



Nan Air - Rentals

Ingvar Árnason, Arnar Már Jónasson, Arnór Þorleifsson, Arnþór Árni Logason,
Haraldur Steinar Skúlason

Introduction

Í þessari skýrslu undirbúum við forrit fyrir ökutækjaleigu Chuck Norris. Þar með greinum við út frá texta hvaða kröfur eru settar fyrir forritið og útbúum notkunar tilfelli, notendasögur, kröfulistu, klasarit og þó nokkur stöðurit. Út frá því skipuleggjum við síðan hvernig forritið ætti að virka og hönnum okkar eigin útfærslu á þessu forriti. Þegar hönnunarvinnan er búin forritum við í samræmi við hana og endurbætum þá hönnunina eftir þörfum.

User stories

descriptions of actions the user wants to be able to achieve

Number	User Stories	Priority
1	As an employee of NaN Air, I need to be able to deliver and receive back rental cars	A
2	As an employee of NaN Air, I need to be able to check on a vehicle's status and if it's in good enough shape to be rented out	A
3	As Chuck Norris and/or employee of NaN Air I need to be able to register new employees, a list of their information, and their position	A
4	As an employee of NaN Air I need to be able to put together a rental contract	A
5	As an employee of NaN Air I need to be able to find an employees information and edit it	A
6	As an employee of NaN Air I need to be able to register new vehicles into a list of all vehicles	A
7	As an employee of NaN Air I need to be able to list all vehicles according to location and availability	A
8	As an employee of NaN Air I need to be able to list all vehicles according to location and damage status	A
9	As an employee of NaN Air I need to be able to update the damage status of a vehicle	A
10	As an employee of NaN Air I need to be able to register and list all rental contracts	A
11	As an employee of NaN Air I need to be able to update a rental contract to register the return time of a vehicle	A
12	As an employee of NaN Air I need to be able to change the loan time and vehicle of the rental contract	A
13	As an employee of NaN Air I need to be able to invalidate a rental contract	A
14	As an employee of NaN Air I need to be able to register new destinations and list all of them	A
15	As an employee of NaN Air I need to be able to print an invoice based on the information on the rental contract	A
16	As an employee of NaN Air I need to be able to see and edit how high the taxes are for each type of vehicle and add taxes to new types of vehicles	Bds

17	As an employee of NaN Air I need to be able to see if the customer has the credentials to use certain types of vehicles	B
18	As an employee of NaN Air I need to make sure that the customer's charges are collected so that he will not get charged multiple times	B
19	As an employee of NaN Air I need to be able to make a report of my branch's performance	B

Rent a green Toyota Jimny in Kulusuk.

Ljótur Karlsson wants to go for a day trip to Kulusuuk to buy some kúlusúkkulaði.

Ljótur starts by going to NaN air offices in Reykjavík where employee 2 services him. When Mr. 2 is able to see the available cars in Kulusuuk at the click of a button and by filtering by color and model, he finds out that there are two green Jimnies and two white free flies available in Kulusuuk, Ljótur selects the Jimny it is a regular sized car so Jóhann only needs a valid driver's license.

The employee then drafts the contract, he sees that Ljótur is a first time customer and fills in all the needed information about him, the time he will receive the car and need to return it, the car, and the computer automatically registers the date when the contract is being drafted and logs the logged in user as the signing employee.

Ljótur flies to Kulusuuk that same day and is greeted by employee 5 of Kulusuuk, which loans him the car he requested. Once that's done, Mr. 5 reports to the system that the customer received his car.

Ljótur returned the car six days later, that's 5 days later than what the contract said and he got a penalty, resulting in a 20% increase to his bill before tax and the time charged changed to the time he actually had the car.

Ljótur's customer ID gets 3 (one) GBP (Good Boy Points) for renting a car and one BBP (Bad Boy Points) for returning the car late.

Mr. 5 informs Ljótur that he can use his GBP later to get better prices and special offers, but also warns him that if he gets more than 50 BBP it will result in a roundhouse kick from the boss.

When Ljótur arrives in Reykjavík, he gets his bill sent to his address and must go to NaN air offices in person to pay the price of 492000 ISK.

baseprice = 10000 isk*6 days = 60,000 isk

Light road tax rate = 700% increase

late tax = 20% increase

GBP used = 0

$10,000 * (1 + ((20 + 700) / 100)) - 0 * 1000 = 492000 \text{ ISK}$

Requirements

the base requirements of the program will be listed here below

1. Handle contacts
2. Register a new car
3. Input car info(if it's out for rental or in the shop)
4. Make a printable report
5. Handle employee information
6. Rent cars
7. Get maintenance service for cars
8. Make a printable bill
9. Maintain each destinations status
10. maintain companies statistics
11. Maintain customer information
12. Register a new employee
13. Handle car information

Use cases

here we describe all use cases in further detail

Nafn	view contract
Number	1
Description	employee finds a contract and views it
Priority	medium
Author	Haraldur Steinar Skúlason
source	1
Precondition	contract has been made and signed
Postcondition	employee has viewed contract and gives info to costumer

user wants to be able to view contract

Nafn	Make contract
Number	2
Description	employee inputs contract information to create contract
Priority	high
Author	Haraldur Steinar Skúlason
Source	1
Precondition	customer has decided to rent a car
Postcondition	customer has rented a car and is now happy

user has to be able to create a new contract

Nafn	Change contract
Number	3
Description	employee finds contract and changes it
Priority	medium
Author	Haraldur Steinar Skúlason
Source	1
Precondition	contract has been made and has been requested to be changed
Postcondition	contract has been changed

user wants to be able to change contracts that have been made

Nafn	See list of cars
Number	4
Description	look at a list of cars
Priority	low
Author	Haraldur Steinar Skúlason
Source	13
Precondition	employee wants to look at what cars we have
Postcondition	employee has looked at car list

user wants to be able to see a list of cars available

Nafn	Preview rental report
Number	5
Description	employee finds a report of a rental case and view it
Priority	high
Author	Haraldur Steinar Skúlason
Source	4
Precondition	rental car has been returned and reviewed
Postcondition	employee and customer have now seen the report

user will want to be able to view report of finished rental contract

Nafn	Preview printable bill
Number	6
Description	employee finds rental case in end of rent and previews printable bill
Priority	high
Author	Haraldur Steinar Skúlason
Source	8
Precondition	car has been returned and report has been looked at
Postcondition	customer has now seen the bill

user wants to use be able to print and preview printable bill

Nafn	Change employee information
Number	7
Description	employee or chuck norris finds employee in program and changes its information
Priority	medium
Author	Haraldur Steinar Skúlason
Source	5
Precondition	employee has decided to change information
Postcondition	employee information has been changed

user wants to be able to change information of employee of the company

Nafn	Delete employee
Number	8
Description	employee finds quitting employee and deletes it
Priority	low
Author	Haraldur Steinar Skúlason
Source	5
Precondition	employee has been fired or quit working at the car rental
Postcondition	employee has been deleted from the database

user wants to delete an employee if it has been fired or left the company

Nafn	Preview overview of revenue, efficiency and bills for certain period
Number	9
Description	chuck norris selects a certain period and the program displays statistics of it
Priority	low
Author	Haraldur Steinar Skúlason
Source	10
Precondition	a certain period has passed and chuck norris is curious how he did
Postcondition	the overview has been viewed

user wants to be able to view how the company has performed over certain time period

Nafn	preview statistics and info of certain rental car service destination
Number	10
Description	chuck norris selects a certain location and selects to view statistics and info
Priority	low
Author	Haraldur Steinar Skúlason
Source	11
Precondition	a certain period has passed and chuck norris is curious how he did
Postcondition	the overview has been viewed

user might want to view how a certain vehicle rental location is doing

Nafn	use loyalty points
Number	11
Description	when employee rents out a car and selects if costumer wants to use loyalty points
Priority	medium
Author	Haraldur Steinar Skúlason
Source	12
Precondition	employee asks customer if he wants to use loyalty points and customer says yes
Postcondition	loyalty points have been used and discount has been used

user might want to let customer use loyalty points

Nafn	add new employee
Number	12
Description	employee inserts new employee info and new employee is registered
Priority	high
Author	Haraldur Steinar Skúlason
Source	5
Precondition	new employee has started working at the car rental and has not yet been added to the database
Postcondition	employee has been added to the database

user might need to add a new employee to the system

Nafn	add new vehicles
Number	13
Description	employee registers new vehicles info into database and new vehicle is added
Priority	high
Author	Haraldur Steinar Skúlason
Source	2
Precondition	car rental has received a new vehicle and has reviewed its information
Postcondition	car information has been added to the database

user might need to add a new vehicle to the system

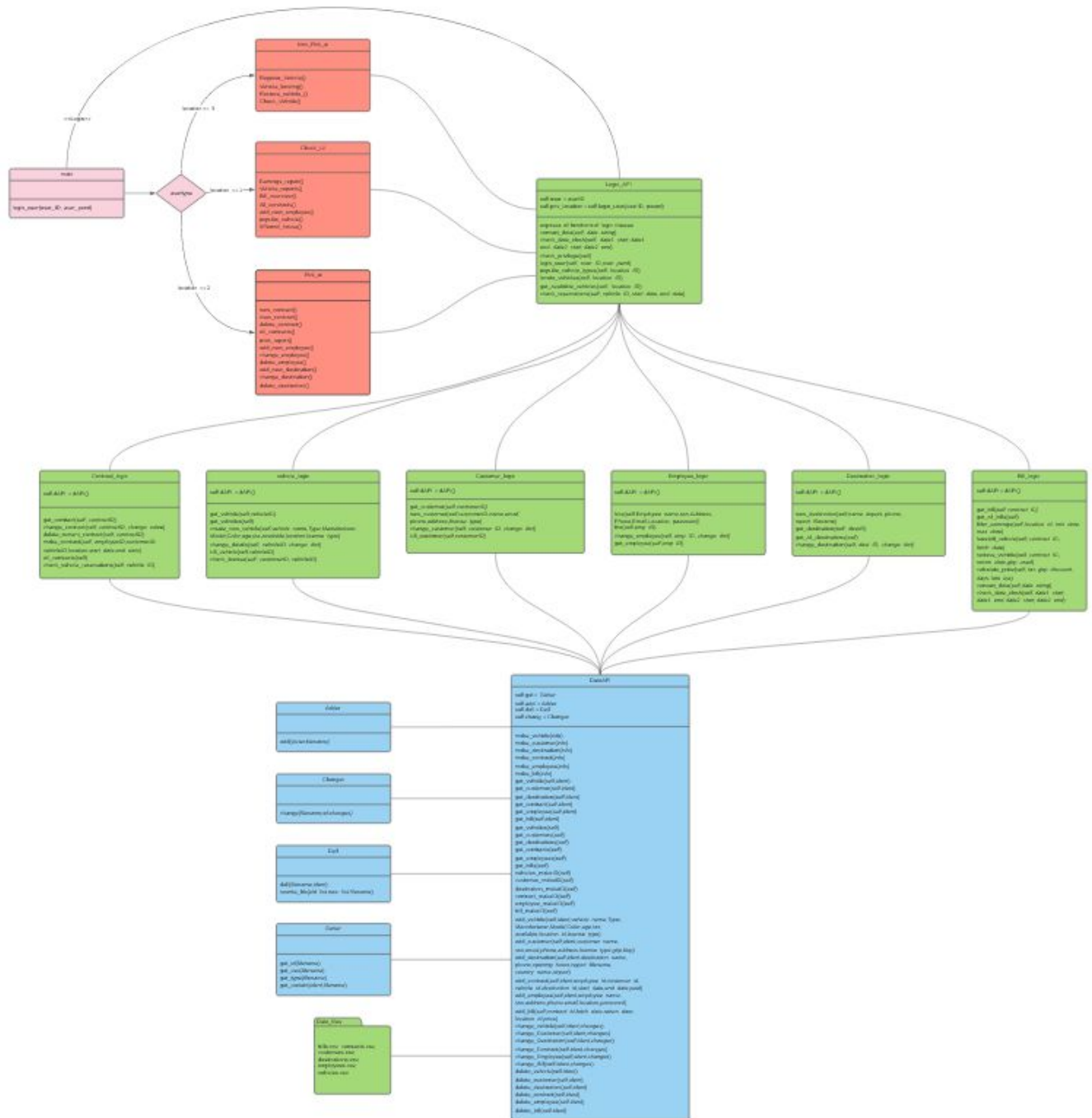
Nafn	register if vehicle is in good enough condition to be rented
Number	14
Description	employee reviews car on arrival and registers if car is in good enough condition to be rented
Priority	medium
Author	Haraldur Steinar Skúlason
Source	3
Precondition	car has been returned
Postcondition	employee has reviewed car and can now add it to the report

user might need to change the condition of a vehicle

Nafn	see vehicle usage statistics in certain location
Number	15
Description	chuck norris selects to check vehicle usage statistics then selects a location and view vehicle usage statistics of that location
Priority	low
Author	Haraldur Steinar Skúlason
Source	13
Precondition	vehicle usage statistics are in the system and chuck wants to see them
Postcondition	chuck norris has seen vehicle usage statistics

user might need to see what vehicle is most popular for each location

Class diagram

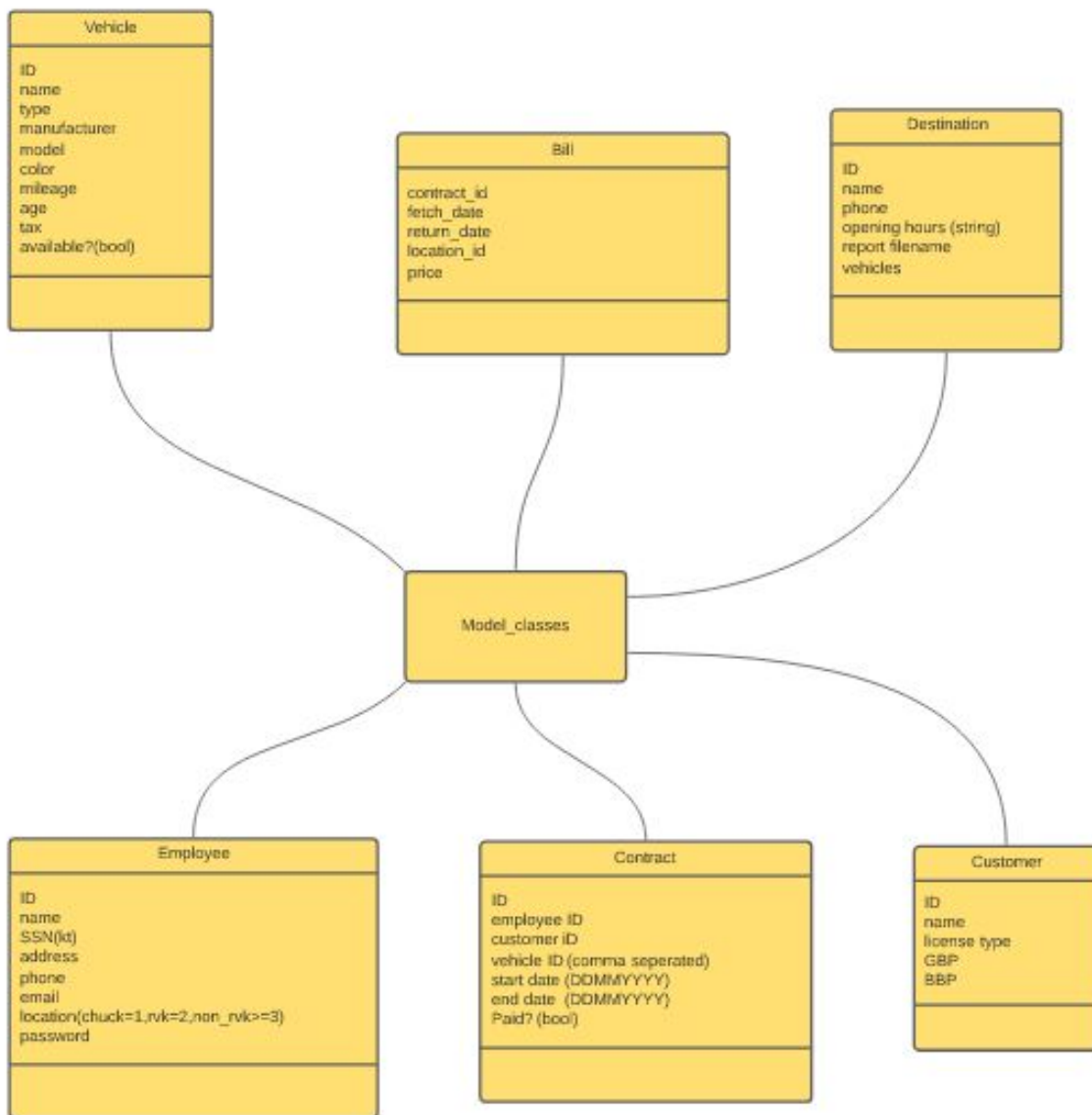


Link to chart (for better view):

<https://lucid.app/documents/view/babfbe2f-7c48-45bf-9f51-145cd8ec30b9>

Model classes

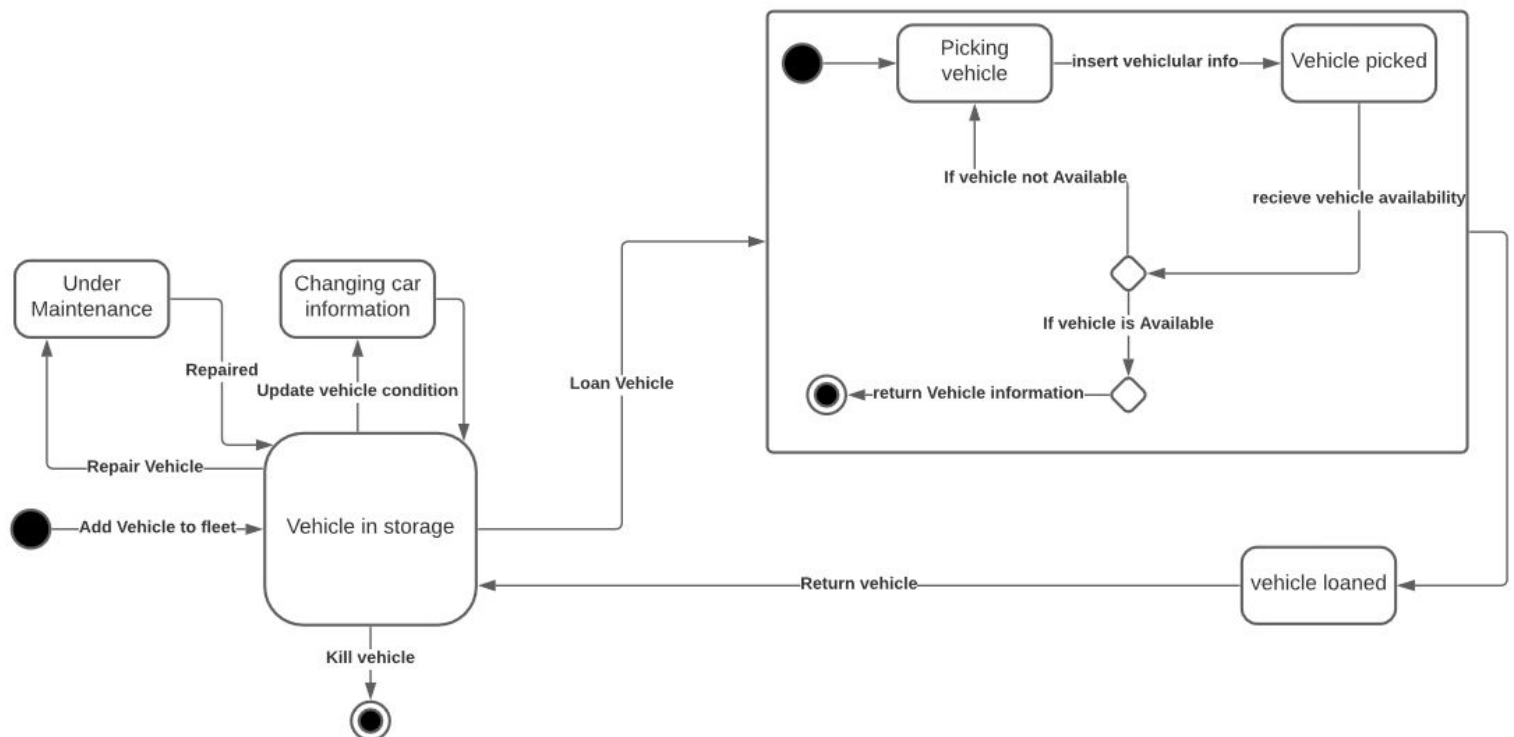
class diagram that has all information about model classes and attributes



State diagram

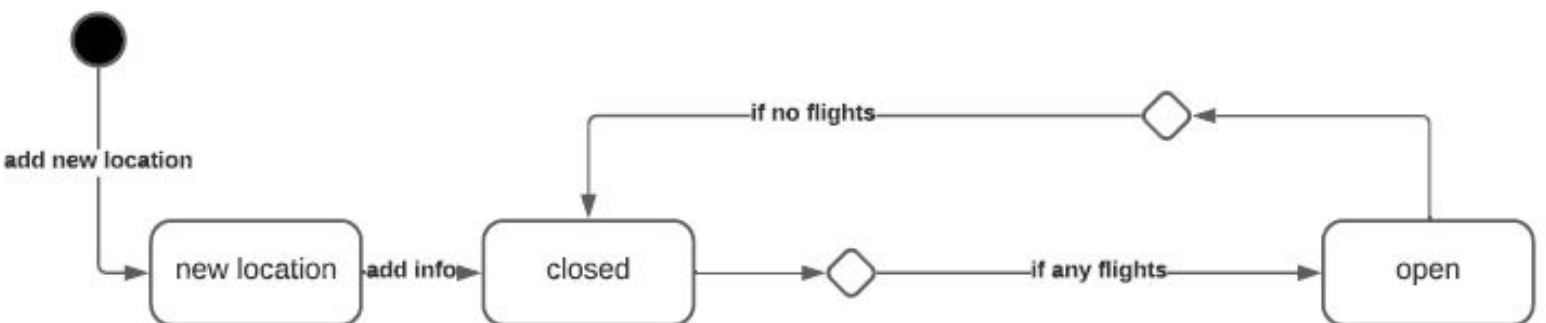
Vehicle states

State diagram with info of available states of cars



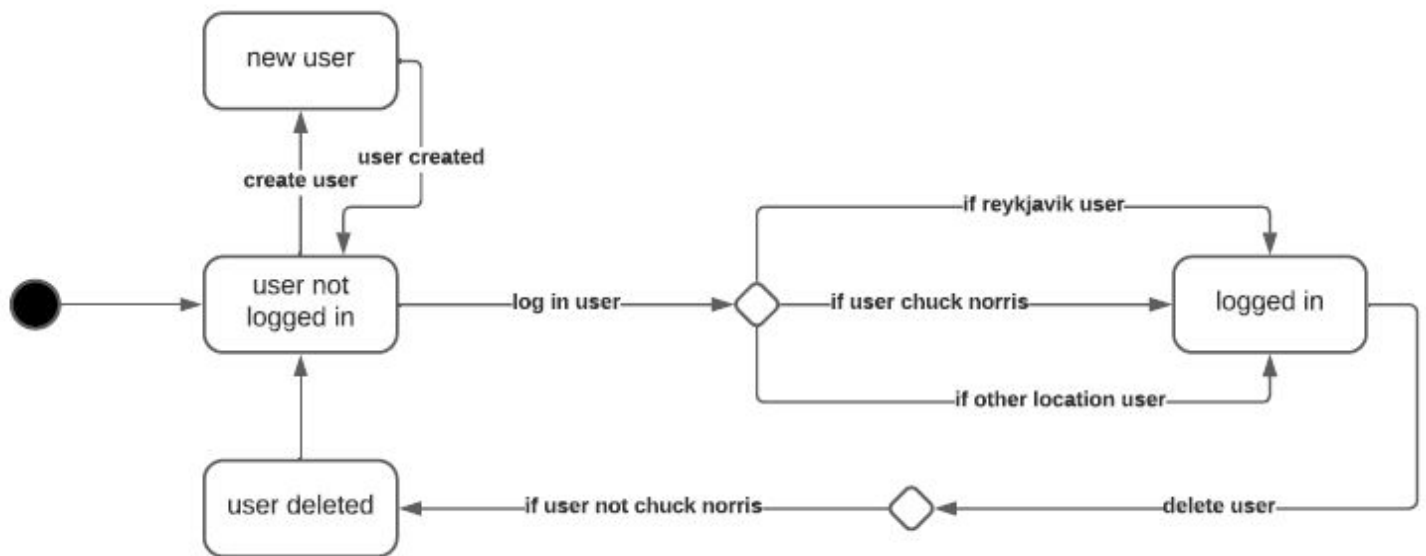
Location states

State diagram with info of available states of locations



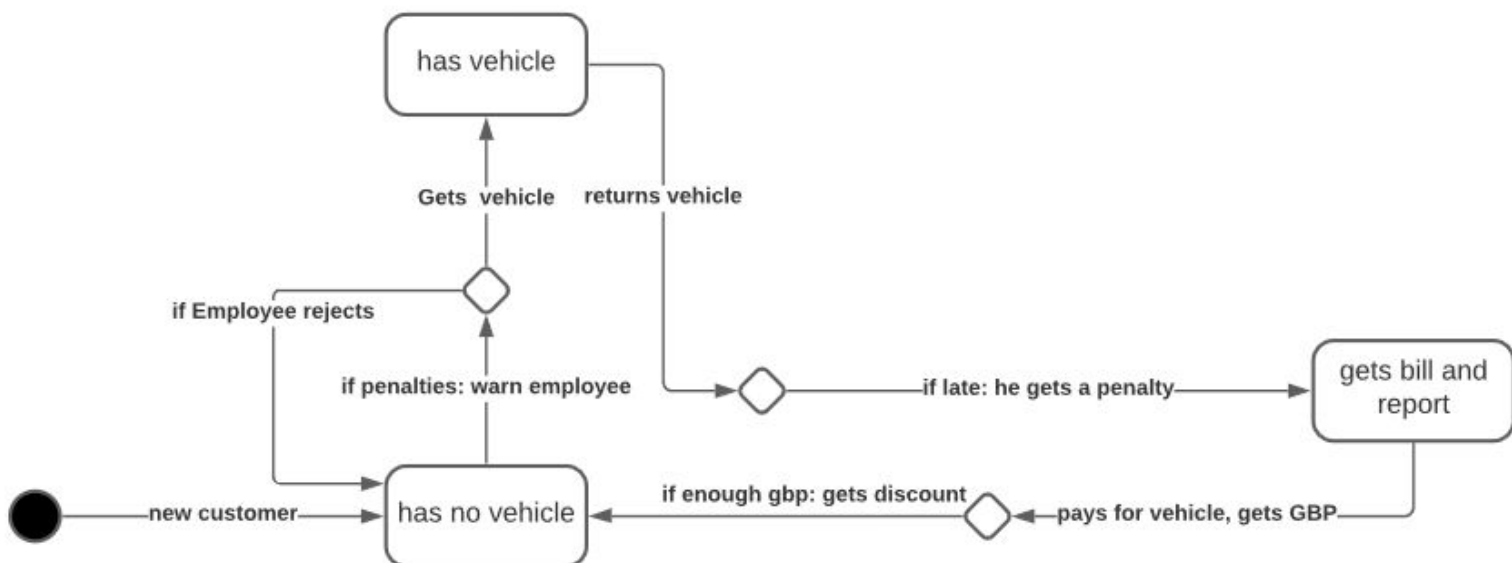
User states

State diagram with info of available states of users



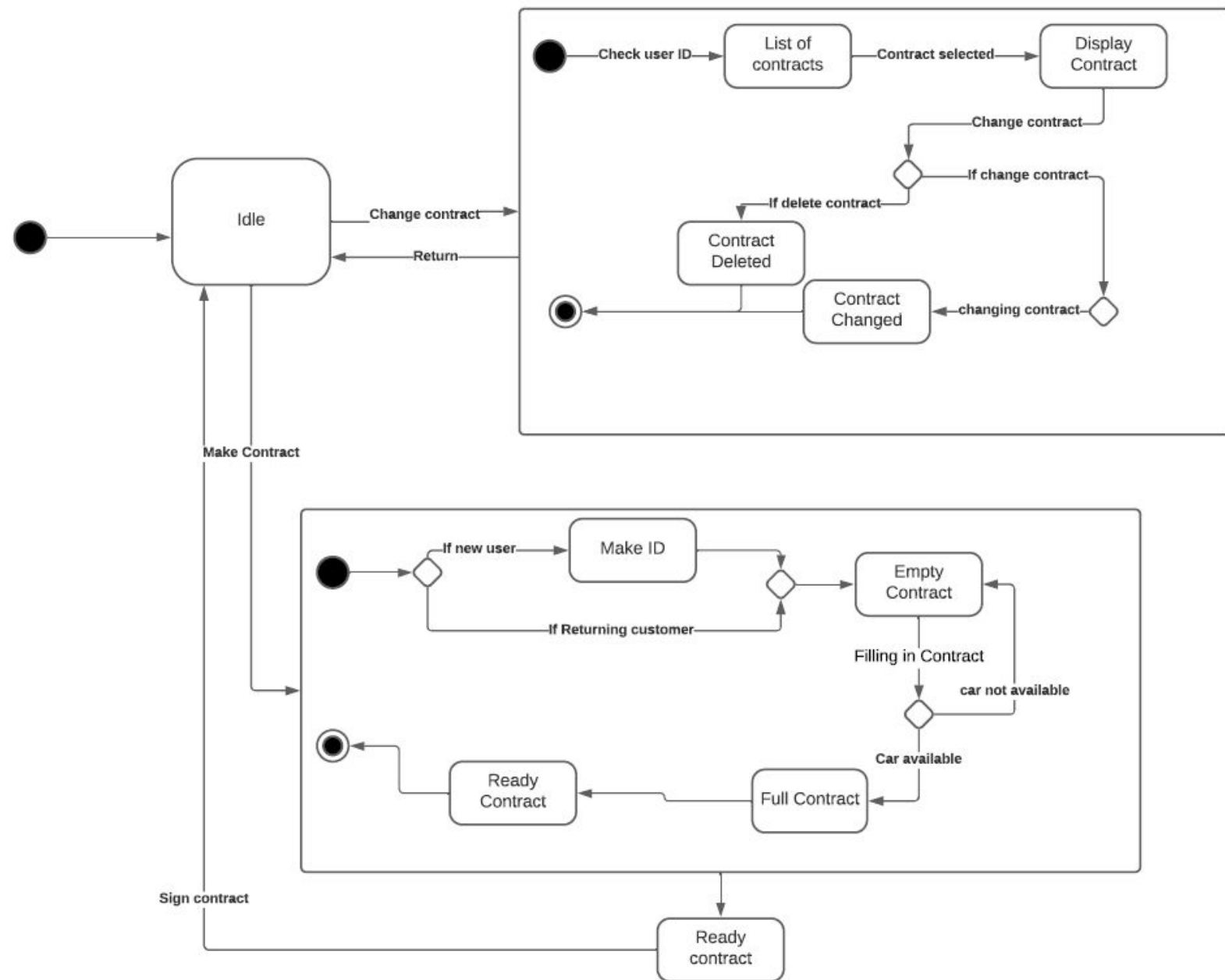
vehicle renting states

state diagram with info of available states of vehicles



Contract states

State diagram with info of available states of contracts



User analysis

an analysis of what users the system has to be able to accomodate

Employee in Rvk	Employee not in Rvk	Chuck Norris
Age:18-65 Gender:Both Education:Basic Abilities: None Computer skills: Substantial	Age:18-65 Gender:Both Education:Basic Abilities: None Computer skills: Substantial	Age:80 Gender:Male Education:Basic Abilities: All of them Computer skills: Sufficient
Main user goals: To make rental contracts, input data in database	Main user goals: Track status for on-location vehicles	Main user goals: Track company overview
Device: Computer	Device: Computer	Device: Computer
Location of use: Reykjavík office	Location of use: Any company office(=!Rvk office)	Location of use: Office, home
When: Whenever software use is needed, likely during usual work hours	When: Whenever software use is needed, likely during usual work hours	When: Whenever software use is needed
Importance of group:Very important	Importance of group:Very important	Importance of group:Very important

UI design

this is a first edition design of the UI for our program and all screens that the users might need

Chuck Norris menu (Chuck_ui)

All UI screens that only Chuck Norris can access

Welcome Master Chuck!	
(1)	Review Earnings Report
(2)	View Vehicle Reports
(3)	View Bill Overview
(4)	Roundhouse Kick
(5)	View All Contracts
(6)	Register New Employee
(7)	Most Popular Vehicles
(q)	quit
Enter Choice here:	

Review Earnings Report (Menu 1)

Earnings Report	
Date Format = (yy.mm.dd)	(c) Cancel
Input Location ID	: empty
Input Date From	: empty
Input Date To	: empty
Enter Input here:	

View Vehicle Reports (Menu 2)

Vehicle Reports											
ID	Plate	Type	Manufacturer	Mode	Color	Age	Tax	Available	Location id	Licence type	
1	GR15869	Medium Road	TAILG	Free Fly II	white	2018	80	yes	4	B	
2	GR15869	Medium Road	TAILG	Free Fly II	white	2018	80	yes	4	B	
3	Kayak	Light water	Kayman	Kayaks Crazy	yellow	2020	8	yes	3	OK	
.	
.	
.	

return:

View Bill Overview (Menu 3)

Bill Overview					
Contract ID	Start Date	Return Date	Location ID	Price	
1	2020.11.4	2020.11.6	6	24000.0	
2	2020.11.11	2020.11.13	6	24000.0	
3	2020.11.18	2020.11.20	6	24000.0	
.	
.	
.	

return:

Roundhouse Kick (Menu 4)

Earnings Report	
(1) Kill Customer	(2) Fire Employee

Enter Choice here:

Kill Customer

Enter victim's customer ID : 037188558

THIS IS NAN AIR!

○ < Chuck Norris

<|/

/

└┐ _

V Ljotur Karlsson V

└┐ _

\○/

└┐ _

\ /

└┐ _

/

└┐

└┐

Fire Employee

Enter victim's employee ID: 4

THIS IS NAN AIR!

○ < Chuck Norris

<|/

/

└┐ _

└┐ _

└┐ _

└┐ _

└┐

V Spoi Eskimoi V

\O/

\ /

/

[WARNING]
FOR THE STABILITY OF THE TIME-SPACE CONTINUUM AND ALL UNIVERSAL
CONSTANTS, DO NOT ROUNDHOUSE KICK YOURSELF
•THE CHUCK NORRIS FOUNDATION

Enter victim's employee ID: 1

G_ p*- u~ c~ - k~
N_ r~ i~ s~
a
t~ m~ t~
a
t~ i~
h~ s~
f~ e~
w~ d~

```

i
e
h
a
n
e
e
a
i
e
e
a
y

```

View All Contracts (Menu 5)

Contract search_____

(r) return

ID	employee_id	customer_id	vehicle_id	destination_id	start_date	end_date	paid?
2	1	1	13	6	2020.11.11	2020.11.13	no
3	1	1	13	6	2020.11.18	2020.11.20	no
4	1	1	13	6	2020.11.25	2020.11.27	no
.
.
.

Return:

Register New Employee (Menu 6)

New employee_____

(c) cancel (f) finish (s) skip

name : empty

ssn : empty

address : empty

location id : empty

email : empty

phone : empty

password : empty

confirm password : empty

Enter Choice here:

Most Popular Vehicles (Menu 7)

New employee	
(c) cancel	
Pick Location ID To See: :empty	
Enter Location ID:	

Not a Reykjavik employee menu (Non_rvk_ui)

all ui screens related to the employee outside of RVK menu

welcome Employee 4	
(1) Register New Vehicle	
(2) Loan Vehicle	
(3) Recieve Vehicle	
(4) Check Vehicle	
(5) Change Vehicle	
(q) quit	
Enter Choice here:	

Register New Vehicle (Menu 1)

Register New Vehicle	
Vehicle name	: empty
type	: empty
manufacturer	: empty
model	: empty
color	: empty

year made	: empty
tax	: empty
available	: empty
location id	: empty
licence type	: empty

Enter Choice here:

Loan Vehicle (Menu 2)

Loan Vehicle

input contract ID :

Error Message

| there is one or more wrong input! |

Recieve Vehicle (Menu 3)

Loan Vehicle

input contract ID :

Input vehicle condition(ok/bad): :

Is this vehicle late(y/n): :

Error Message

| there is one or more wrong input! |

Check Vehicle (Menu 4)

Contract search

Enter vehicle ID: 12 *exmple input*

ID	Plate	Type	Manufacturer	Mode	Color	Year made	Tax	Available	Location id	Licence type
12	Jimny	Light road	Toyota	Jimny	green	2017	20	yes	5	B

Wish to check on more vehicles? y/n:											
Error message											
Contract search											
Enter vehicle ID: haha											
ID	Plate	Type	Manufacturer	Mode	Color	Year made	Tax	Available	Location id	Licence type	
None											
Wish to check on more vehicles? y/n:											

Change Vehicle (Menu 5)

Vehicle Search			
(r) return		Insert ID below	
Vehicle ID: 12			
<i>example input</i>			
Changing vehicle			
(c) cancel	(f) finish	(d) delete	(s) skip
color		: green	
available		: 20	

RVK employee menu (Rvk_ui)

all ui screens related to the RVK employee menu

Welcome Employee 1	
(1)	Contract menu
(2)	Employee menu
(3)	destination menu
(4)	vehicles menu
(q)	quit

Type here:

Contract menu (Menu 1)

Contract menu	
(1)	Create contract
(2)	View Contract
(3)	Delete Contract
(4)	Print all contracts
(5)	Print Report

(r) return

Type here:

Create contract (Menu 1-1)

Create contract		
(1) Returning Customer	(2) New Customer	(r) return

Type here:

Returning customer (Menu 1-1-1)

Returning customer		
(c) cancel	(f) finish	
customer ID	: 2	<i>example input</i>

Enter Choice here:

New Contract		
(c) cancel	(f) finish	
start date (YYYY.MM.DD) : empty		
end date (YYYY.MM.DD) : empty		
vehicle id : empty		
destination id : empty		

Enter Choice here:

New customer (Menu 1-1-2)

New customer	
(c) cancel	(f) finish
ID	: empty
customer name	: empty
ssn	: empty
email	: empty
phone	: empty
address	: empty
license type	: empty

Enter Choice here:

Contract search (Menu 1-2)

Contract search							
(r) return				Insert ID below			
Contract ID: 2							
<i>example input</i>							
Contract: 2							
(c) Change				(r) return			
ident	employee_id	customer_id	vehicle_id	destination_id	start_date	end_date	paid?
2	1	1	13	6	2020.11.11	2020.11.13	no

Type here: c
example input

Changing contract

(c) cancel	(f) finish	(s) skip
start date	: empty	
end date	: empty	
vehicle id	: empty	

Delete contract (Menu 1-3)

Contract search	
(r) return	Insert ID below
Contract ID: 26 <i>example input</i>	
Deleting contract	
(c) cancel	Are you sure you want to delete contract 26 (d) delete
Confirm:	

Print all contracts (Menu 1-4)

Contract search							
(r) return							
ID	employee_id	customer_id	vehicle_id	destination_id	start_date	end_date	paid?
2	1	1	13	6	2020.11.11	2020.11.13	no
3	1	1	13	6	2020.11.18	2020.11.20	no

4	1	1	13	6	2020.11.25	2020.11.27	no
.
.
.

Return:

Print report (Menu 1-5)

Bill of contract #26

too much information to fit in this box

Employee Menu (Menu 2)

Employee Menu

(1) Add Employee

(2) Change Employee

(3) Delete Employee

(4) View Employees

(r) Return

Contract ID:

Add Employee (Menu 2-1)

New employee

(c) cancel

(f) finish

name	: empty
ssn	: empty
address	: empty
location id	: empty
email	: empty
phone	: empty
password	: empty
confirm password	: empty

Enter Choice here:

Change Employee (Menu 2-2)

Employee search	
(c) cancel	write ID below!

employee ID: 2
example input

Employee search		
(c) cancel	(f) finish	(s) skip

address	: stufgata 5 105
phone	: 6498726
email	: simicool@chucknorris.is
location id	: 2
password	: 2
confirm password	: 2

Enter Choice here:

Delete Employee (Menu 2-3)

Employee search	
(c) cancel	Insert ID below!

employee ID: 4		
Deleting employee 4		
(c) cancel	Delete employee #4	(d) Delete

View employees(menu 2-4)

view employees						
id	employee name	ssn	address	phone	email	location
1	chuck norris	1004402509	svarhofdi 1	6969420	chuck@chuck	1
2	sigmundur david	2459731..	stufgata 5	649 9726	simmicool@chuck	2
3	Gudrun aradottir	121212121	brottubrekku	3102314..	gurra@chuck.com	3
...

destination menu (Menu 3)

Destination Menu	
(1) Add destination	
(2) Change destination	
(3) Delete destination	
(4) look up destination	
(5) Destination earning reviews	
(r) return	

Type here:

Add destination (Menu 3-1)

New Destination	
(c) cancel	Insert ID below!
destination name	: empty
country name	: empty
airport	: empty
phone	: empty
opening hours	: empty

Enter Choice here:

Change destination (Menu 3-2)

Destination search	
(c) cancel	Insert ID below!

Contract ID:

Change destination		
(c) cancel	(f) finish	(s) skip
Phone : empty opening hours : empty		
Enter input here:		

Delete destination (Menu 3-3)

Destination search	
(c) cancel	Insert ID below!
employee ID:	

Deleting Destination 4		
(c) cancel	Delete destination 4	(d) delete
Confirm:		

look up destination (Menu 3-4)

Deleting Destination	
(c) cancel	Insert ID below

Contract ID: 3						
<i>example input</i>						
Destination: nuuk						
(r) return						
ID	Destination_name	airport_code	Phone	country	opening hours	
3	nuuk	GOH	+299326005	10:00	greenland	
return:						

Destination earning (Menu 3-5)

Earnings Report	
Date Format = (YYYY.MM.DD)	(c) cancel
Input Location ID	: empty
Input Data From	: empty
Input Date To	: empty

Vehicle menu (Menu 4)

Vehicle Menu
(1) Search vehicle
(2) add type
(3) change type
(4) see vehicle type taxes
(r) return

Type here:

Search vehicle (Menu 4-1)

Search Vehicles	
(c) cancel	write ID below!
Location ID: 3 <i>example input</i>	

Vehicle Reports										
(r) return										
ID	Plate	Type	Manufacturer	Model	Color	Age	Available	Location id	Licence type	
3	Kayak	Light water	Kayman Kayaks	Crazy	yellow	2020	yes	3	OK	
6	cani435	Light off-road	Cani-Fit	Fat Max	black	2019	yes	3	OK	
19	GR 5234	Light road	Tesla	Buggy	pink	2020	no	3	OK	
Return:										

add type (Menu 4-2)

New Type	
(c) cancel	(f) finish
name : empty	
destination id : empty	
rate : empty	
Enter input here:	

change type (Menu 4-3)

type Search		
(r) return	Insert ID below	
type name	: Light road	<i>example input</i>
destination id	: 0	<i>example input</i>

Enter input here:

type Search		
(c) cancel	(f) finish	(s) skip
rate	: 700	

Enter input here:

see vehicle type taxes (Menu 4-4)

Vehicle type taxes			
(c) cancel	(f) finish	(s) skip	
Type name	Destination	Rate	
Light Road	All	700	
Light off-road	All	900	
Light water	All	850	
.	.	.	
.	.	.	
.	.	.	

return:

Summary

Í þessu verkefni nýttum við að hluta til alla þá áfanga sem kenndir voru yfir önnina. Hönnunin sem tók fyrstu viku þessa námskeiðs var að mörgu leyti hjálpsöm en breyta þurfti henni stórlega, þá helst klasaritið þegar forritunin sjálf tók við og vandamálin sem stóðu fyrir urðu skýrari. Stór hindrun hjá okkar hópi var 3-ja laga hönnunin sem var svo mikið fjallað um í byrjun námskeiðsins, okkur tókst þó að koma henni frekar skýrlega fram í forrituninni. Þetta verkefni var klárlega það umfangsmesta sem lagt var fyrir á þessu kennslutímabili og mikil reynsla fylgdi þessari vinnu.

Haraldur sá um data, Arnpór og Arnar sáu um UI og Arnór og Ingvar sáu um Logicið. Arnpór klippti sömuleiðis vídjóið