfoToArrayList(): ArrayList<Car>
        OPEN(CREATE) "CarInfo.text"
        TRY
            IF nextLine != null
                READ lines
                UNFLATTEN line TO s[]
                PARSE info From s[]
            ENDIF
            CLOSE "CarInfo.text"
        CATCH PRINT error

selectCarSold(ArrayList<Car> x): ArrayList<Car>
        FOR each Car Object fec in x
            IF fec.isSold()
                DO listOfSales.add(fec)
        ENDFOR
        DO sortByPurchaseDate(listOfSales)
        return listOfSales

selectCarForSale(ArrayList<Car> x): ArrayList<Car>
        FOR each Car Object fec in x
            IF !fec.isSold()
                DO listForSales.add(fec)
        ENDFOR
        DO sortByPurchaseDate(listForSales)
        return listForSales

sortByPurchaseDate(ArrayList<Car> x): ArrayList<Car>
        DO BUBBLESORT TO x
        RETURN x
dataEntryNewCar(): Car
        SET dop TO inputDate()
        SET pp TO inputDouble()
        SET ds TO input.nextLine()
        SET c TO new Car(dop, pp, ds)
        RETURN c
sellCarWithID(ArrayList<Car> x): void
        SET y TO inputInteger()
```

```
        FOR each Car Object fec in x
            IF fec.getCarID() == y && !fec.isSold()
                ALTER sale info
            ELSE
                PRINT error
            ENDIF
        ENDFOR
    changeCarInfoWithID(ArrayList<Car> x): void
        SET y TO inputInteger()
        FOR each Car Object fec in x
            IF fec.getCarID() == y && fec.isSold()
            ALTER purchase info and sales Info
            ELSE IF fec.getCarID() == y && !fec.isSold()
                ALTER purchase info
                ELSE
                PRINT error
                ENDIF
            ENDIF
        ENDFOR
    printCarList(ArrayList<Car> x): void
        DO sortByPurchaseDate(x)
        FOR each Car Object fec in x
            DO fec.printListFormat()
            ADD fec.getPurchasePrice() TO currentPurchaseExpenditure
        ENDFOR
        PRINT currentPurchaseExpenditure

    printCarSalesReport(ArrayList<Car> x): void
        DO sortByPurchaseDate(x)
        FOR each Car Object fec in x
            DO fec.printReportFormat()
            ADD fec.getProfitOfSale() TO totalProfit
        ENDFOR
        PRINT totalProfit
    deleteAndRefactorObjectFile(ArrayList<Car> x, String y): void
        IF openFileFlag
            TRY DELETE "CarInfo.text"
            CATCH PRINT error
        ENDIF
        TRY WRITE info TO "CarInfo.text"
        CATCH PRINT error
    inputDate(): Date
        INITIALIZE date TO current time
        INITIALIZE dataValidationFlag TO FALSE
        DO
            READ s
            TRY PARSE s TO Date date
                SET dataValidationFlag TO TRUE
```

CATCH PRINT error
REPEAT UNTIL dataValidationFlag is TRUE
RETURN dNum

inputDouble(): double
INITIALIZE dNum TO 0
INITIALIZE dataValidationFlag TO FALSE
DO
READ s
TRY PARSE s TO double dNum
SET dataValidationFlag TO TRUE
CATCH PRINT error
REPEAT UNTIL dataValidationFlag is TRUE
RETURN dNum

inputInteger(): int
INITIALIZE dNum TO 0
INITIALIZE dataValidationFlag TO FALSE
DO
READ s
TRY PARSE s TO integer dNum
SET dataValidationFlag TO TRUE
CATCH PRINT error
REPEAT UNTIL dataValidationFlag is TRUE
RETURN dNum

Object class:
Class: Car
Attributes:
lastID: int
numOfCarInGarage: int
dateOfPurchase: Date
dateOfSale: Date
purchasePrice: double
salePrice: double
profitOfSale: double
carID: int
isSold: Boolean
description: String
INITIALIZE lastID TO 0
INITIALIZE numOfCarInGarage TO 0
INITIALIZE dateOfSale TO current time
INITIALIZE salePrice TO 0
INITIALIZE isSold TO false
INITIALIZE description TO “”
Methods:
+ Car(Date d, double pP, String ds)
SET the purchase price of the current car object TO d

SET the date of purchase of the current car object TO pP
SET the description of the current car object TO ds
INCEMENTAL number of cars in garage
INCEMENTAL last ID of the cars
SET the ID of the current car TO last ID of the cars
SET the sales profit of the current car object TO the DIFFERENCE of the sales price and the purchase price of the current car object
+ Car(Date dop, double pP, Date dos, double sP, boolean iS, String ds)
SET the purchase price of the current car object TO dop
SET the date of purchase of the current car object TO pP
SET the sale price of the current car object TO dos
SET the date of sale of the current car object TO sP
SET the description of the current car object TO ds
INCEMENTAL last ID of the cars
SET the ID of the current car TO last ID of the cars
SET the sales status of the current car object TO iS
SET the sales profit of the current car object TO the DIFFERENCE of the sales price and the purchase price of the current car object
IF iS is False
THEN INCEMENTAL number of cars in garage
+ getDateOfPurchase(): Date
RETURN the date of purchase of the current car object
+setDateOfPurchase(Date x): void
SET the date of purchase of the current car object TO x
+getPurchasePrice() : double
RETURN the purchase price of the current car object
+setPurchasePrice(double x): void
SET the purchase price of the current car object TO x
SET the sales profit of the current car object TO the Difference of the sales price and the purchase price of the current car object
+getCarID(): int
RETURN the purchase price of the current car object
+setCarID(int x): void
SET the ID of the current car object TO x
+getDateOfSale(): Date
RETURN the date of purchase of the current car object
+setDateOfSale(Date x): void
SET the date of sale of the current car object TO x
+getSalePrice(): double
SET the date of sale of the current car object TO x
+setSalePrice(double x): void
SET the sale price of the current car object TO x
SET the sales profit of the current car object TO the DIFFERENCE of the sales price and the purchase price of the current car object
+getProfitOfSale(): double
RETURN the sales profit of the current car object
+isSold(): Boolean
RETURN the sales status of the current car object

+setSold(boolean x): void
SET the sales status of the current car object TO x
DECREMENTAL the number of cars in the garage
+getDescrption: String
RETURN the description of the current car object
+setDescrption(String x): void
SET the description of the current car object TO x
+toText(): String
FLATTEN the ID, date of purchase, purchase price, date of sale, sale price, sale status, description
+printReportFormat(): void
PRINT the ID, date of purchase, purchase price, date of sale, sale price, profit of sale, description IN SALES REPORT FORMAT
+printListFormat(): void
PRINT the ID, date of purchase, purchase price, description IN INVENTORY LIST FORMAT

b. Testing:

Test case 1:

Pre-condition:

No cars purchased already.
No cars sold yet.
Sell one car.

Input (Key board):

None.

Expected result:

Request rejected.

Actual result:

Loading history account.....
Loading failed
0 = exit, 1 = purchaseCar, 2=sellCar, 3=changeCarInfo, 4=InventoryList, 5= salesReport
2
Here are the cars for sale:
carID dateOfPurchase purchasePrice Description
Current spending on unsold cars:0.0
Sorry, the garage is empty, please purchase some car to sell.
0 = exit, 1 = purchaseCar, 2=sellCar, 3=changeCarInfo, 4=InventoryList, 5= salesReport

Test case 2:

Pre-condition:

19 cars purchased already.
No cars sold yet.
Purchase one car.

Input (Key board):

Purchase date
Purchase price
Description of the car

Expected result:

Car is added to the inventory list.
Verify by displaying inventory list.

Actual result:

0 = exit, 1 = purchaseCar, 2=sellCar, 3=changeCarInfo, 4=InventoryList, 5= salesReport
1
The garage can accomodate 20 cars in total. There are currently 19 cars in garage.
Enter the details of the car:
Enter date of purchase(d/M/y):
16/09/12
Enter purchase price:
124.95
Enter the description:
Tesco Lamborghini Aventador 6v motorised car
0 = exit, 1 = purchaseCar, 2=sellCar, 3=changeCarInfo, 4=InventoryList, 5= salesReport
4
The garage can accomodate 20 cars in total. There are currently 20 cars in garage.
Here are the cars for sale:

carID	dateOfPurchase	purchasePrice	Description
1	2001/1/1	16680.00	LEAF from Johnathan Culbert
2	2002/2/2	12995.00	PULSAR from Chris Trathen
3	2003/3/3	14320.00	JUKE from cousin Joe
4	2003/3/3	18545.00	QASHQAI
5	2004/4/4	22395.00	X-TAIL FROM Chris
6	2004/4/21	213011.00	Audi S6
7	2005/5/5	23520.00	NAVARA form Trathen family
8	2006/6/6	25217.00	Toyota Cramy 2014
9	2007/7/7	5849859.00	benz
10	2009/5/3	1234567.00	Rubbish car
11	2011/11/11	998.00	toy car
12	2011/11/11	969550.00	Example for change information
13	2011/11/11	45676.00	HHA
14	2011/11/12	645.00	model car
15	2011/12/13	99849.00	none
16	2011/12/13	99999.00	test
17	2012/9/16	124.95	Tesco Lamborghini Aventador 6v motorised car
18	2012/11/12	12221.00	from Yolanda
19	2012/12/12	584549.00	useless car
20	2012/12/12	456756.00	Luxury car

Current spending on unsold cars:9701476.95

Test case 3:

Pre-condition:

20 cars purchased already.
No cars sold yet.
Purchase one car.

Input (Key board):

None

Expected result:

Request rejected.

Actual result:

0 = exit, 1 = purchaseCar, 2=sellCar, 3=changeCarInfo, 4=InventoryList, 5= salesReport
1
The garage can accomodate 20 cars in total. There are currently 20 cars in garage.
Sorry, the garage can only accomodate 20 cars, please sell some car to purchase.

Test case 4:

Pre-condition:

20 cars purchased already.
5 cars sold.
Sell one car.

Input (Key board):

Date of sale
Sale price
description

Expected result:

Car is removed from the inventory list and added to sales report
Verify by displaying inventory list and sales report.

Actual result:

0 = exit, 1 = purchaseCar, 2=sellCar, 3=changeCarInfo, 4=InventoryList, 5= salesReport
2
Here are the cars for sale:

carID	dateOfPurchase	purchasePrice	Description
1	2001/1/1	16680.00	LEAF from Johnathan Culbert
2	2002/2/2	12995.00	PULSAR from Chris Trathen
3	2003/3/3	14320.00	JUKE from cousin Joe
4	2003/3/3	18545.00	QASHQAI
5	2004/4/4	22395.00	X-TAIL FROM Chris
6	2004/4/21	213011.00	Audi S6
7	2005/5/5	23520.00	NAVARA form Trathen family
8	2006/6/6	25217.00	Toyota Cramy 2014
9	2007/7/7	5849859.00	benz
10	2009/5/3	1234567.00	Rubbish car
12	2011/11/11	969550.00	Example for change information
13	2011/11/11	45676.00	HHA
14	2011/11/12	645.00	model car
15	2011/12/13	99849.00	none
16	2011/12/13	99999.00	test
18	2012/11/12	12221.00	from Yolanda

Current spending on unsold cars:8659049.0
Please Enter the ID for sale:
18
Please Enter the Date of Sale(d/M/y):
11/09/16
Please Enter the Sale Price:
20000
Enter the description:
by LEE

0 = exit, 1 = purchaseCar, 2=sellCar, 3=changeCarInfo, 4=InventoryList, 5= salesReport
4
The garage can accomodate 20 cars in total. There are currently 15 cars in garage.
Here are the cars for sale:

carID	dateOfPurchase	purchasePrice	Description
1	2001/1/1	16680.00	LEAF from Johnathan Culbert
2	2002/2/2	12995.00	PULSAR from Chris Trathen
3	2003/3/3	14320.00	JUKE from cousin Joe
4	2003/3/3	18545.00	QASHQAI
5	2004/4/4	22395.00	X-TAIL FROM Chris
6	2004/4/21	213011.00	Audi S6
7	2005/5/5	23520.00	NAVARA form Trathen family
8	2006/6/6	25217.00	Toyota Cramy 2014
9	2007/7/7	5849859.00	benz
10	2009/5/3	1234567.00	Rubbish car
12	2011/11/11	969550.00	Example for change information
13	2011/11/11	45676.00	HHA
14	2011/11/12	645.00	model car
15	2011/12/13	99849.00	none
16	2011/12/13	99999.00	test

Current spending on unsold cars:8646828.0
0 = exit, 1 = purchaseCar, 2=sellCar, 3=changeCarInfo, 4=InventoryList, 5= salesReport
5
All car sales:

carID	dateOfPurchase	purchasePrice	dateOfSale	salePrice	profitOfSale	Description
11	2011/11/11	998.00	2016/12/10	9000000.00	8999002.00	Sold to Trump
17	2012/9/16	124.95	2016/9/16	7800.00	7675.05	Tesco Lamborghini Aventador 6v motorised car sold to neighbour's child
18	2012/11/12	12221.00	2016/9/11	20000.00	7779.00	by LEE
19	2012/12/12	584549.00	2016/12/9	700000.00	115451.00	Sold to Trump
20	2012/12/12	456756.00	2017/12/10	500000.00	43244.00	Sell to xjtlu

Total profit: 9173151.05
0 = exit, 1 = purchaseCar, 2=sellCar, 3=changeCarInfo, 4=InventoryList, 5= salesReport

Test case 5:

Pre-condition:

20 cars purchased already.
5 cars sold.
Change the info of a sold car

Input (Key board):

Date of purchase
Purchase price
Date of sale
Sale price
description

Expected result:
Car sales information is changed
Verify by displaying sales report.
Actual result:
0 = exit, 1 = purchaseCar, 2=sellCar, 3=changeCarInfo, 4=InventoryList, 5= salesReport
3
Here are the cars for sale:

carID	dateOfPurchase	purchasePrice	Description
1	2001/1/1	16680.00	LEAF from Johnathan Culbert
2	2002/2/2	12995.00	PULSAR from Chris Trathen
3	2003/3/3	14320.00	JUKE from cousin Joe
4	2003/3/3	18545.00	QASHQAI
5	2004/4/4	22395.00	X-TAIL FROM Chris
6	2004/4/21	213011.00	Audi S6
7	2005/5/5	23520.00	NAVARA form Trathen family
8	2006/6/6	25217.00	Toyota Cramy 2014
9	2007/7/7	5849859.00	benz
10	2009/5/3	1234567.00	Rubbish car
12	2011/11/11	969550.00	Example for change information
13	2011/11/11	45676.00	HHA
14	2011/11/12	645.00	model car
15	2011/12/13	99849.00	none
16	2011/12/13	99999.00	test

Current spending on unsold cars:8646828.0
All car sales:

carID	dateOfPurchase	purchasePrice	dateOfSale	salePrice	profitOfSale	Description
11	2011/11/11	998.00	2016/12/10	9000000.00	8999002.00	Sold to Trump
17	2012/9/16	124.95	2016/9/16	7800.00	7675.05	Tesco Lamborghini Aventador 6v motorised car sold to neighbour's child
18	2012/11/12	12221.00	2016/9/11	20000.00	7779.00	by LEE
19	2012/12/12	584549.00	2016/12/9	700000.00	115451.00	Sold to Trump
20	2012/12/12	456756.00	2017/12/10	500000.00	43244.00	Sell to xjtlu

Total profit: 9173151.05
Please Enter the ID from the list to change:
11
Please Enter the Date of Purchase(d/M/y):
11/11/11
Please Enter the Purchase Price:
9980
Please Enter the Date of Sale(d/M/y):
10/12/16
Please Enter the Sale Price:
13000
Enter the description:

Sold to Trump's attorny
0 = exit, 1 = purchaseCar, 2=sellCar, 3=changeCarInfo, 4=InventoryList, 5= salesReport
5
All car sales:

carID	dateOfPurchase	purchasePrice	dateOfSale	salePrice	profitOfSale	Description
11	2011/11/11	9980.00	2016/12/10	13000.00	3020.00	Sold to Trump's attorny
17	2012/9/16	124.95	2016/9/16	7800.00	7675.05	Tesco Lamborghini Aventador 6v motorised car sold to neighbour's child
18	2012/11/12	12221.00	2016/9/11	20000.00	7779.00	by LEE
19	2012/12/12	584549.00	2016/12/9	700000.00	115451.00	Sold to Trump
20	2012/12/12	456756.00	2017/12/10	500000.00	43244.00	Sell to xjtlu

Total profit: 177169.05

Test case 6:

Pre-condition:

20 cars purchased already.
5 cars sold.
Change the info of an unsold car.

Input (Key board):

Date of purchase
Purchase price
description

Expected result:

Car sales information is changed
Verify by displaying inventory list

Actual result:

0 = exit, 1 = purchaseCar, 2=sellCar, 3=changeCarInfo, 4=InventoryList, 5= salesReport
3
Here are the cars for sale:

carID	dateOfPurchase	purchasePrice	Description
1	2001/1/1	16680.00	LEAF from Johnathan Culbert
2	2002/2/2	12995.00	PULSAR from Chris Trathen
3	2003/3/3	14320.00	JUKE from cousin Joe
4	2003/3/3	18545.00	QASHQAI
5	2004/4/4	22395.00	X-TAIL FROM Chris
6	2004/4/21	213011.00	Audi S6
7	2005/5/5	23520.00	NAVARA form Trathen family
8	2006/6/6	25217.00	Toyota Cramy 2014
9	2007/7/7	5849859.00	benz
10	2009/5/3	1234567.00	Rubbish car
12	2011/11/11	969550.00	Example for change information
13	2011/11/11	45676.00	HHA
14	2011/11/12	645.00	model car
15	2011/12/13	99849.00	none
16	2011/12/13	99999.00	test

Current spending on unsold cars:8646828.0
All car sales:

carID	dateOfPurchase	purchasePrice	dateOfSale	salePrice	profitOfSale	Description
11	2011/11/11	9980.00	2016/12/10	13000.00	3020.00	Sold to Trump's attorny
17	2012/9/16	124.95	2016/9/16	7800.00	7675.05	Tesco Lamborghini Aventador 6v motorised car sold to neighbour's child
18	2012/11/12	12221.00	2016/9/11	20000.00	7779.00	by LEE
19	2012/12/12	584549.00	2016/12/9	700000.00	115451.00	Sold to Trump
20	2012/12/12	456756.00	2017/12/10	500000.00	43244.00	Sell to xjtlu

Total profit: 177169.05
Please Enter the ID from the list to change:
10
Please Enter the Date of Purchase(d/M/y):
09/09/90
Please Enter the Purchase Price:
3000
Enter the description:
null
0 = exit, 1 = purchaseCar, 2=sellCar, 3=changeCarInfo, 4=InventoryList, 5= salesReport
4
The garage can accomodate 20 cars in total. There are currently 15 cars in garage.
Here are the cars for sale:

carID	dateOfPurchase	purchasePrice	Description
1	1990/9/9	3000.00	null
2	2001/1/1	16680.00	LEAF from Johnathan Culbert
3	2002/2/2	12995.00	PULSAR from Chris Trathen
4	2003/3/3	14320.00	JUKE from cousin Joe
5	2003/3/3	18545.00	QASHQAI
6	2004/4/4	22395.00	X-TAIL FROM Chris
7	2004/4/21	213011.00	Audi S6
8	2005/5/5	23520.00	NAVARA form Trathen family
9	2006/6/6	25217.00	Toyota Cramy 2014
10	2007/7/7	5849859.00	benz
12	2011/11/11	969550.00	Example for change information
13	2011/11/11	45676.00	HHA
14	2011/11/12	645.00	model car
15	2011/12/13	99849.00	none
16	2011/12/13	99999.00	test

Current spending on unsold cars:7415261.0