



An-Najah National University

Faculty of Engineering

Department of Computer Engineering

Database Course

Auto Trading Company Project Report

Moath Abu Sada

7 / 12 / 2016

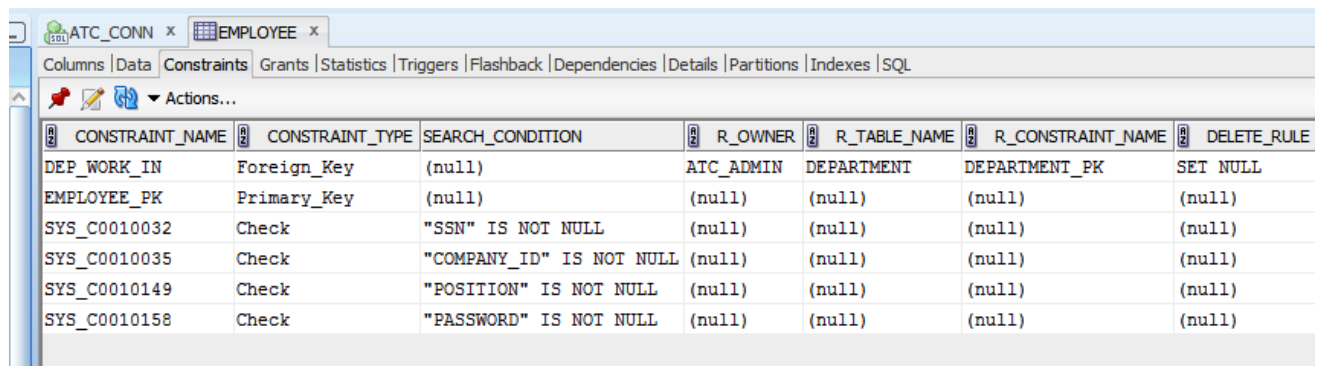
The first step is to find the idea of project so that supports the needs of a wide layer of companies in the market, also provides many options shorten the time and effort on the company, employees and customers.

Second step is writing the requirements of project which contains a detailed description of the main components of the company and what information should be stored for each component and also define the relationships between them.

Then we designed UML diagram for database which is the simplest way to communicate between team members.

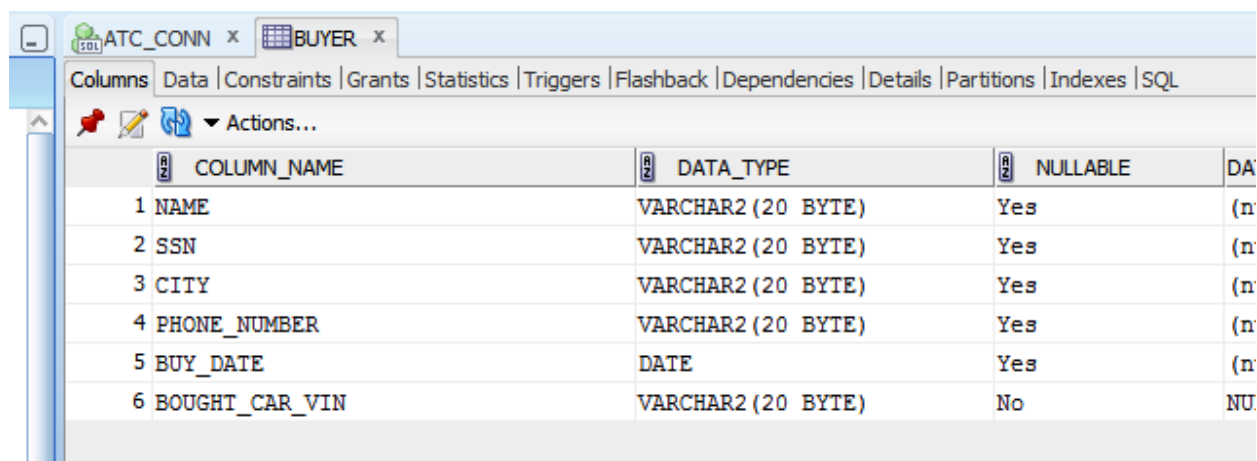
Third step is creating a schema of database then create tables and determining the primary key, foreign key of each table as well as what attribute should not be null or should be unique, this all depends on the UML diagram we designed.

The two pictures below are taken from SQL Developer Show some table and constraints on it.



The screenshot shows the SQL Developer interface with the 'EMPLOYEE' table selected. The 'Constraints' tab is active, displaying a list of constraints for the table. The table has columns: CONSTRAINT_NAME, CONSTRAINT_TYPE, SEARCH_CONDITION, R_OWNER, R_TABLE_NAME, R_CONSTRAINT_NAME, and DELETE_RULE.

CONSTRAINT_NAME	CONSTRAINT_TYPE	SEARCH_CONDITION	R_OWNER	R_TABLE_NAME	R_CONSTRAINT_NAME	DELETE_RULE
DEP_WORK_IN	Foreign_Key	(null)	ATC_ADMIN	DEPARTMENT	DEPARTMENT_PK	SET NULL
EMPLOYEE_PK	Primary_Key	(null)	(null)	(null)	(null)	(null)
SYS_C0010032	Check	"SSN" IS NOT NULL	(null)	(null)	(null)	(null)
SYS_C0010035	Check	"COMPANY_ID" IS NOT NULL	(null)	(null)	(null)	(null)
SYS_C0010149	Check	"POSITION" IS NOT NULL	(null)	(null)	(null)	(null)
SYS_C0010158	Check	"PASSWORD" IS NOT NULL	(null)	(null)	(null)	(null)

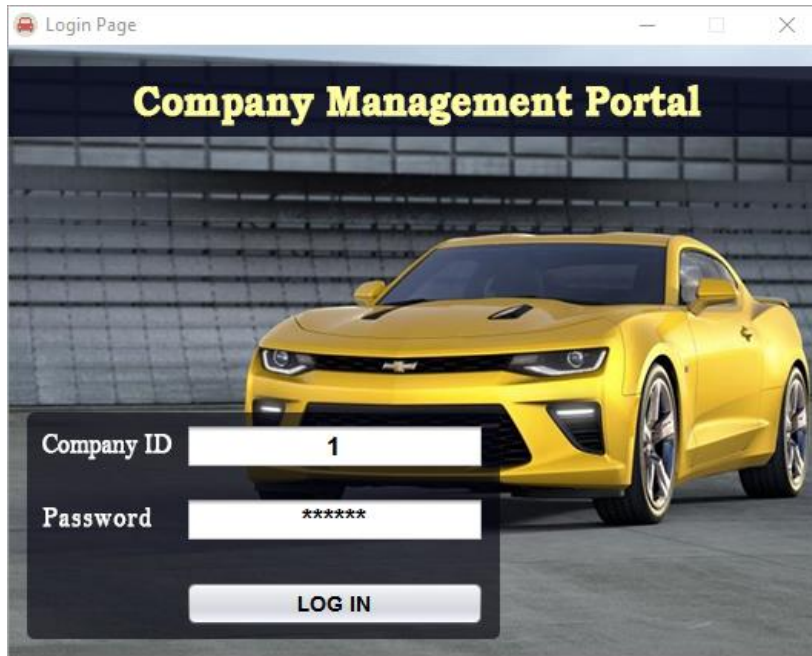


The screenshot shows the SQL Developer interface with the 'BUYER' table selected. The 'Columns' tab is active, displaying a list of columns for the table. The table has columns: COLUMN_NAME, DATA_TYPE, NULLABLE, and DATA_LENGTH.

COLUMN_NAME	DATA_TYPE	NULLABLE	DATA_LENGTH
1 NAME	VARCHAR2 (20 BYTE)	Yes	(n
2 SSN	VARCHAR2 (20 BYTE)	Yes	(n
3 CITY	VARCHAR2 (20 BYTE)	Yes	(n
4 PHONE_NUMBER	VARCHAR2 (20 BYTE)	Yes	(n
5 BUY_DATE	DATE	Yes	(n
6 BOUGHT_CAR_VIN	VARCHAR2 (20 BYTE)	No	NU

Fourth step is designing the GUI of program Which should cover all options and it is easily accessible by the user. On the other hand, it must be a high level of protection and give each user's specific permissions.

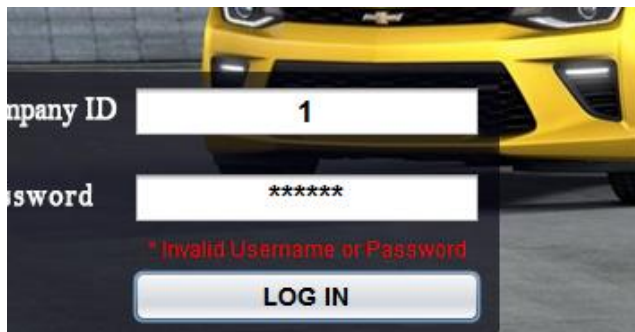
A detailed look inside the project through the pictures:



Picture above is the Log in page which each employee should enter his company ID and password to log in to control page.

Log in process:

1. program check if employee (company ID) in company DB then check if the Company ID and password is matched, if not message appears to user as in the picture below



There are different control page depends on employee position in company, for example, there are different permissions between the General administrator and sales employee.

The pictures below show different control page Depending on the employee position in company:

1. General administrator control page

Control Page - Moath AbuSada - General Administrator

Add Employee Add Department Add Car Add Engine Add Buyer Find Employee Find Department Find Car Find Engine Find Buyer

*SSN *Company ID

First Name *Password

Middle Name Employment Date

Last Name Department

Gender *Position

Birth Date Salary (USD)

Town

City

Phone Number

Email

Bank Account

Clear Add

*Full Windows bar for admin control page

Control Page - Moath AbuSada - General Administrator

Add Employee Add Department Add Car Add Engine Add Buyer Find Employee Find Department Find Car Find Engine Find Buyer

Administrator

Employee Find Department Find Car Find Engine Find Buyer Log Out

2. Sales employee control page

Has permissions less than General administrator.

Control Page - majd abusada - Sales Employee

Make
 Model
 *Vin Number
 *Engine Number
 Production Year
 Condition
 Traveled Distance(KM)
 Transmission
☐ Air Conditioning
☐ AUX ☐ USB
☐ Navigation System
☐ Central Locking
☐ Multifunction Steering Wheel
 Number of Seat
 Seat Cover
 Exterior Design
 Color
 Number of Door

☐ Electric Windows
☐ Electric side mirro
☐ Sunroof
☐ Alloy wheels
☐ Daytime running lights
☐ Fog lamp
 Other exterior features
 Sensor ☐ Front ☐ Rear ☐ Side ☐ Rain ☐ Camera
 Airbags ☐ Driver ☐ Side ☐ Front ☐ More
☐ ABS
☐ ESP
☐ Adaptive Cruise Control
☐ Collision Avoidance System
☐ Traction control
☐ Immobilizer
☐ Available Now
 Price (USD)

3. maintenance employee control page

Control Page - fatima shadid - Maintenance Employee

*Number
 Capacity(cm3)
 Power(PS)
 Fuel Type
 Fuel Consumption(KM/L)
 Additions

4. General employee control page

Control Page - razan emad - General Employee

Find Department Find Car Find Engine Log Out

Search by Department Name

Department Name Administration Search

Name

Phone number

Manager ID

Employee Count

To explain the working principle, Add, modify, or search for anything in the database, I will take the General Administrator control page as an example.

A. Add new employee

Control Page - Moath AbuSada - General Administrator

Add Employee Add Department Add Car Add Engine Add Buyer Find Employee Find Department Find Car Find Engine F

*SSN

First Name

Middle Name

Last Name

Gender Female

Birth Date 1 Jan 1950

Town

City Tulkarem

Phone Number

Email

Bank Account

*Company ID

*Password

Employment Date 1 Jan 1950

Department Administration

*Position General Adminstrator

Salary (USD)

Clear Add

When user fill the text box in data and press Add button, the first thing the program does check each field has valid data (i.e. salary just number). If there is an error, below error message appears and the process is canceled.

Phone Number

Email

Bank Account

Error

Bank Account Number Invalid

OK

then check that field SSN, Company ID, Password and position are not empty, and also SSN, company ID (primary key) must be unique. If there is an error, below error message appears and the process is canceled.

Jan 1950 Salary (USD) 56465

Message

ERROR : Duplication on Unique data or Required fields are left empty

OK

If there is no error in condition above, below information message appears.

1950 Salary (USD) 56465

Message

Employee has been successfully added

OK

Add

B. Add new department

Control Page - Moath AbuSada - General Administrator

Add Employee Add Department Add Car Add Engine Add Buyer Find Employee Find Department Find Car Find Engine Find Buyer

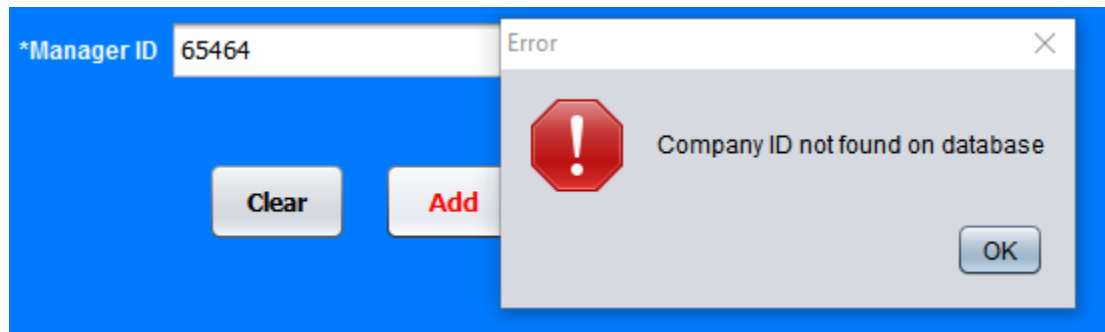
*Name

Phone number

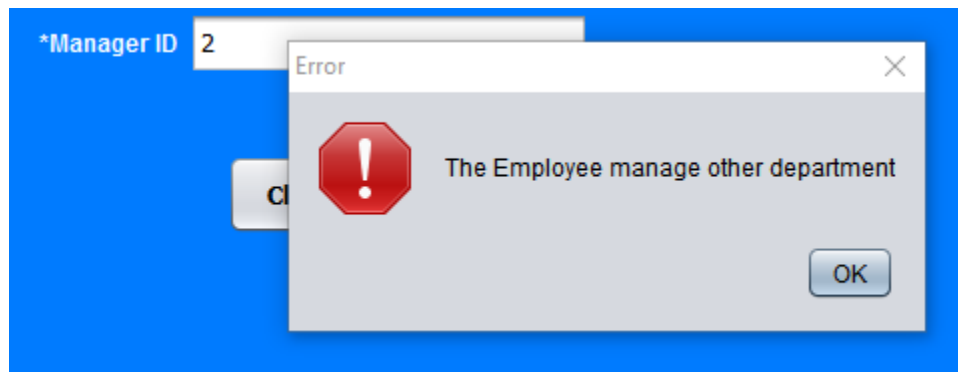
*Manager ID

Clear Add

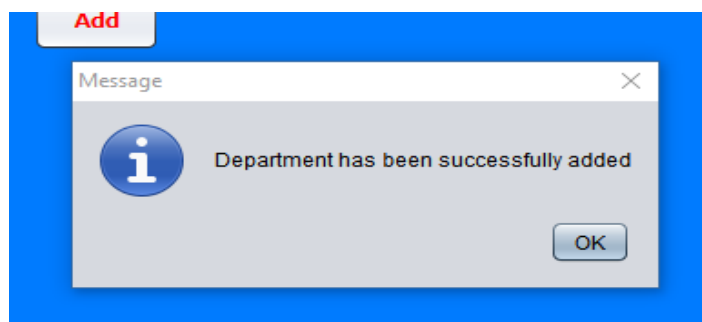
When the user fill the fields, and press Add button program check validation as in the process of Adding new employee (i.e. phone number just number) then check that name, manager id is not empty and name (primary key) is unique then check that manager ID is in database. if not found, below error message appears and the process is canceled.



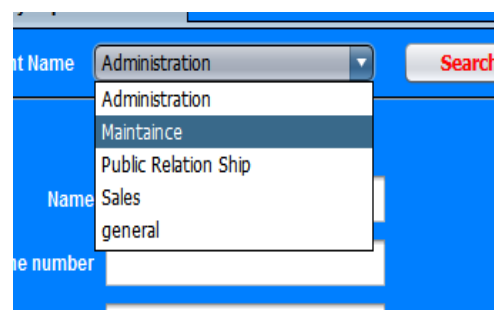
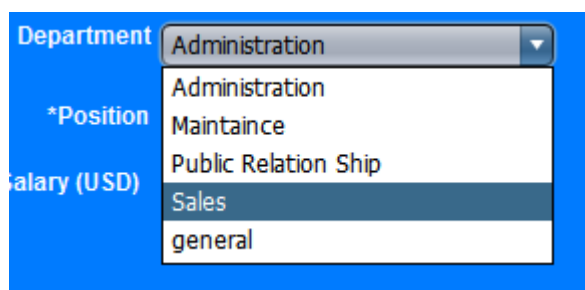
If employee (Company ID) founded, check If he actually manages another department, if yes below error message appears and the process is canceled.



if there is no error in condition above, below information message appears.



After adding department successfully refresh() method is called to refresh all department combo box in program.



C. Add Car

Control Page - Moath AbuSada - General Administrator

Buttons: Add Employee, Add Department, Add Car, Add Engine, Add Buyer, Find Employee, Find Department, Find Car, Find Engine, F

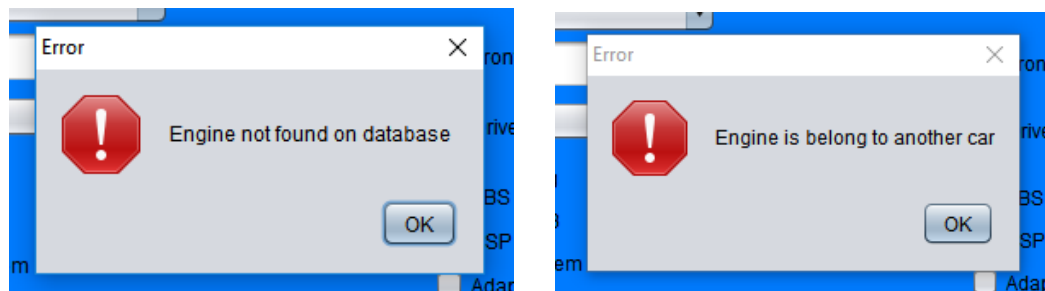
Fields and Checkboxes:

- Make:
- Model:
- *Vin Number:
- *Engine Number:
- Production Year:
- Condition:
- Traveled Distance(KM):
- Transmission:
- Other exterior features:
- Sensor: ☐ Front ☐ Rear ☐ Side ☐ Rain ☐ Camera
- Airbags: ☐ Driver ☐ Side ☐ Front ☐ More
- Available Now: ☐
- Price (USD):
- Clear Add

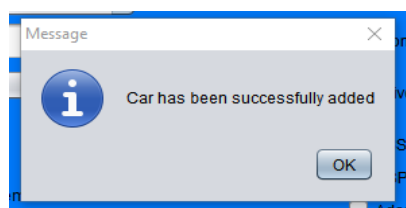
Additional features (checkboxes):

- Electric Windows
- Electric side mirror
- Sunroof
- Alloy wheels
- Daytime running lights
- Fog lamp
- Air Conditioning
- AUX ☐ USB ☐
- Navigation System
- Central Locking
- Multifunction Steering Wheel
- ABS
- ESP
- Adaptive Cruise Control
- Collision Avoidance System
- Traction control
- Immobilizer

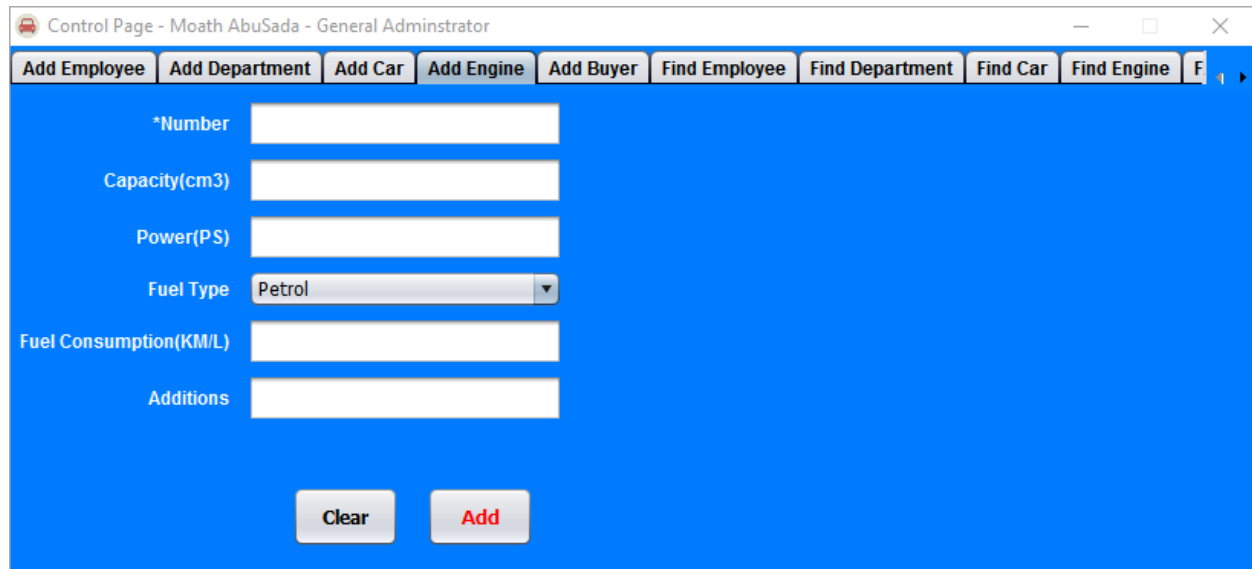
When the user fill the fields, and press Add button, program check validation of data (i.e. number of seats just numbers), then check that VIN number, Engine number not empty and unique then check that engine is in database. If engine did not find or found but belong to another car or car number already in DB, below different error messages appear and the process canceled. Relationship between car and engine one to one.



if there is no error in condition above, below information message appears.



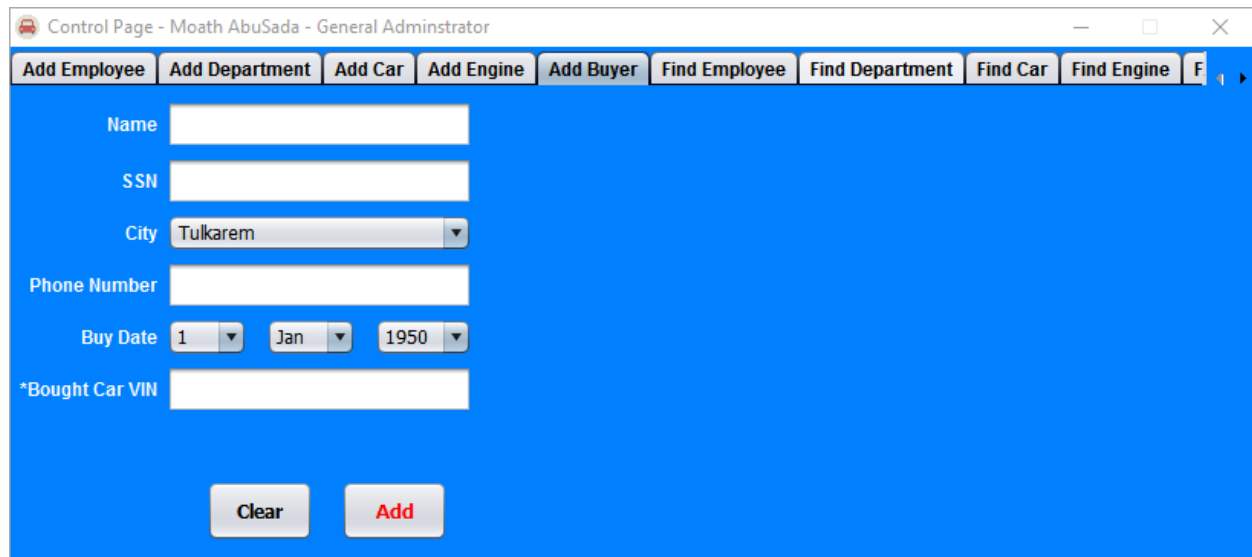
D. Add Engine



When the user fill the fields, and press Add button, program check validation of data (i.e. power just number), then check that number (primary key) not empty and unique. If engine number is already in DB, error message appears and the process canceled.

if there is no error in condition above, information message appears to indicate the successful process.

E. Adding new buyer



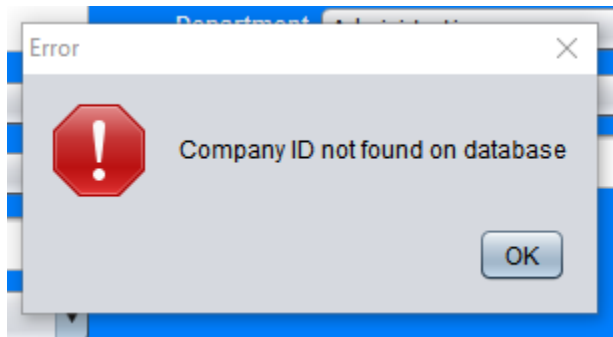
When the user fill the fields, and press add, program check validation of data (i.e. SSN just number), then check that Bought Car VIN (primary and foreign key at the same time) not empty and unique. If Car VIN is already in DB (buyer table), error message appears and the process is canceled because relationship between buyer and car one to many.

if there is no error in condition above, information message appears to indicate the successful process.

F. Find Employee

- Search by Company ID

When the user enters the Company ID who are looking for and press Search button, the first step program check if the input data is valid (Company ID just number), then check that there is an employee has entered ID. If not, below error message appears.

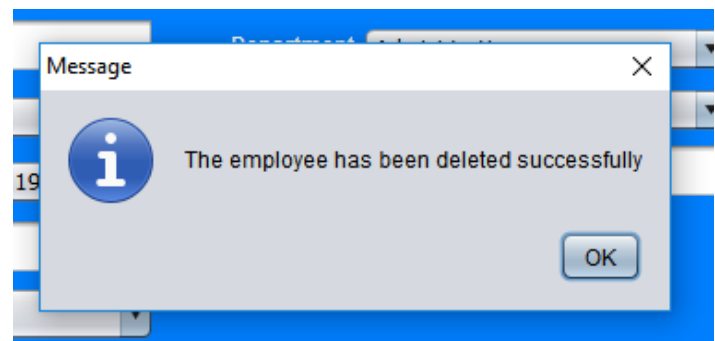
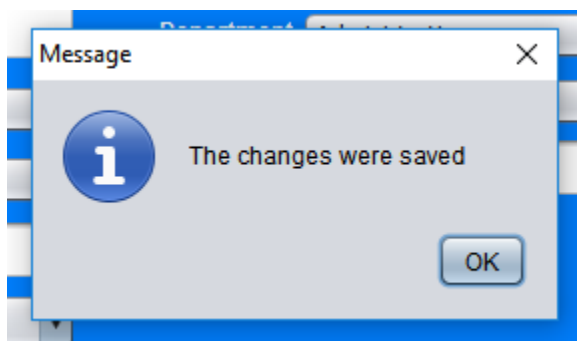


If there is no error in condition above, program get data from database and set them in text fields. After that options save changes and delete are enabled.

Save changes process conditions as same as add new employee process except company ID text box cannot be editable.

After saving changes, information message appears.

When user press Delete button, confirmation message appears to confirm the deletion process. If deleted employee was manager in some department, department manager ID set to null.



SSN 4435 Company ID 5555

First Name ahmed Password 53453

Select an Option

Are you sure you want to delete the Employee Company ID : 5555 Name : ahmed

Yes No Cancel

- Optional search

All option is empty, program will search for every employee and print some details about them in table.

Control Page - Moath AbuSada - General Administrator

Add Employee Add Department Add Car Add Engine Add Buyer Find Employee Find Department Find Car Find Engine F

Search by Company ID Optional Search

First Name

Gender

City

Department

Search

Company ID	First Name	Last Name	Gender	City	Department
8	fadi	shadid	Male	Tulkarem	Public Relation Ship
1	Built	Admin	Male	Tulkarem	Administration
2	Moath	AbuSada	Male	Tulkarem	Administration
5	noha	saleh	Female	Nablus	general
6	razan	emad	Female	Nablus	Public Relation Ship
4	fatima	shadid	Female	Jerusalem	Maintaince
3	majd	abusada	Male	Jericho	Sales
7	ahmed	mansour	Male	Hebron	general

City = Tulkarem & Department = administration & gender = male

Control Page - Moath AbuSada - General Administrator

[Add Employee](#)
[Add Department](#)
[Add Car](#)
[Add Engine](#)
[Add Buyer](#)
[Find Employee](#)
[Find Department](#)
[Find Car](#)
[Find Engine](#)
[F](#)

[Search by Company ID](#)
[Optional Search](#)

First Name
 Gender
 City
 Department

[Search](#)

Company ID	First Name	Last Name	Gender	City	Department
1	Built	Admin	Male	Tulkarem	Administration
2	Moath	AbuSada	Male	Tulkarem	Administration

Just gender = Male

Control Page - Moath AbuSada - General Administrator

[Add Employee](#)
[Add Department](#)
[Add Car](#)
[Add Engine](#)
[Add Buyer](#)
[Find Employee](#)
[Find Department](#)
[Find Car](#)
[Find Engine](#)
[F](#)

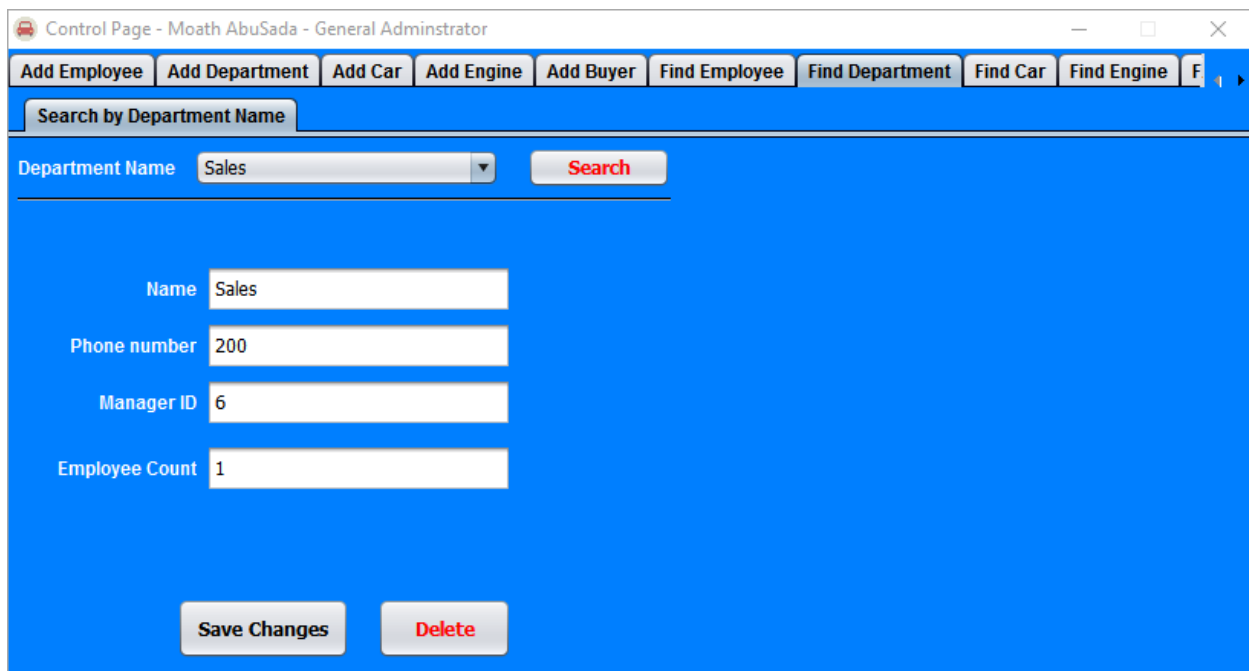
[Search by Company ID](#)
[Optional Search](#)

First Name
 Gender
 City
 Department

[Search](#)

Company ID	First Name	Last Name	Gender	City	Department
8	fadi	shadid	Male	Tulkarem	Public Relation Ship
7	ahmed	mansour	Male	Hebron	general
1	Built	Admin	Male	Tulkarem	Administration
2	Moath	AbuSada	Male	Tulkarem	Administration
3	majd	abusada	Male	Jericho	Sales

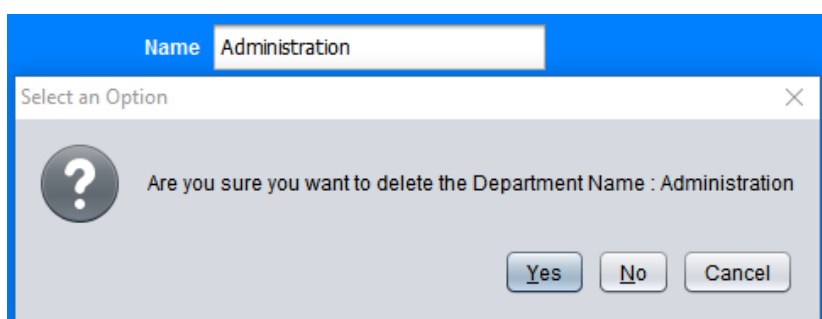
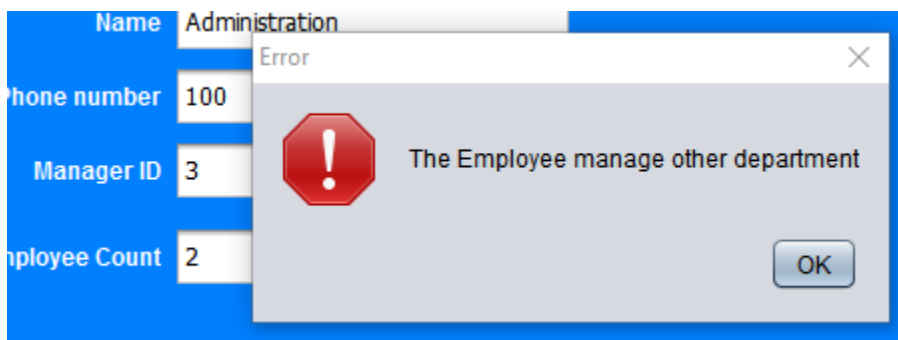
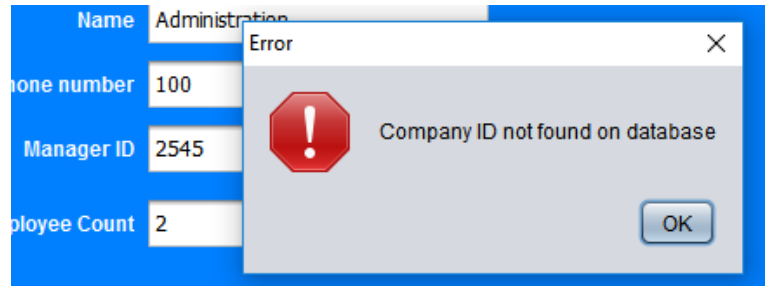
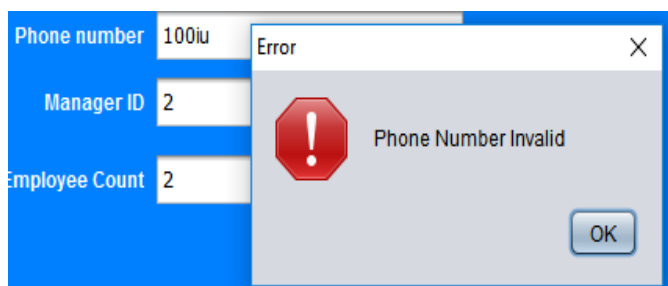
G. find Department by just name chosen from combo box, and this combo box Contents load directly from DB.



User can edit just phone number or manager ID. editing Manager ID process and check validation as the same of enter manager ID when add new department.

when department deleted refresh() method is called.

Some messages appear in different process:



H. Find Car

- Search by Car VIN

Control Page - Moath AbuSada - General Administrator

Add Employee Add Department Add Car Add Engine Add Buyer Find Employee Find Department Find Car Find Engine F

Search by Car VIN Optional Search

Car VIN 123 Search

Make volkswagen

Model polo

Vin Number 123

Engine Number 951357

Production Year 2015

Condition New

Traveled Distance(KM) 0

Transmission Manual

Number of Seat 5

Seat Cover Cloth

Exterior Design HatchBack

Price (USD) 65000

☒ Electric Windows

☐ Electric side mirro

☐ Sunroof

☒ Alloy wheels

☐ Daytime running lights

☒ Fog lamp

Other exterior features

Sensor ☐ Front ☒ Rear ☐ Side ☐ Rain ☐ Camera

Airbags ☒ Driver ☐ Side ☒ Front ☐ More

☒ Air Conditioning

☐ AUX ☐ USB

☐ Navigation System

☒ Central Locking

☒ Multifunction Steering Wheel

☒ ABS

☒ ESP

☐ Adaptive Cruise Control

☐ Collision Avoidance System

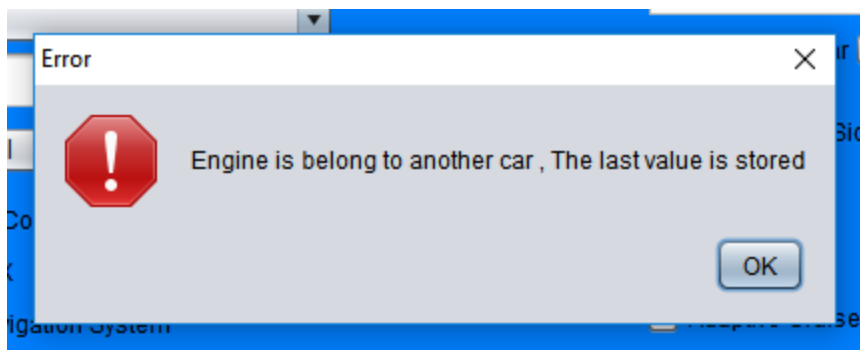
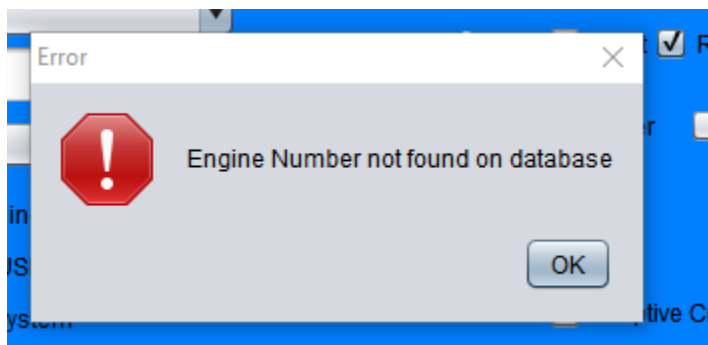
☐ Traction control

☒ Immobilizer

☒ Available Now

VIN Number Cannot be editable.

Some messages appear in different process:



- Optional search

No option selected so get all car

Control Page - Moath AbuSada - General Administrator

Add Employee Add Department Add Car Add Engine Add Buyer Find Employee Find Department Find Car Find Engine F

Search by Car VIN Optional Search

Make Alloy wheels ☐

Model Sunroof ☐ Search

Transmission Available Now ☐

Exterior Design

Price (USD) To

Car VIN	Make	Model	Transmissi...	Exterior De...	Price	Alloy Wheel	Sun Roof	Available N...
999	chevrolate	camaro	Automatic	Sport	1222000	Y	Y	Y
123	volkswagen	polo	Manual	HatchBack	65000	Y	N	Y
147	kia	sportage	Automatic	Saloon	122000	Y	N	Y
789	honda	civic	Semi Auto...	HatchBack	55000	Y	N	Y
456	skoda	octavia	Manual	Saloon	85000	Y	N	Y

price range 50000 to 100000 and transmission manual

Control Page - Moath AbuSada - General Administrator

Add Employee Add Department Add Car Add Engine Add Buyer Find Employee Find Department Find Car Find Engine F

Search by Car VIN Optional Search

Make Alloy wheels ☐

Model Sunroof ☐ Search

Transmission Available Now ☐

Exterior Design

Price (USD) To

Car VIN	Make	Model	Transmissi...	Exterior De...	Price	Alloy Wheel	Sun Roof	Available N...
123	volkswagen	polo	Manual	HatchBack	65000	Y	N	Y
456	skoda	octavia	Manual	Saloon	85000	Y	N	Y

K. Find Engine

-Search by Engine number

Control Page - Moath AbuSada - General Administrator

Add Car Add Engine Add Buyer Find Employee Find Department Find Car Find Engine Find Buyer Log Out

Search by Engine Number Optional Search

Engine Number 2589764 Search

Number 2589764

Capacity(cm3) 4500

Power(PS) 410

Fuel Type Petrol

Fuel Consumption(KM/L) 8

Additions super charger turbo

Car VIN Number 999

Save Changes Delete

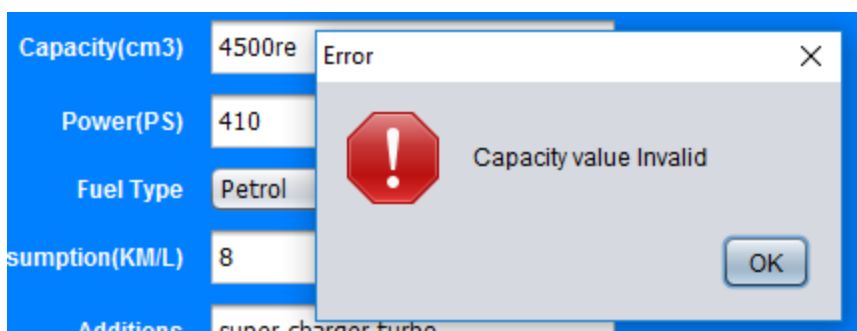
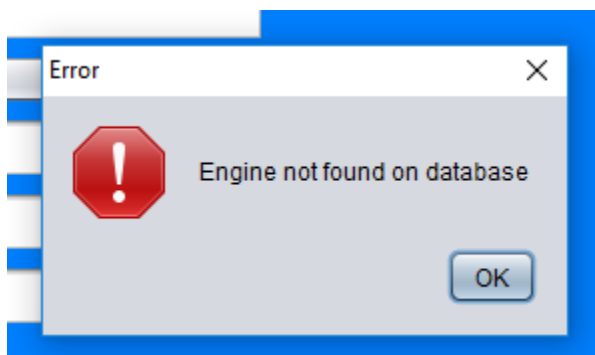
Number and Car VIN cannot be editable.

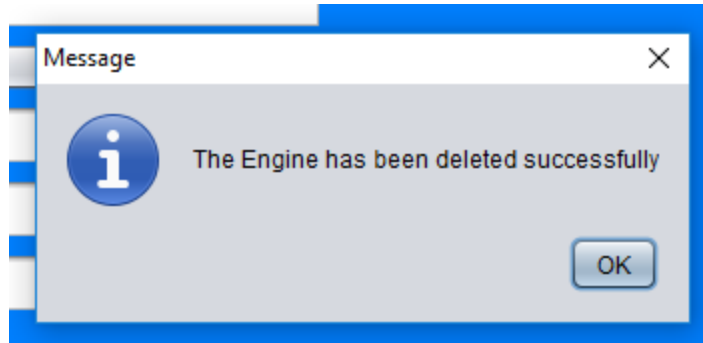
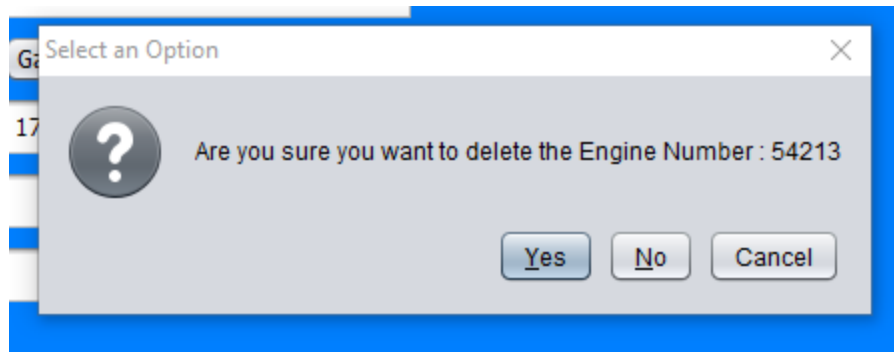
If the engine not in some car, car vin field empty

Additions

Car VIN Number

Some messages that appear in different process:





- Optional search

Just get all engine

Control Page - Moath AbuSada - General Adminstrator

[Add Employee](#)
[Add Department](#)
[Add Car](#)
[Add Engine](#)
[Add Buyer](#)
[Find Employee](#)
[Find Department](#)
[Find Car](#)
[Find Engine](#)

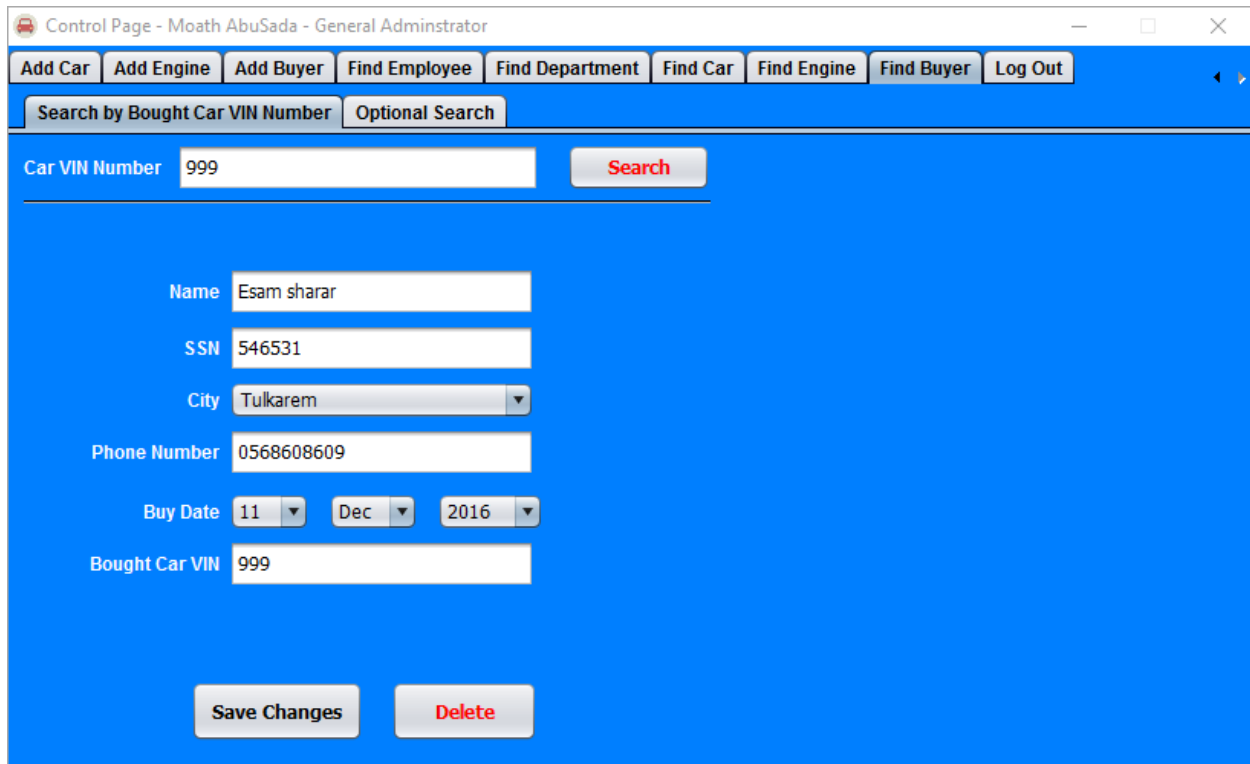
[Search by Engine Number](#)
[Optional Search](#)

Search for all engines

Engine Number	Capacity	Power	Fuel Type	Fuel Consumption	Additions
147963	2500	210	Diesel	10	double turbo
159753	1600	105	Petrol	15	tdi
963852	1800	120	Hybrid	19	blue motion
951357	1200	95	Diesel	18	tsi
2589764	4500	410	Petrol	8	super charger turbo

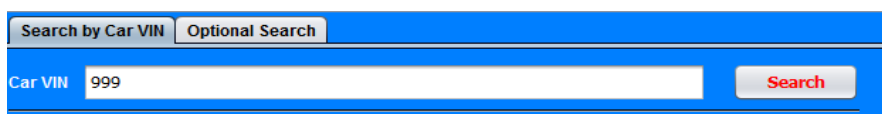
I. Find Buyer

-Search by car VIN which bought



Save changes and delete process as in the previous but I want to explain an exceptional case here by steps

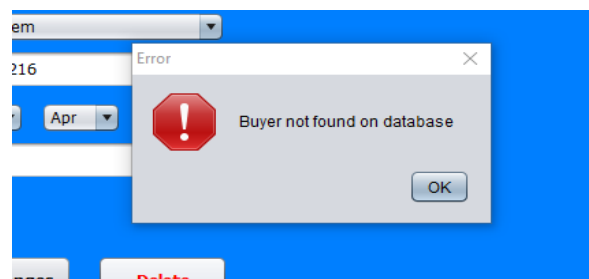
- 1- Find Buyer who buy car vin 999 (which actually bought)
- 2- tow button save changes and delete will be enable
- 3- I got to find car by vin number and find 999 car vin then delete it



4- in my database the relationship between car and buyer many to one

And car vin primary key and foreign key in buyer table, also in (when delete constrains on foreign key deletion done cascade), so buyer deleted from buyer table.

5- I go back to find buyer page and do some changes then press save changes or do deleting to buyer, below error message will appear because I defined method or trigger to check if the buyer is still in DB. This principle applies to both the editing and delete processes in program.



- optional search

Control Page - Moath AbuSada - General Administrator

Add Car Add Engine Add Buyer Find Employee Find Department Find Car Find Engine Find Buyer Log Out

Search by Bought Car VIN Number Optional Search

Name

City

Buy Date To

Search

Name	SSN	City	Phone Number	Buy Date	Bought Car VIN
Esam sharar	546531	Tulkarem	0568608609	Sun Dec 11 00:00:00...	999
islam kittaneh	5486312	Jerusalem	05974216	Wed Apr 06 00:00:00...	123
saleem abusada	5486312	Jenin	0598157748	Tue Dec 31 00:00:00...	456

Buy date from 4 may 2010 to 1 Jan 2014

City

Search

Buy Date 4 May 2010 To 1 Jan 2014

Name	SSN	City	Phone Number	Buy Date	Bought Car VIN
islam kittaneh	5486312	Jerusalem	05974216	Wed Apr 06 00:00:00 GMT+02:00 2011	123
saleem abusada	5486312	Jenin	0598157748	Tue Dec 31 00:00:00 GMT+02:00 2013	456