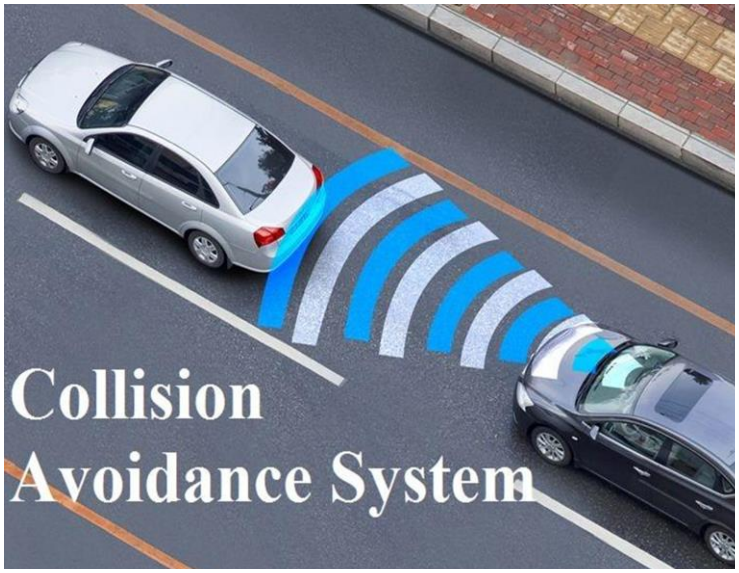



# Collision Avoidance Report

**[Learn in Depth]**

[Mastring Embedded Systems Online Course]

***Represented By : Mahmoud Karem Zamel***

***Supervisor : Eng / Keroles Shenouda***

# >> System Architecting/Design Sequence:

## 1-Case Study:

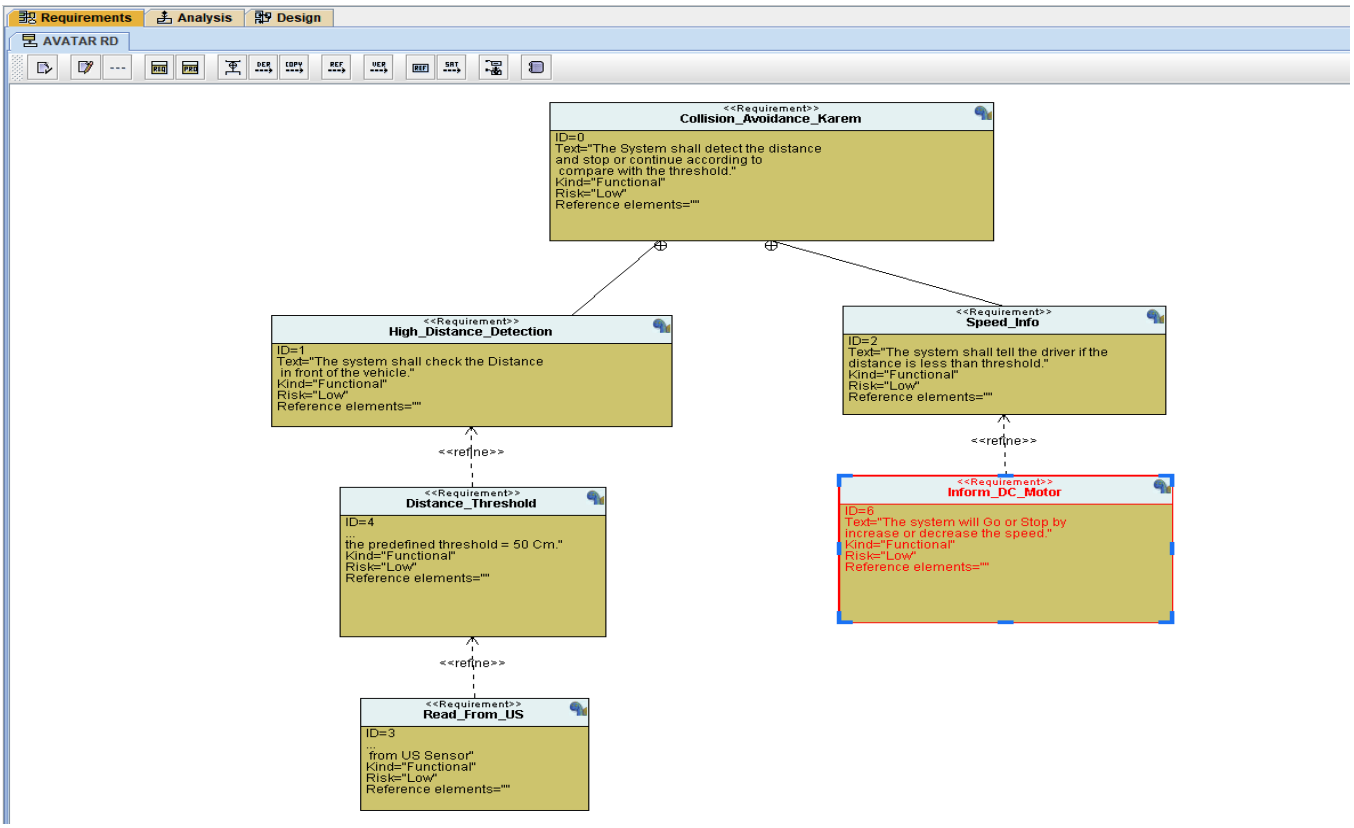
## About :

Collision Avoidance System detects the distance between the vehicle and objects in front of it .
Then it decide whether to stop or to continue according to compare with the threshold value .

## 2-Method

V-Model

## 3-Requirement Diagram

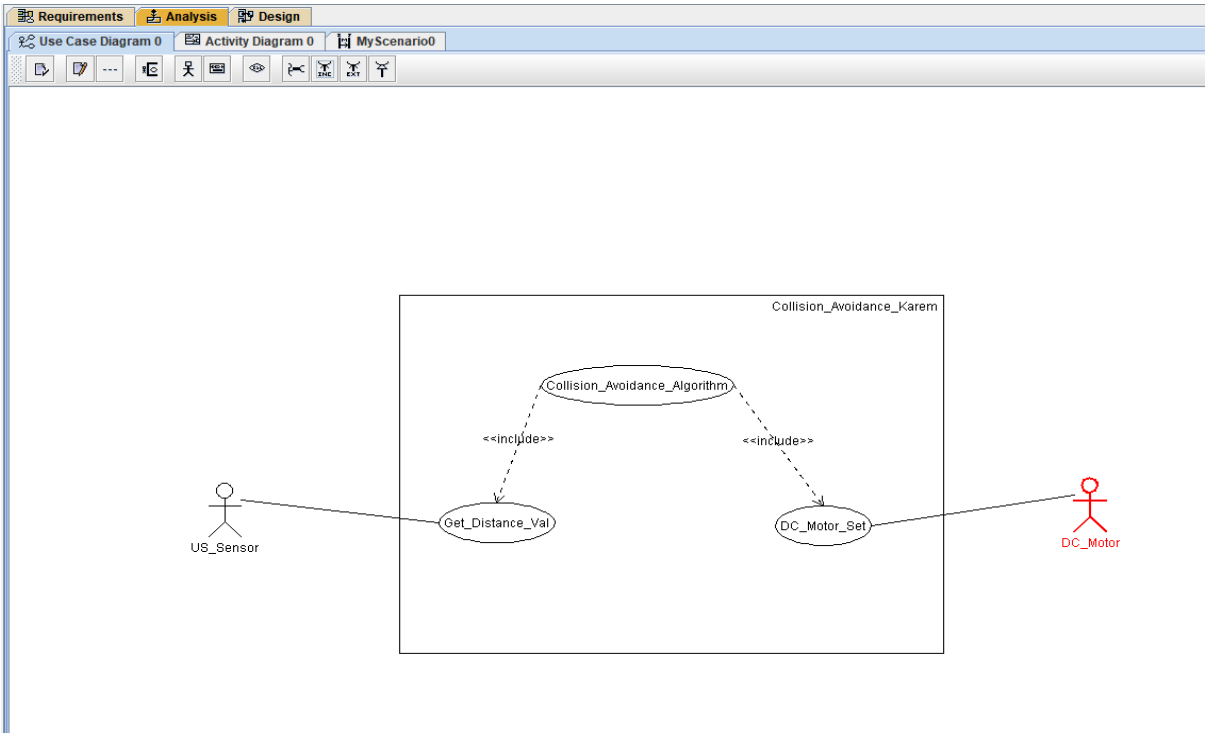


# 4-Space Exploration/Partitioning

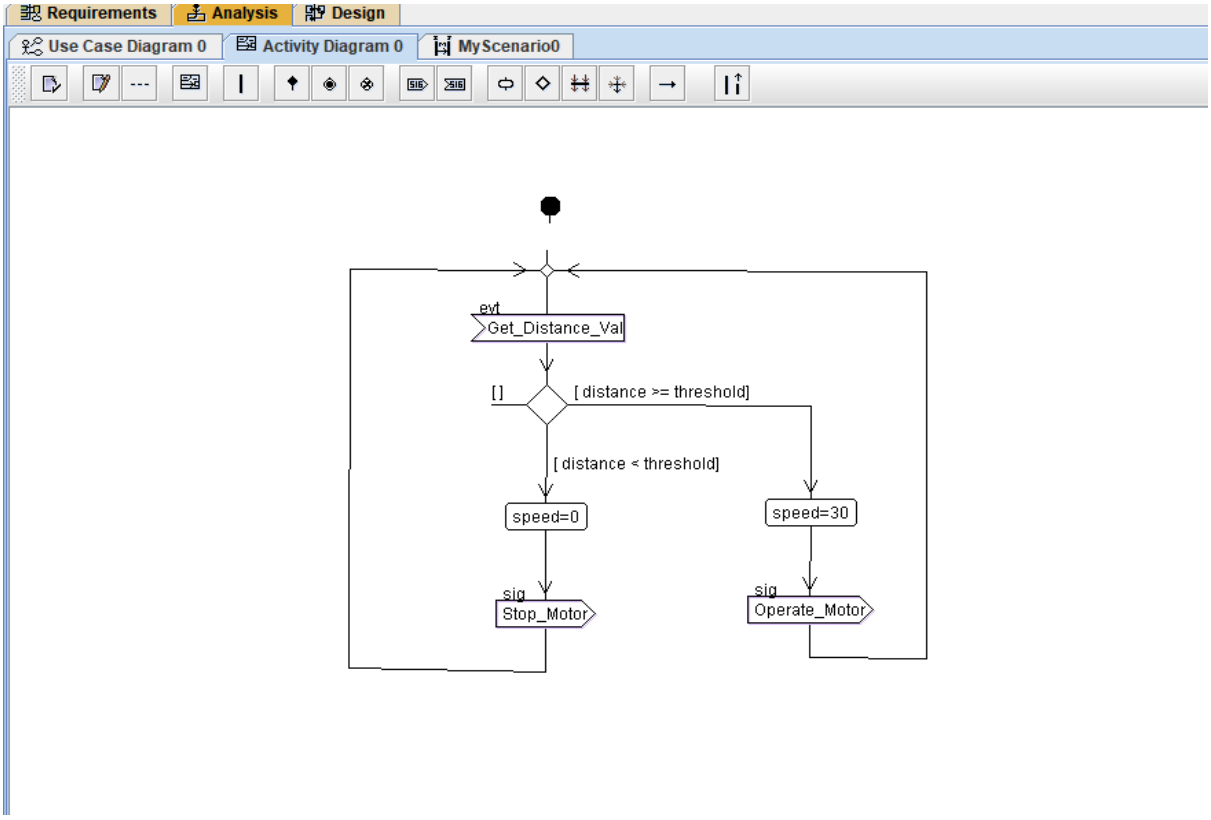
We will use STM32f103c6 for this project

# 5-System Analysis

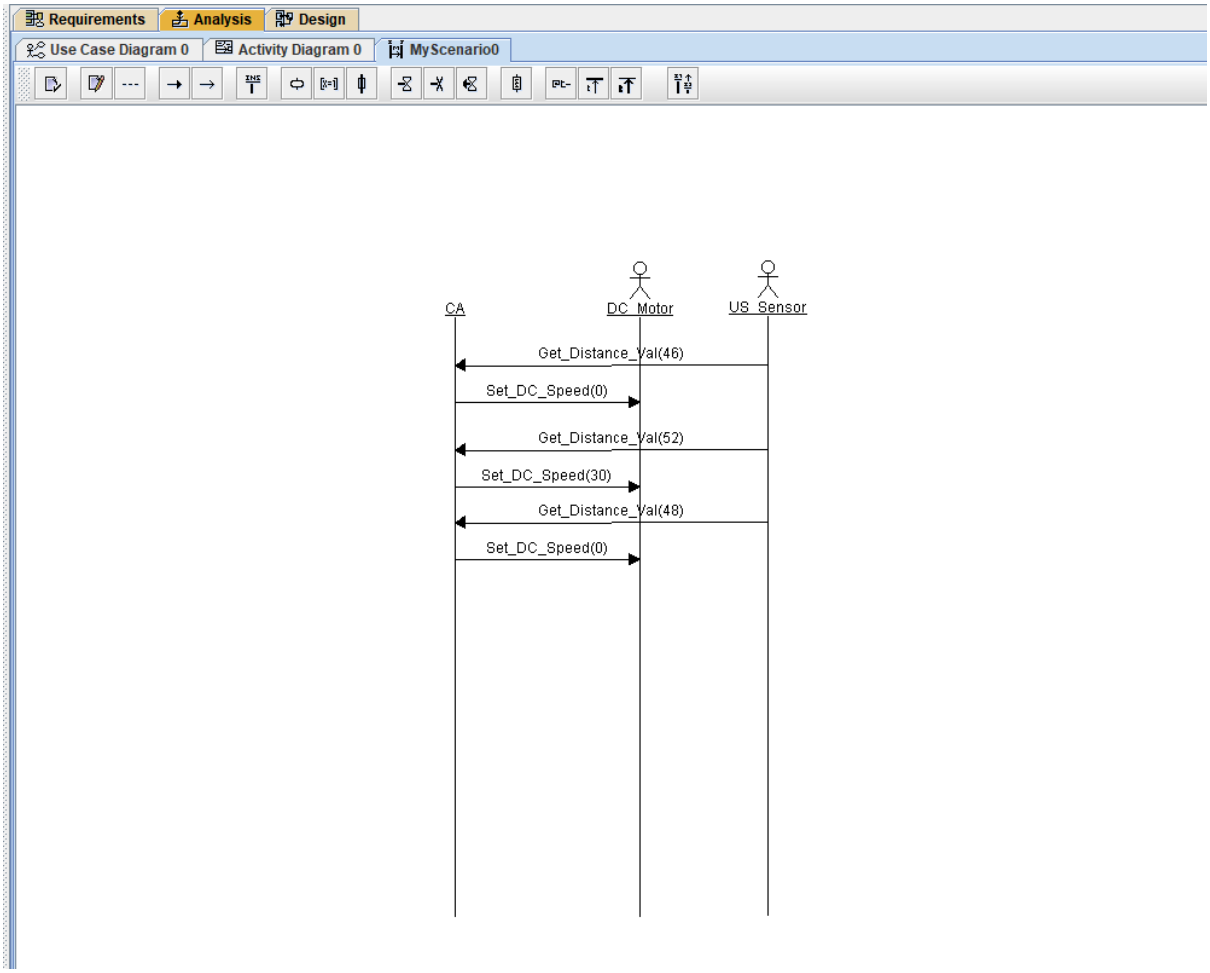
## 1)Use Case Diagram




## 2)Activity Diagram

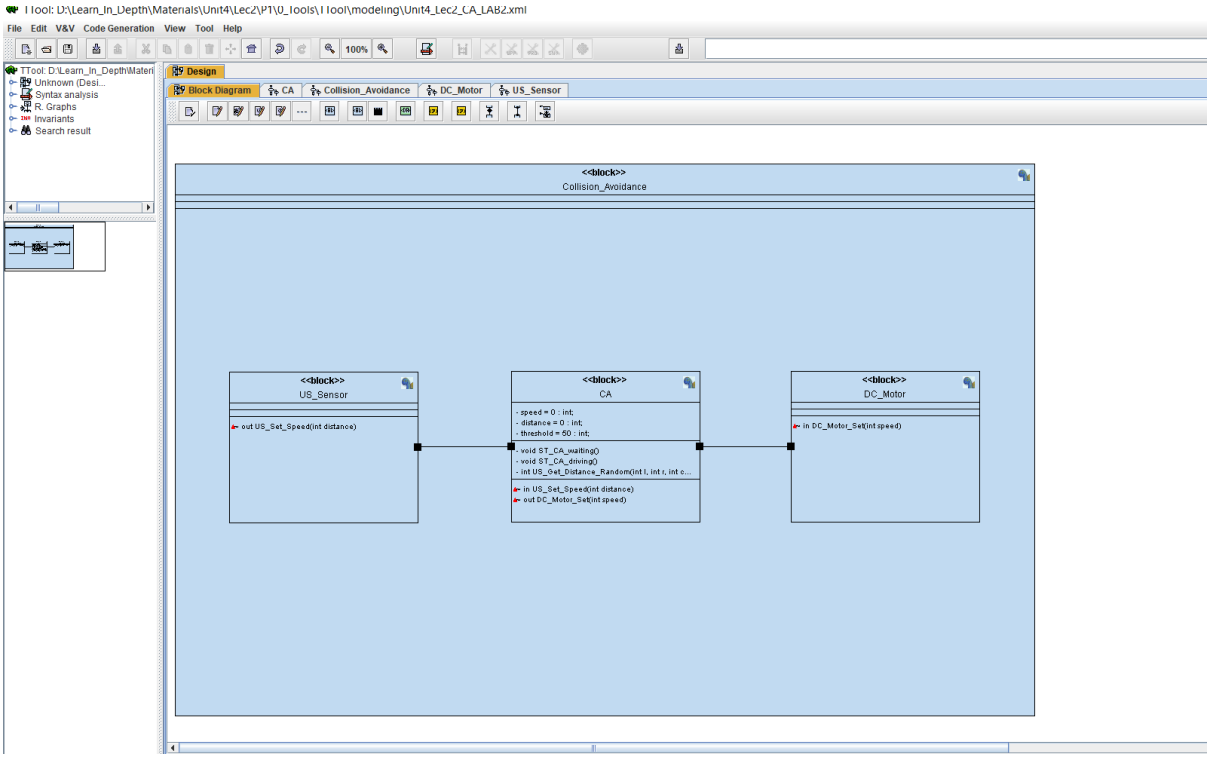


# 3)Sequence Diagram



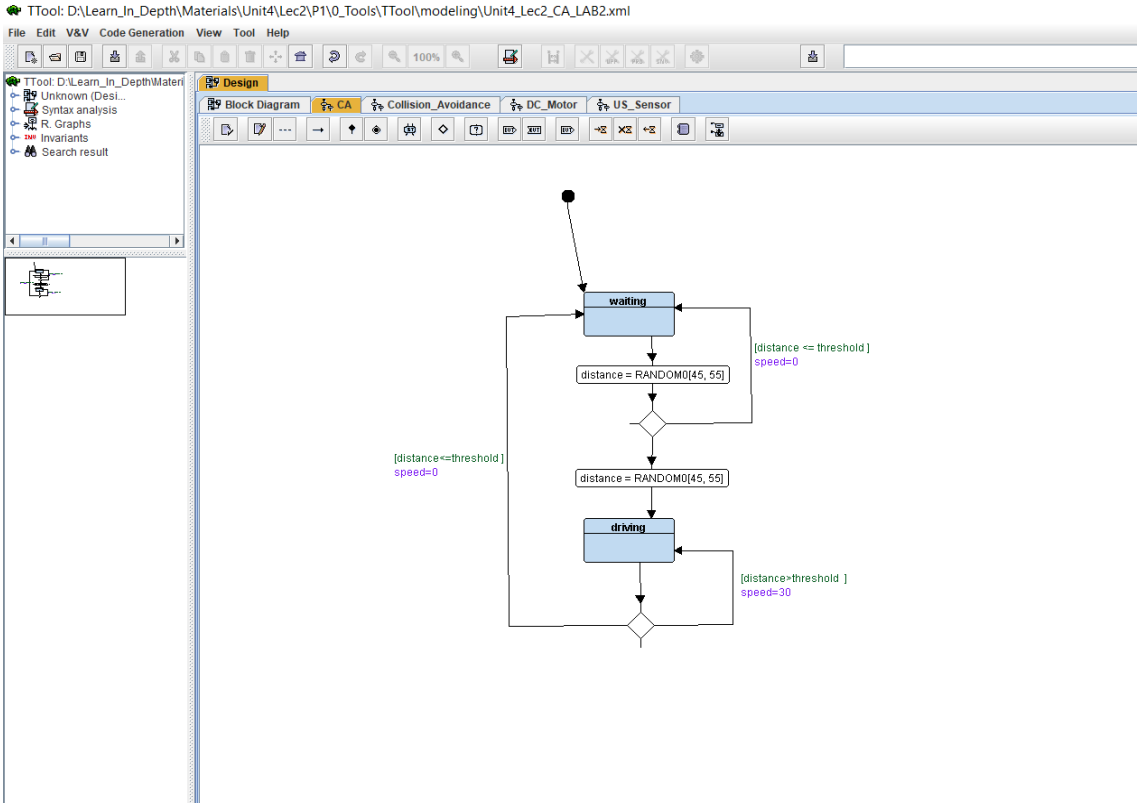
# 6-System Design

## 1)Project Block Diagram

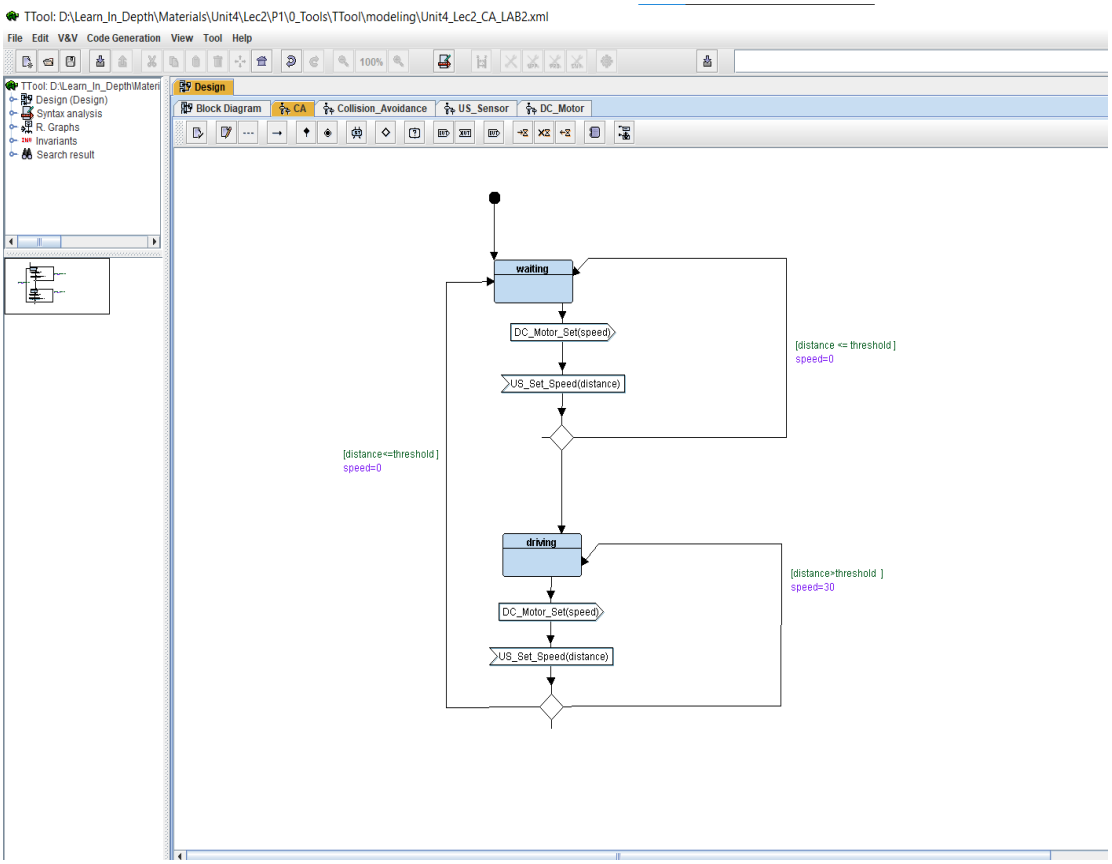



## 2)State Machine For each Module/Block

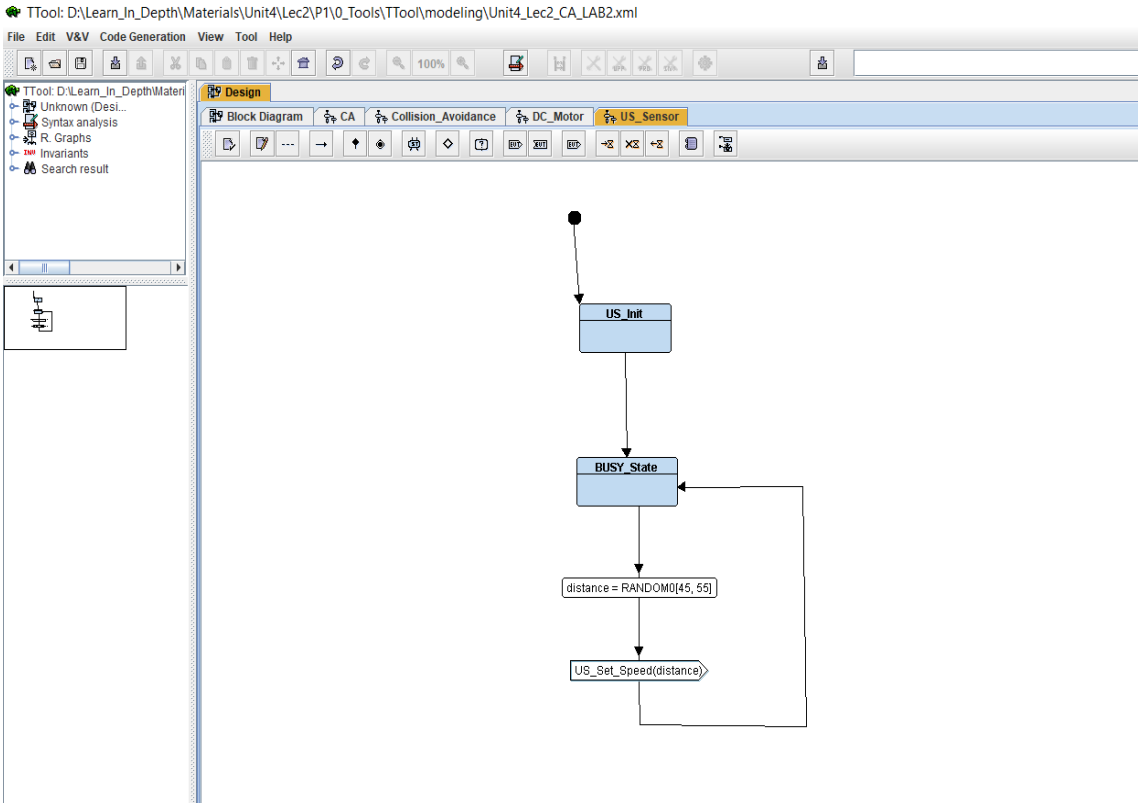
### 1-Collision Avoidance State Machine



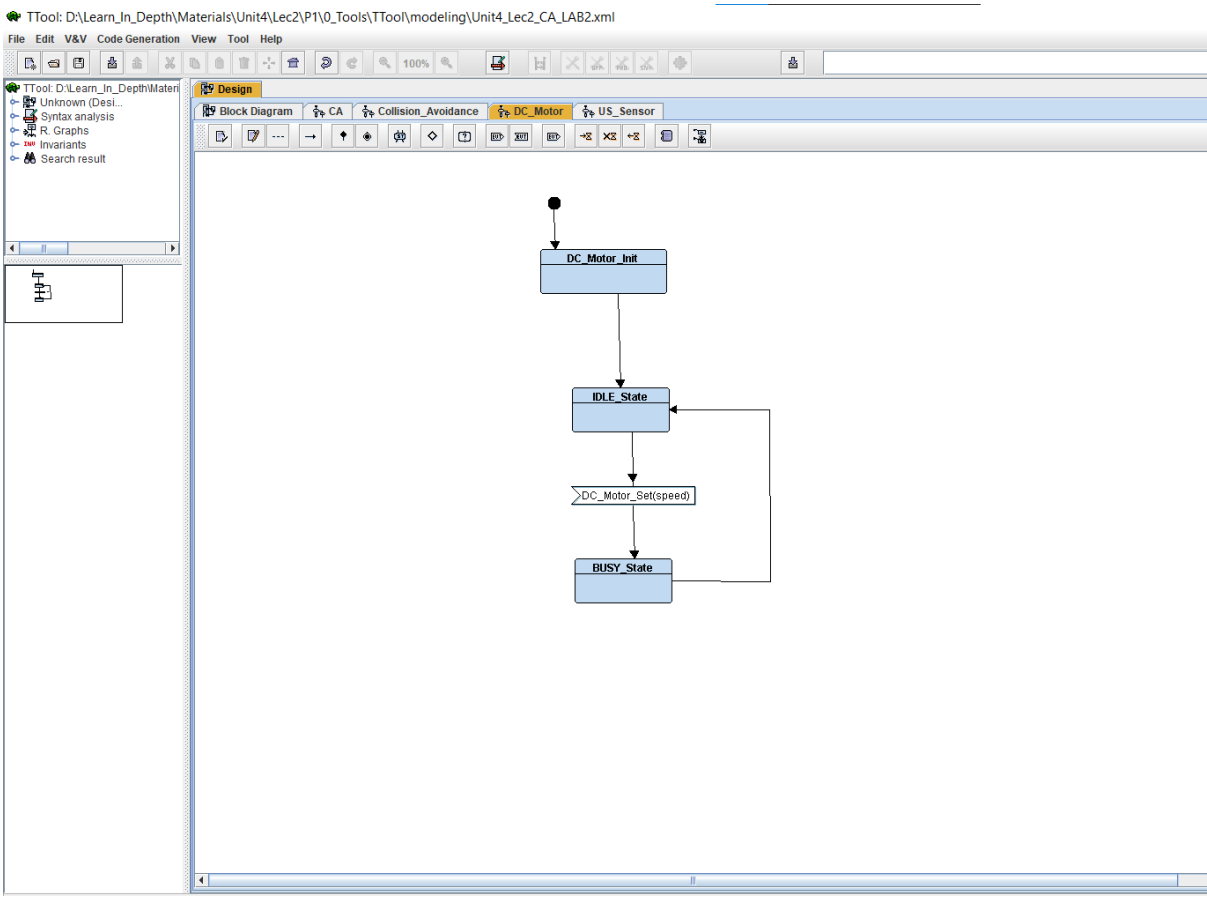
## -without Random



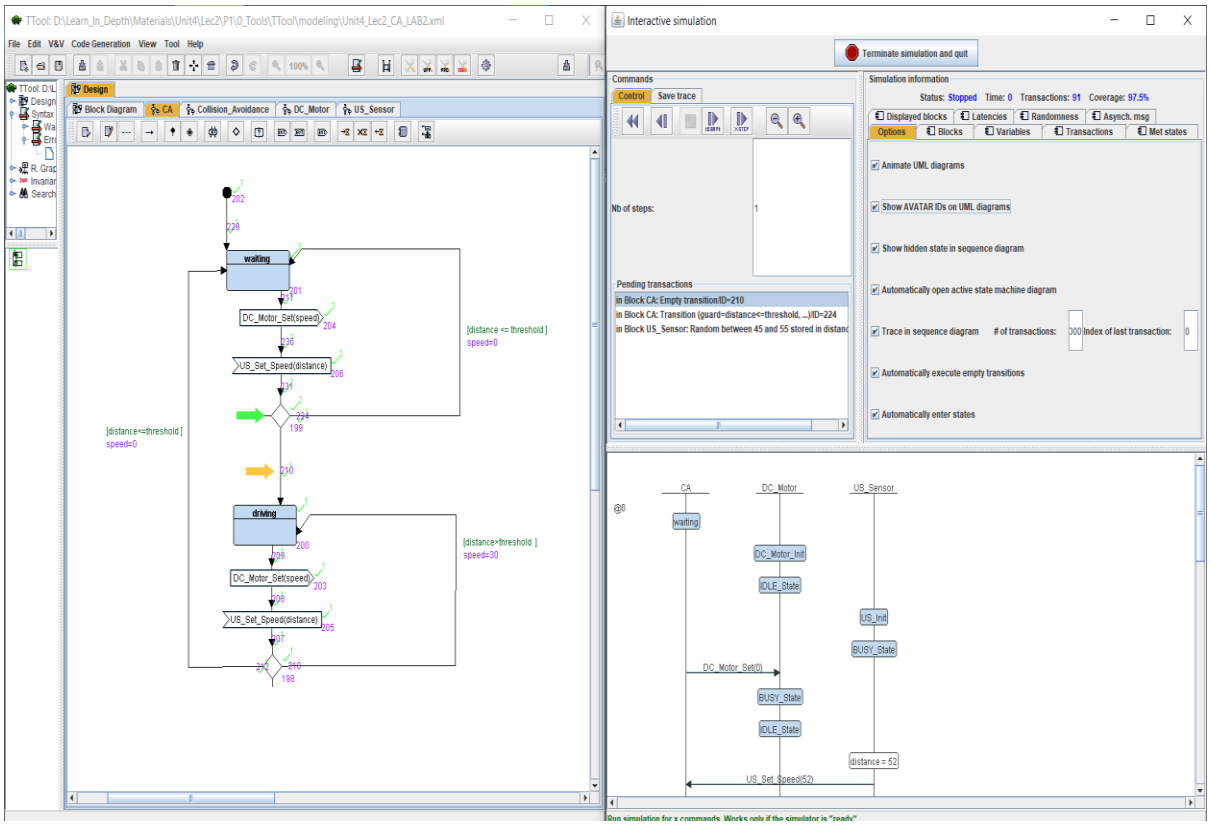

## 2-Ultrasonic Sensor State Machine

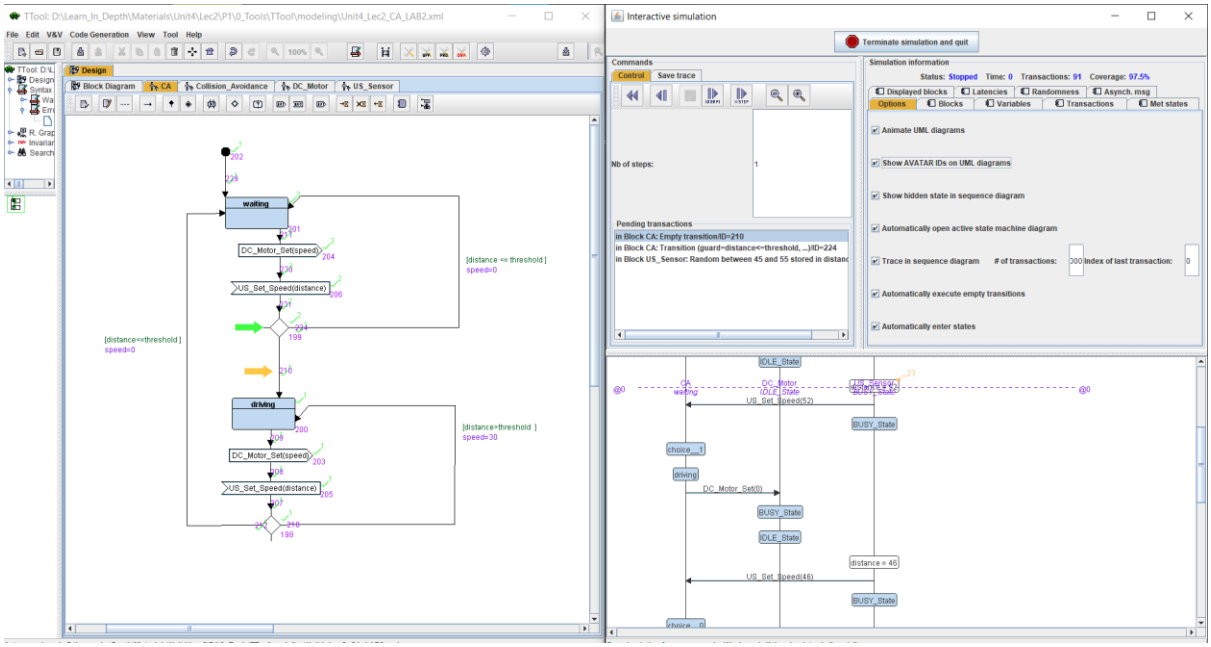


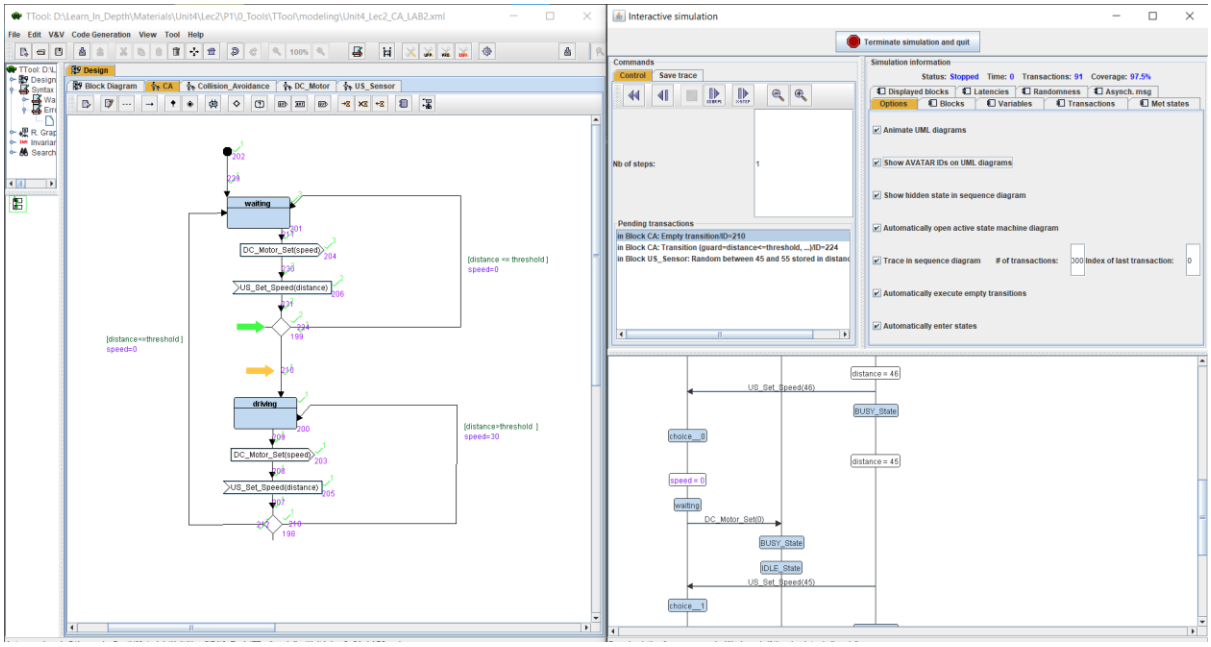
# 3-DC Motor State Machine




# Trace (Sequence Diagram)




Interactive simulation
Terminate simulation and quit
Commands
Control
Save trace
Simulation information
Status: Stopped Time: 0 Transactions: 91 Coverage: 97.5%
Displayed blocks
Latencies
Randomness
Asynch. msg
Options
Blocks
Variables
Transactions
Met states
Animate UML diagrams
Show AVATAR IDs on UML diagrams
Show hidden state in sequence diagram
Automatically open active state machine diagram
Trace in sequence diagram
# of transactions:
Index of last transaction:
Automatically execute empty transitions
Automatically enter states
Nb of steps:
Pending transactions
in Block CA: Empty transition/ID=210
in Block CA: Transition (guard=distance<=threshold, ...)/ID=224
in Block US_Sensor: Random between 45 and 55 stored in distanc
waiting
DC_Motor_Set(speed)
US_Set_Speed(distance)
driving
[distance <= threshold ]
speed=0
[distance>threshold ]
speed=30
IDLE_State
US_Set_Speed(52)
BUSY_State
choice__1
DC_Motor_Set(0)
distance = 46
US_Set_Speed(46)


Interactive simulation
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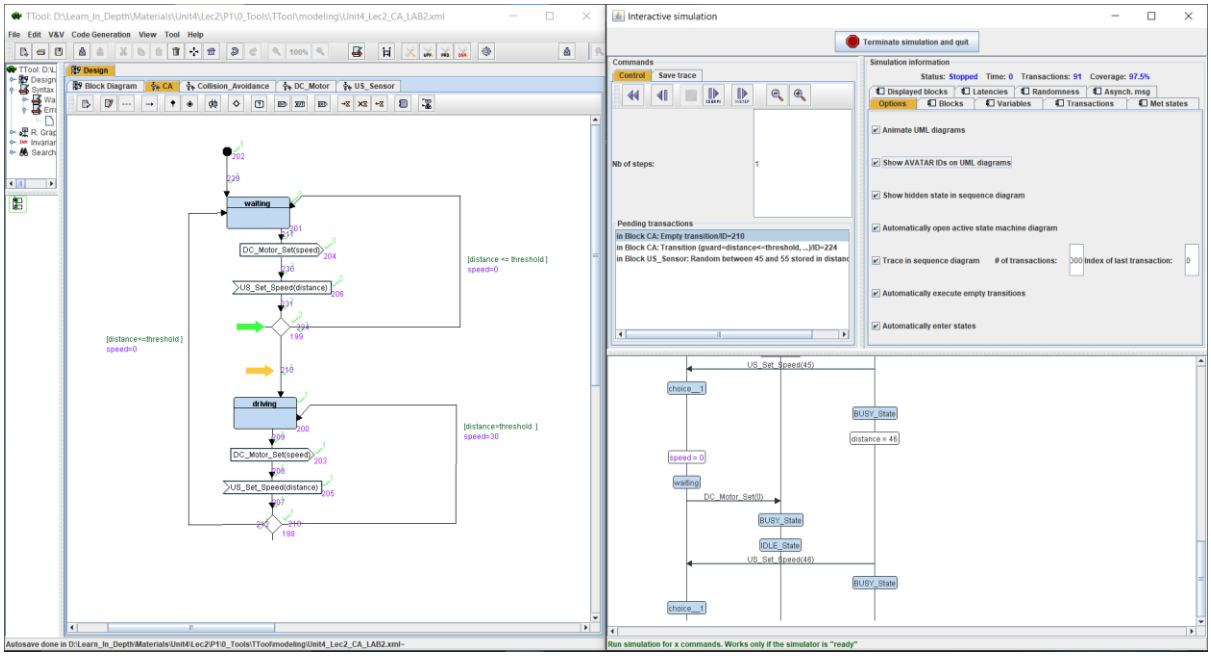
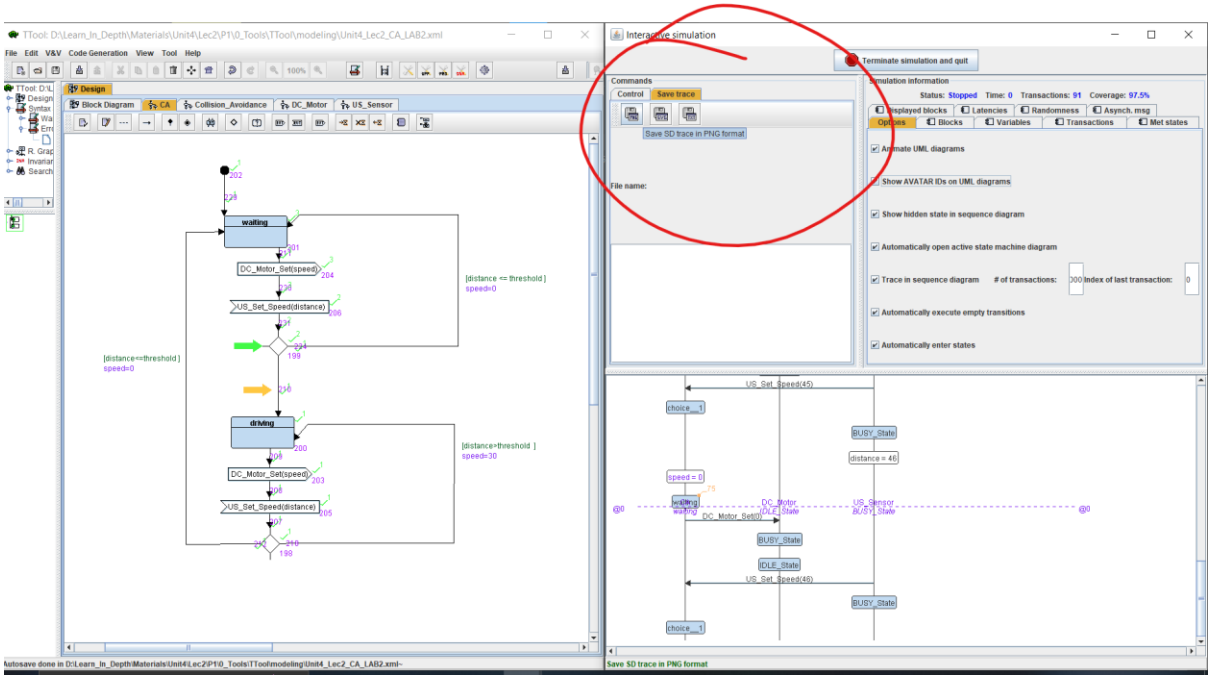
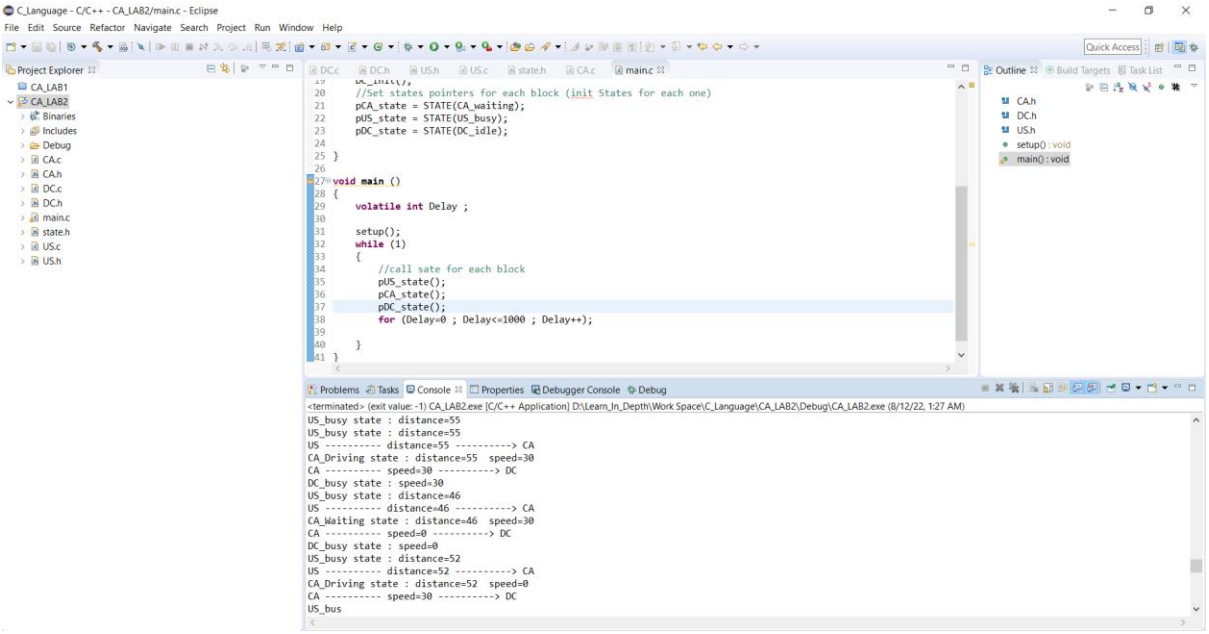
in Block CA: Transition (guard=distance<=threshold, ...)/ID=224
in Block US_Sensor: Random between 45 and 55 stored in distanc
waiting
DC_Motor_Set(speed)
US_Set_Speed(distance)
driving
[distance <= threshold ]
speed=0
[distance>threshold ]
speed=30
distance = 46
US_Set_Speed(46)
BUSY_State
choice__8
distance = 45
speed = 0
DC_Motor_Set(0)
IDLE_State
US_Set_Speed(45)
choice__1

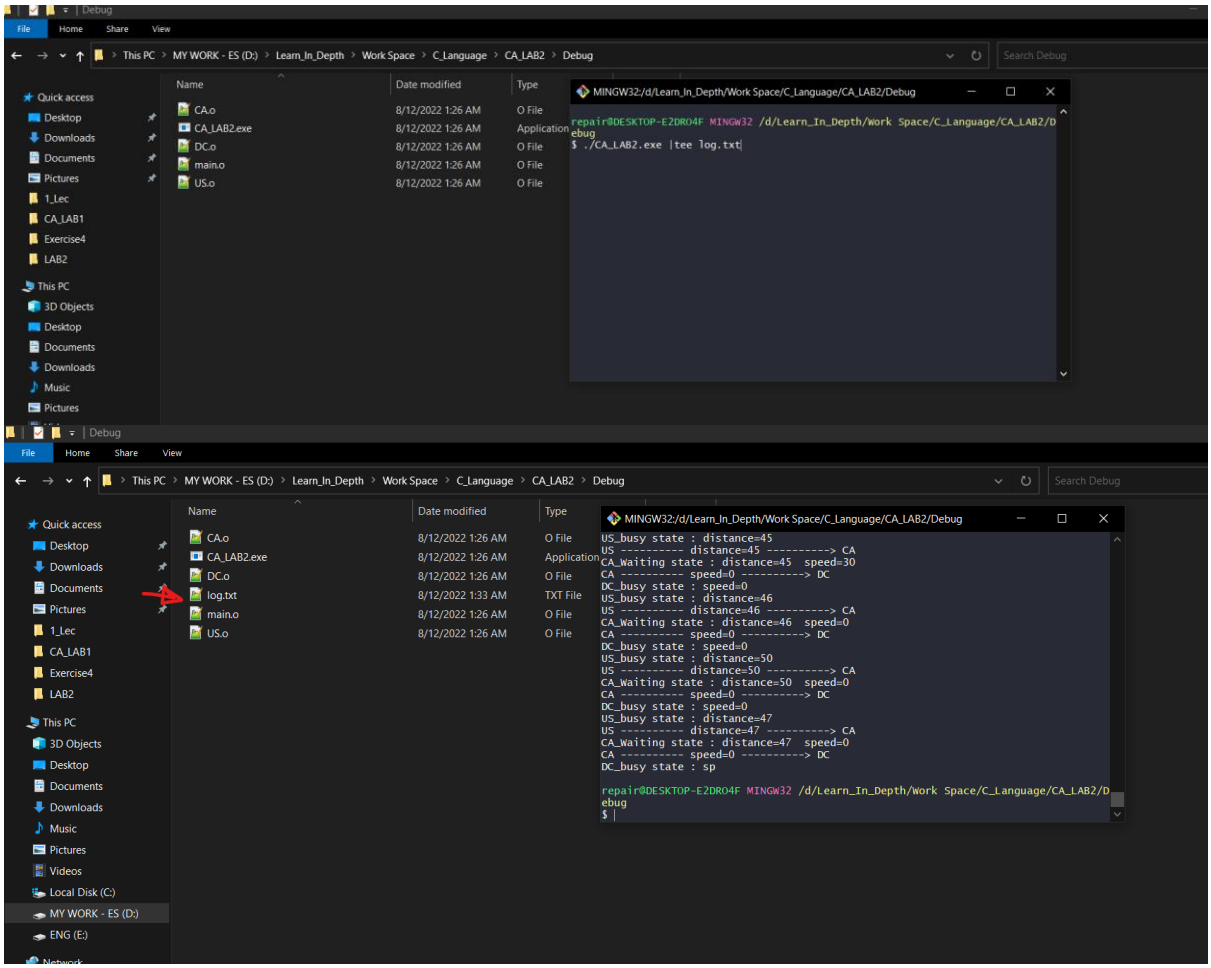


# Save as PNG



# RUN The Code:-




Save O/P as log.txt