

Sri Lanka Institute of Information Technology



Assignment 04

**Interactive 3D/VR/AR Application/Car exhibition based on Faculty of
Computing (FOC) main building premises**

IT4020 - Modern Topics in IT

Year 4, Semester 1

(2023) – Weekend Batch

Group Details

Group ID -> **MTIT-011**

Project Name -> **Interactive 3D/VR/AR Application/Car exhibition based on Faculty of Computing (FOC) main building premises**

Batch -> **2023 -Y4S1**

Registration Number	Student Name
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IT20178154	Dilshan P A D S D
IT20122782	Amani M P N
IT20081416	Ahamed M M Z

The Scenario

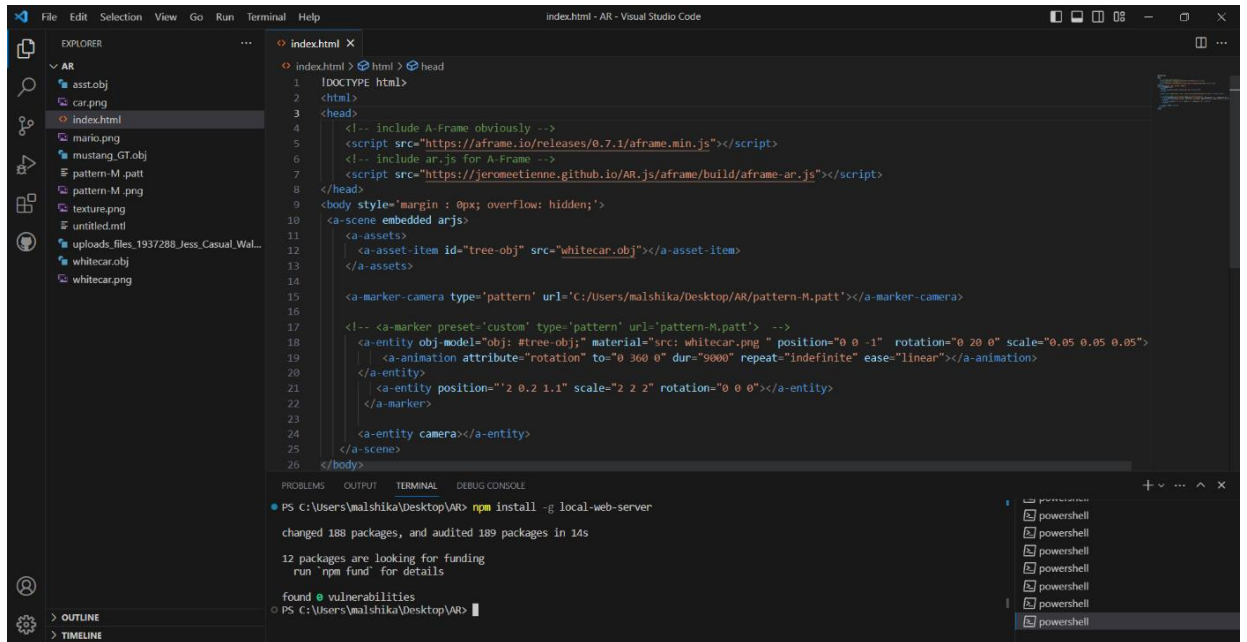
Certainly, here's a brief introduction to an AR application based on a **Car exhibition** in the virtual exhibition gallery of the SLIIT Malabe campus. The SLIIT Malabe campus is a hub of activity that provides students with a comprehensive learning experience. As part of this experience, the Faculty of Computing (FOC) main building premises offers an Island Area that is home to a variety of facilities and amenities, including an Open Space Virtual Exhibition Gallery. To enhance the experience of visitors to the exhibition gallery, an AR application has been developed that allows users to explore the gallery and interact with its exhibits in a virtual environment. The application features an accurate and well-detailed 3D model of the exhibition gallery, complete with interactive elements that users can explore.

One of the interactive elements of the application is a car exhibition located within the virtual exhibition gallery. The car exhibition features a range of vehicles, from vintage classics to modern supercars, each accompanied by detailed descriptions and specifications. Users can explore each car in detail using the AR application, viewing the cars from all angles and examining their features up close. Users can also interact with the cars in the exhibition by customizing their colors and features. For example, they can change the car's color, switch out the rims, and even adjust the suspension settings. This provides a fun and engaging way for users to personalize the cars and see how different customization options would look. This AR application provides an immersive and interactive way for users to explore the SLIIT Malabe campus and interact with the car exhibition within the virtual exhibition gallery. By offering a range of interactive features, the application provides a dynamic and engaging experience for users, helping to bring the exhibition to life in new and exciting ways.

Step 1

We need a secure server to host the app as it will access the camera of our mobile. Therefore, open the terminal and install the below local web server.

npm install -g local-web-server



The screenshot shows the Visual Studio Code interface. The Explorer panel on the left shows a file tree for a project named 'AR' with files like 'asst.obj', 'car.png', 'index.html', 'mario.png', 'mustang_GT.obj', 'pattern-M.patt', 'pattern-M.png', 'texture.png', 'untitled.mtl', 'uploads_files_1937288_Jess_Casual_Wal...', 'whitecar.obj', and 'whitecar.png'. The main editor displays the 'index.html' file with the following code:

```
1 <!DOCTYPE html>
2 <html>
3 <head>
4   <!-- include A-Frame obviously -->
5   <script src="https://aframe.io/releases/0.7.1/aframe.min.js"></script>
6   <!-- include ar.js for A-Frame -->
7   <script src="https://jeromeetienne.github.io/AR.js/aframe/build/aframe-ar.js"></script>
8 </head>
9 <body style="margin: 0px; overflow: hidden;">
10  <a-scene embedded arjs>
11    <a-assets>
12      <a-asset-item id="tree-obj" src="whitecar.obj"></a-asset-item>
13    </a-assets>
14
15    <a-marker-camera type="pattern" url="C:/Users/malshika/Desktop/AR/pattern-M.patt"></a-marker-camera>
16
17    <!-- <a-marker preset="custom" type="pattern" url="pattern-M.patt"> -->
18    <a-entity obj model="obj: #tree-obj;" material="src: whitecar.png" position="0 0 -1" rotation="0 20 0" scale="0.05 0.05 0.05">
19      <a-animation attribute="rotation" to="0 360 0" dur="9000" repeat="indefinite" ease="linear"></a-animation>
20    </a-entity>
21    <a-entity position="2 0.2 1.1" scale="2 2 2" rotation="0 0 0"></a-entity>
22  </a-marker>
23
24  <a-entity camera></a-entity>
25 </a-scene>
26 </body>
```

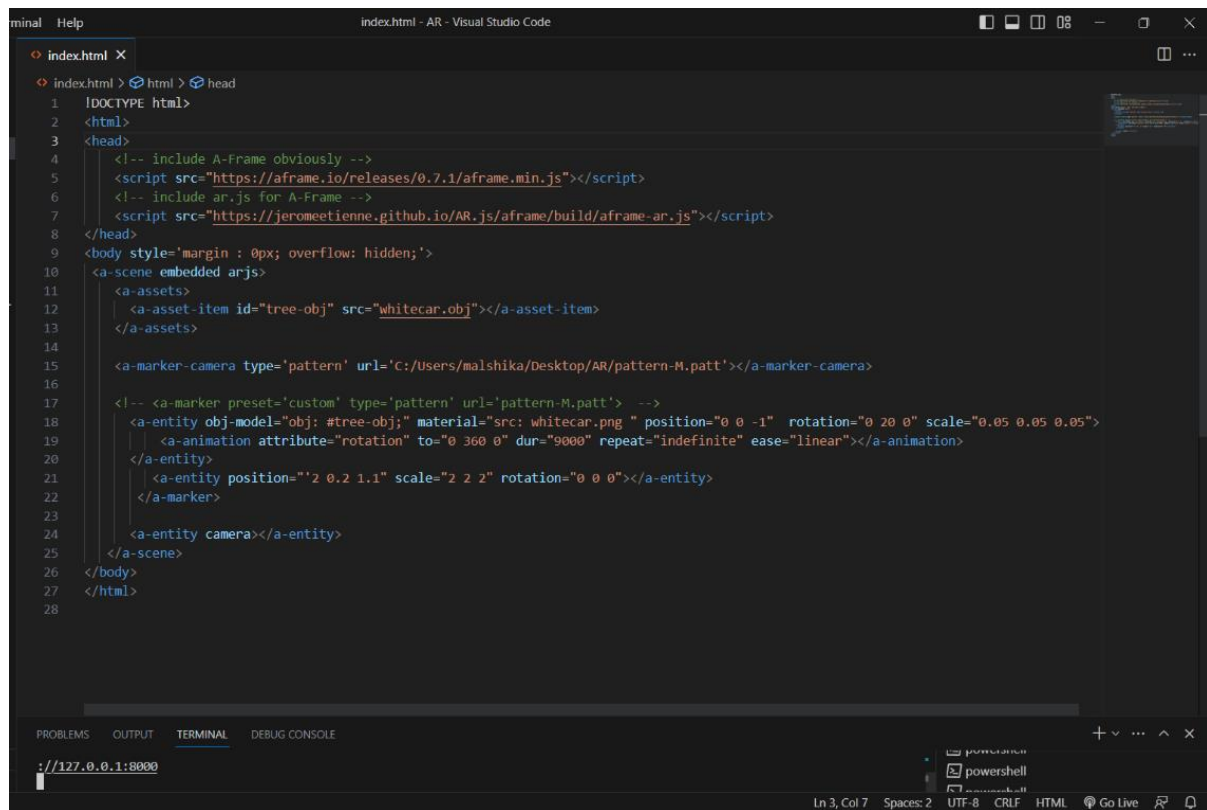
The bottom panel shows the 'TERMINAL' with the following output:

```
PS C:\Users\malshika\Desktop\AR> npm install -g local-web-server
changed 189 packages, and audited 189 packages in 14s
12 packages are looking for funding
run 'npm fund' for details
found 0 vulnerabilities
PS C:\Users\malshika\Desktop\AR>
```

Step 2

Create our AR application

- After the creation of the local server, create a new folder, which will be the AR project folder.
- Inside the AR project folder, create a text document in an HTML format.
- Name the text document as an Index.html



```
index.html - AR - Visual Studio Code
index.html X
index.html > html > head
1 |DOCTYPE html>
2 |<html>
3 |<head>
4 |  <!-- include A-Frame obviously -->
5 |  <script src="https://aframe.io/releases/0.7.1/aframe.min.js"></script>
6 |  <!-- include ar.js for A-Frame -->
7 |  <script src="https://jeromeetienne.github.io/AR.js/aframe/build/aframe-ar.js"></script>
8 |</head>
9 |<body style='margin : 0px; overflow: hidden;'>
10 |<a-scene embedded arjs>
11 |  <a-assets>
12 |    <a-asset-item id="tree-obj" src="whitecar.obj"></a-asset-item>
13 |  </a-assets>
14 |
15 |  <a-marker-camera type='pattern' url='C:/Users/malshika/Desktop/AR/pattern-M.patt'></a-marker-camera>
16 |
17 |  <!-- <a-marker preset='custom' type='pattern' url='pattern-M.patt' --> -->
18 |  <a-entity obj-model="obj: #tree-obj;" material="src: whitecar.png " position="0 0 -1" rotation="0 20 0" scale="0.05 0.05 0.05">
19 |    <a-animation attribute="rotation" to="0 360 0" dur="9000" repeat="indefinite" ease="linear"></a-animation>
20 |  </a-entity>
21 |  <a-entity position="'2 0.2 1.1" scale="2 2 2" rotation="0 0 0"></a-entity>
22 |  </a-marker>
23 |
24 |  <a-entity camera></a-entity>
25 |</a-scene>
26 |</body>
27 |</html>
28 |
PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE
: //127.0.0.1:8000
Ln 3, Col 7 Spaces 2 UTF-8 CRLF HTML Go Live
```

Step 3

Run a server

- Open the terminal via on AR project folder
- Run the local host server following the command

ws-https

```
1 <!DOCTYPE html>
2 <html>
3 <head>
4   <!-- include A-Frame obviously -->
5   <script src="https://aframe.io/releases/0.7.1/aframe.min.js"></script>
6   <!-- include ar.js for A-Frame -->
7   <script src="https://jeromeetienne.github.io/AR.js/aframe/build/aframe-ar.js"></script>
8 </head>
9 <body style="margin : 0px; overflow: hidden;">
10  <a-scene embedded arjs>
11    <a-assets>
12      <a-asset-item id="tree-obj" src="whitecar.obj"></a-asset-item>
13    </a-assets>
14    <a-marker-camera type="pattern" url="C:/Users/malshika/Desktop/AR/pattern-M.patt"></a-marker-camera>
15
16    <!-- <a-marker preset="custom" type="pattern" url="pattern-M.patt"> -->
17    <a-entity obj-model="obj: #tree-obj;" material="src: whitecar.png" position="0 0 -1" rotation="0 20 0" scale="0.05 0.05 0.05">
18      <a-animation attribute="rotation" to="0 360 0" dur="9000" repeat="indefinite" ease="linear"></a-animation>
19    </a-entity>
20    <a-entity position="2 0.2 1.1" scale="2 2 2" rotation="0 0 0"></a-entity>
21  </a-marker>
22
23  <a-entity camera></a-entity>
24 </a-scene>
25 </body>
```

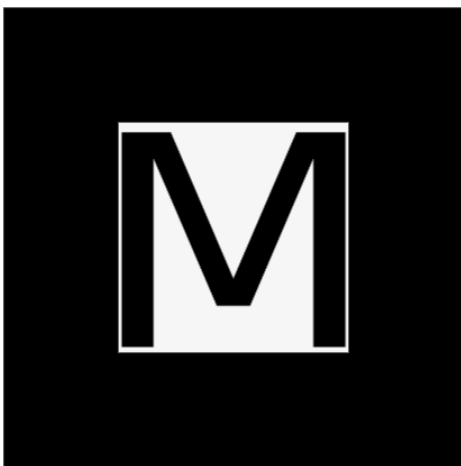
changed 188 packages, and audited 189 packages in 14s

12 packages are looking for funding
run `npm fund` for details

found 0 vulnerabilities

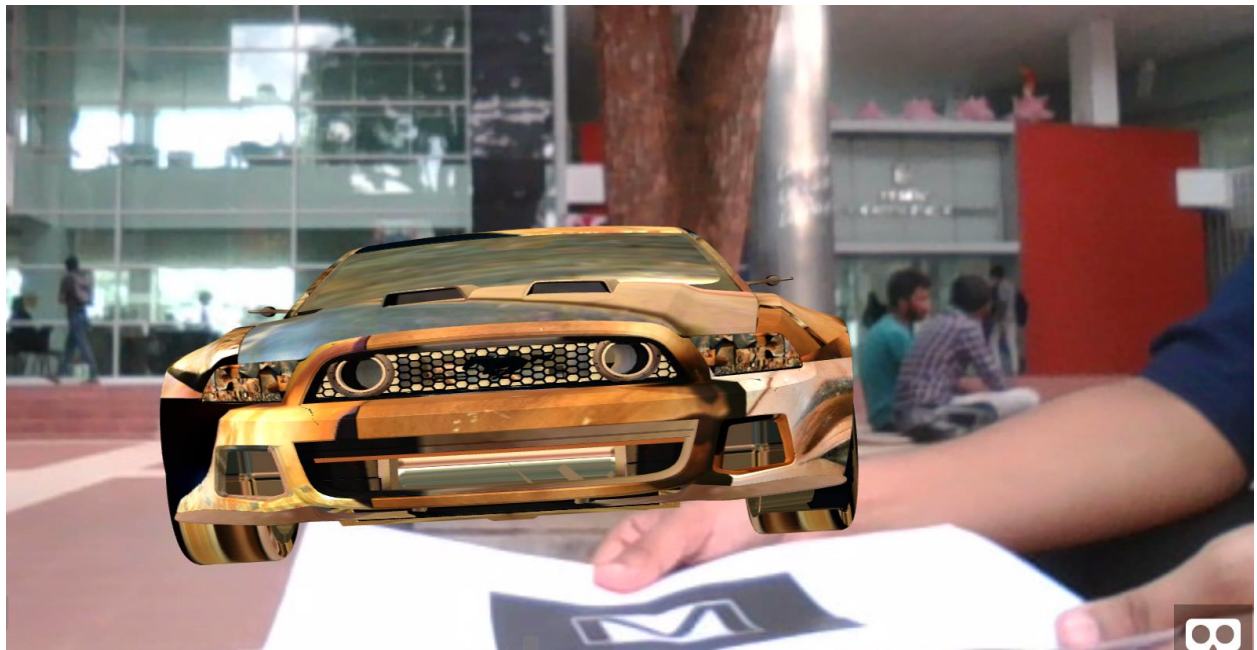
PS C:\Users\malshika\Desktop\AR> ws --https
Listening on https://DESKTOP-2R33114:8000, https://192.168.50.1:8000, https://10.0.1.1:8000, https://192.168.1.4:8000, https://127.0.0.1:8000

Marker



My name is Malshika .M represents my name. This is my own marker.

Output



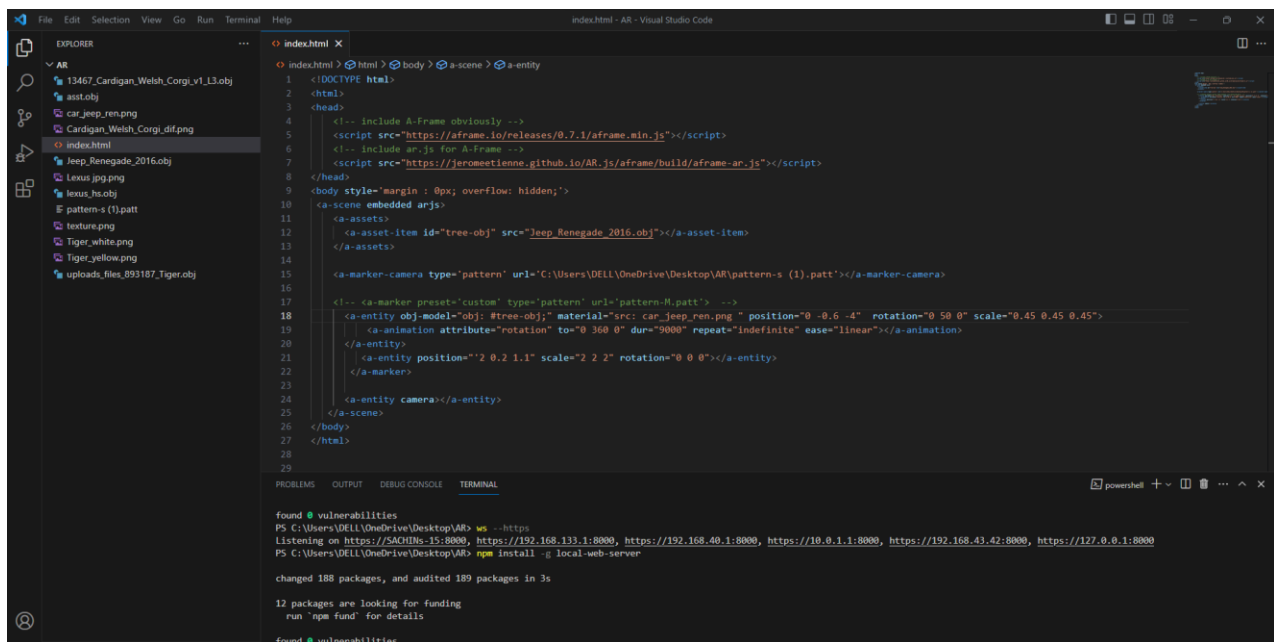
Drive Link

https://drive.google.com/file/d/1edc7edbSRnw6kIPdqMwZ_tyH7y1gUdRk/view?usp=sharing

Step 1

We need a secure server to host the app as it will access the camera of our mobile. Therefore, open the terminal and install the below local web server.

npm install -g local-web-server



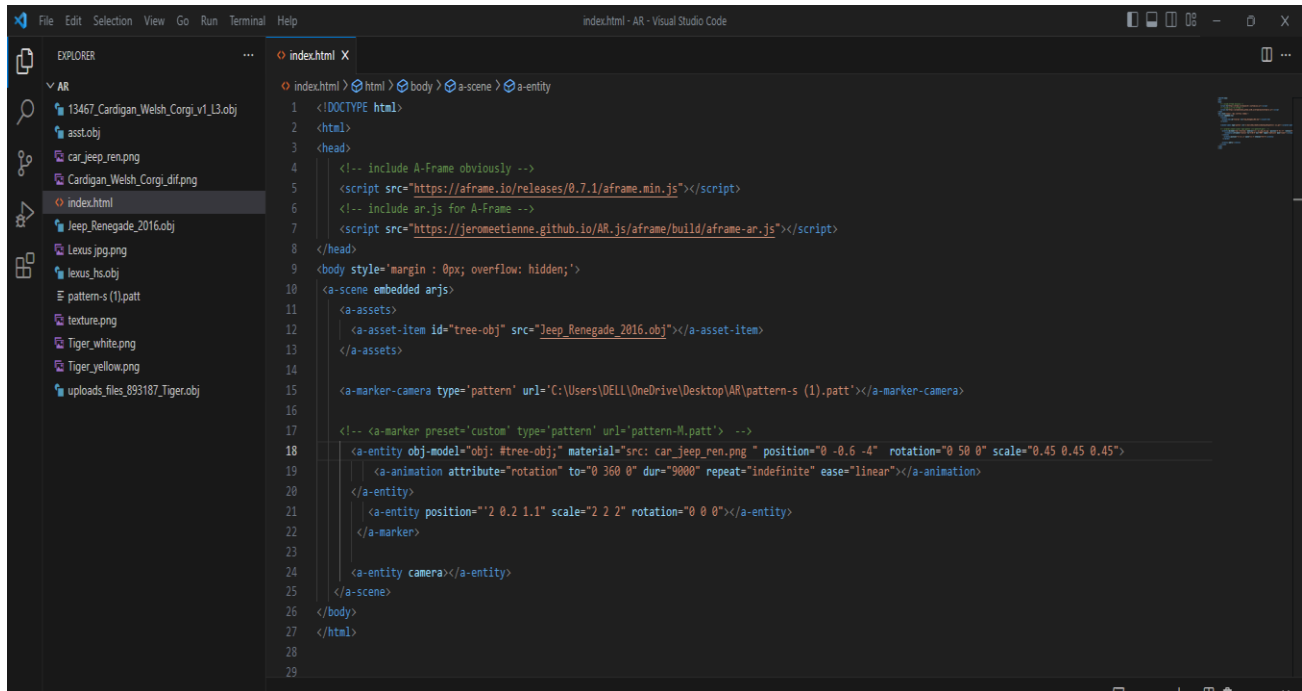
The screenshot shows the Visual Studio Code editor with a file explorer on the left containing various 3D model files like '13467_Cardigan_Welsh_Corgi_v1_L3.obj' and 'jeep_renegade_2016.obj'. The main editor displays the 'index.html' file, which is an AR application template using A-Frame. It includes scripts for A-Frame and AR.js, and defines a scene with a camera, a tree model, and a car model. The terminal at the bottom shows the command 'npm install -g local-web-server' being executed, with output indicating that 188 packages were changed and 189 packages were audited in 3 seconds.

```
index.html > html > body > a-scene > a-entity
1 <!DOCTYPE html>
2 <html>
3 <head>
4 <!-- include A-Frame obviously -->
5 <script src="https://aframe.io/releases/0.7.1/aframe.min.js"></script>
6 <!-- include ar.js for A-Frame -->
7 <script src="https://jeromeetienne.github.io/AR.js/aframe/build/aframe-ar.js"></script>
8 </head>
9 <body style="margin : 0px; overflow: hidden;">
10 <a-scene embedded arjs>
11 <a-assets>
12 <a-asset-item id="tree-obj" src="jeep_renegade_2016.obj"></a-asset-item>
13 </a-assets>
14
15 <a-marker-camera type="pattern" url="C:\Users\DELL\OneDrive\Desktop\AR\pattern-s (1).patt"></a-marker-camera>
16
17 <!-- a-marker preset: custom type: pattern url: pattern.H.patt -->
18 <a-entity obj-model="obj: #tree-obj;" material="src: car_jeep_ren.png" position="0 -0.6 -4" rotation="0 50 0" scale="0.45 0.45 0.45">
19 <a-animation attribute="rotation" to="0 360 0" dur="3000" repeat="indefinite" ease="linear"></a-animation>
20 </a-entity>
21 <a-entity position="2 0.2 1.1" scale="2 2 2" rotation="0 0 0"></a-entity>
22 </a-marker>
23
24 <a-entity camera></a-entity>
25 </a-scene>
26 </body>
27 </html>
28
29
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
found @ vulnerabilities
PS C:\Users\DELL\OneDrive\Desktop\AR> npm --https
Listening on https://5AC8B6:15-8000, https://192.168.133.1:8000, https://192.168.40.1:8000, https://10.0.1.1:8000, https://192.168.43.42:8000, https://127.0.0.1:8000
PS C:\Users\DELL\OneDrive\Desktop\AR> npm install -g local-web-server
changed 188 packages, and audited 189 packages in 3s
12 packages are looking for funding
run 'npm fund' for details
found @ vulnerabilities
```

Step 2

Create our AR application.

- After the creation of the local server, create a new folder, which will be the AR project folder.
- Inside the AR project folder, create a text document in an HTML format.
- Name the text document as an Index.html

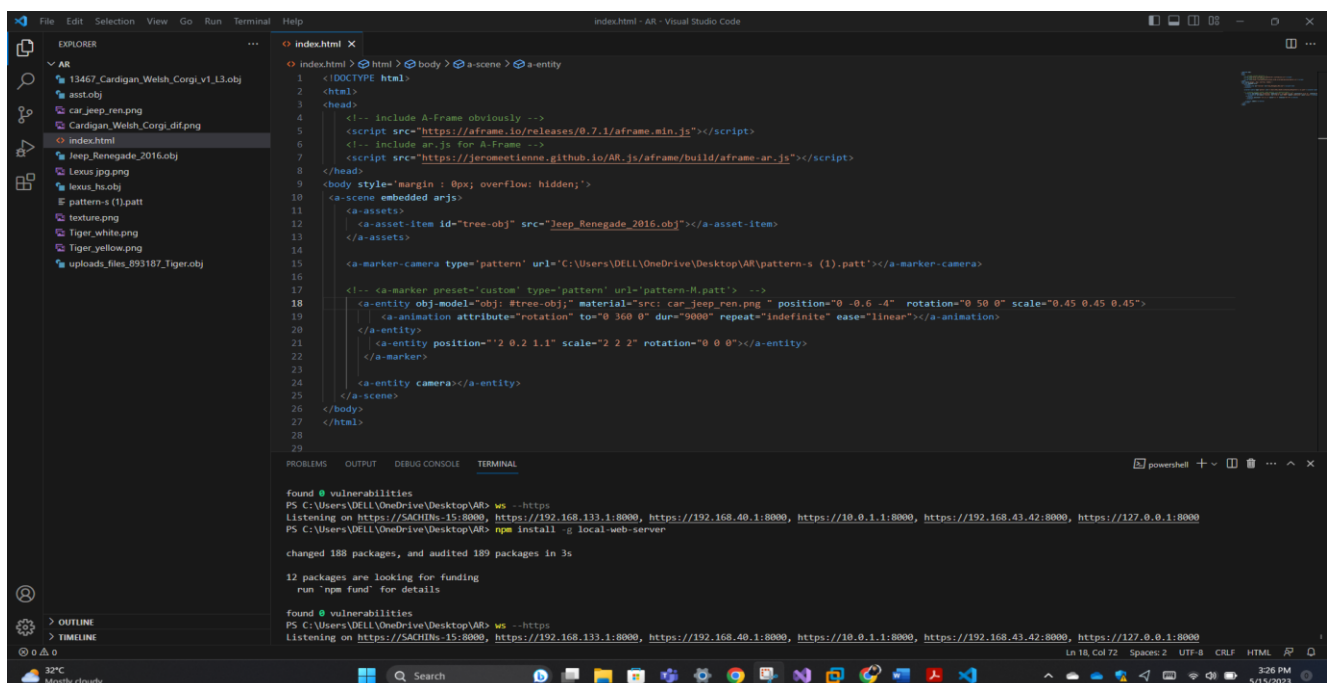


Step 3

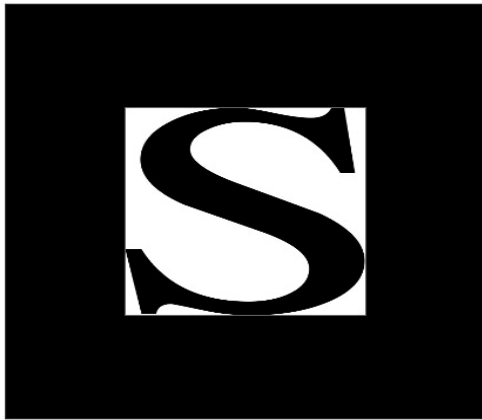
Run a server.

- Open the terminal via on AR project folder
- Run the local host server following the command

ws –https



Marker



My name is Sachin .S represents my name. This is my own marker.

Output





Drive Link

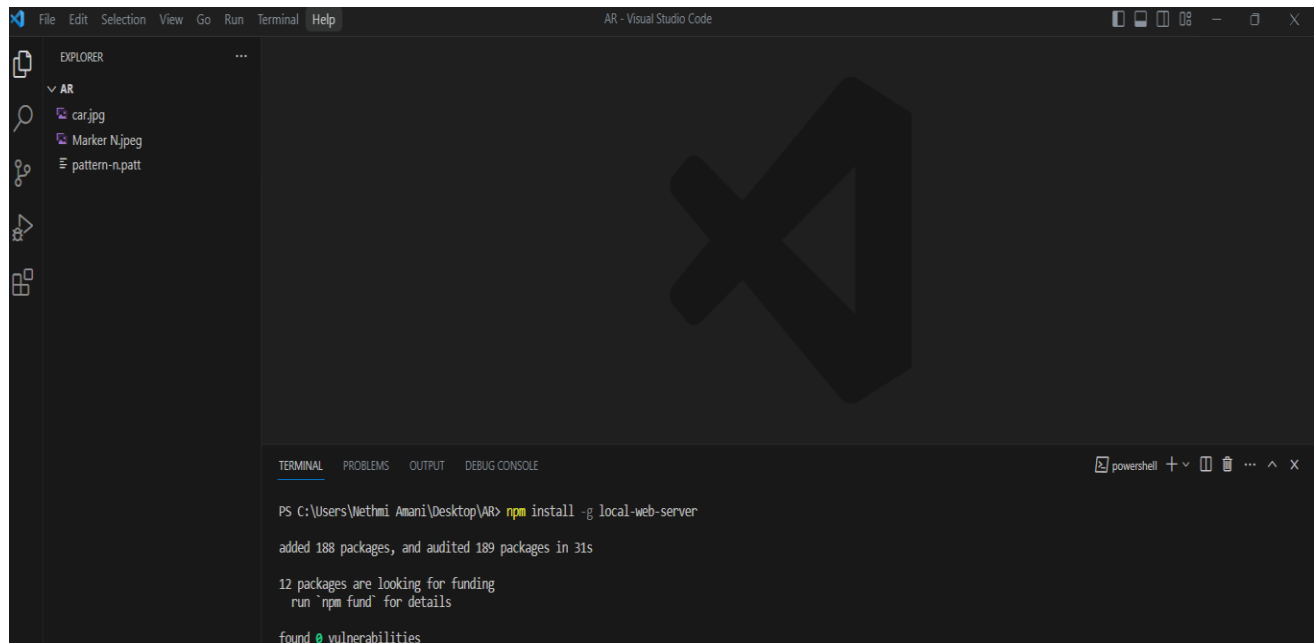
https://drive.google.com/drive/folders/19_blkHuy95Tgmy_j_DV6b-lyjIR9gQ1m?usp=sharing

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Step 1

We need a secure server to host the app as it will access the camera of our mobile. Therefore, open the terminal and install the below local web server.

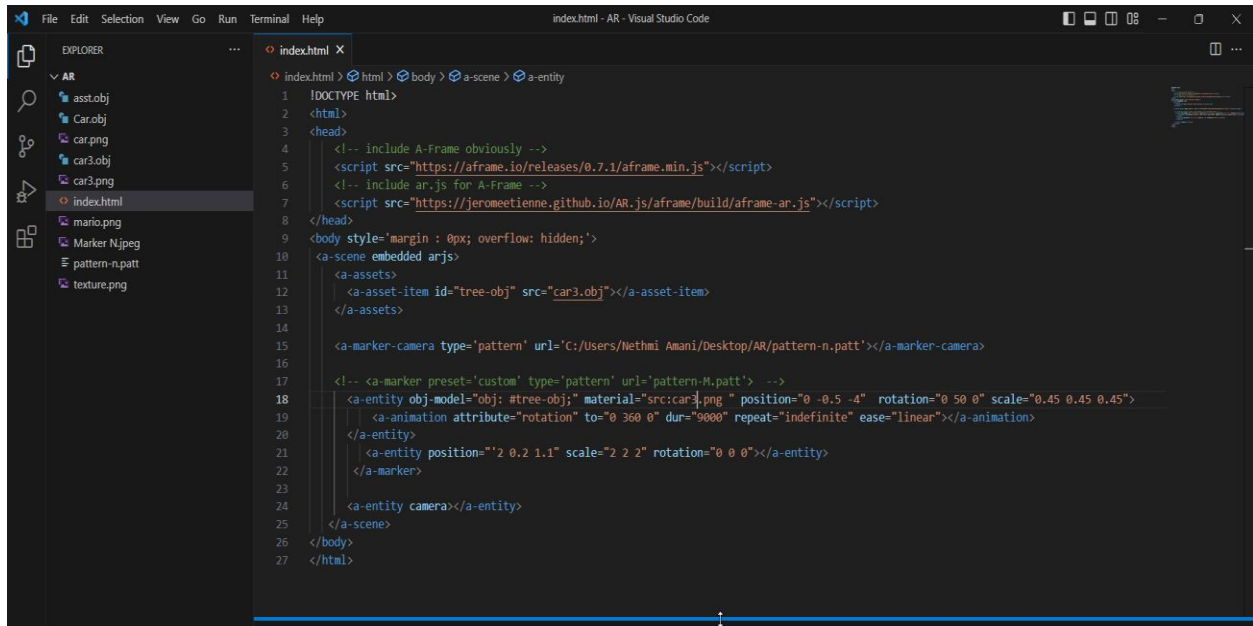
npm install -g local-webserver.



Step 2

Create our AR application.

- After the creation of the local server, create a new folder, which will be the AR project folder.
- Inside the AR project folder, create a text document in an HTML format.
- Name the text document as an Index.html

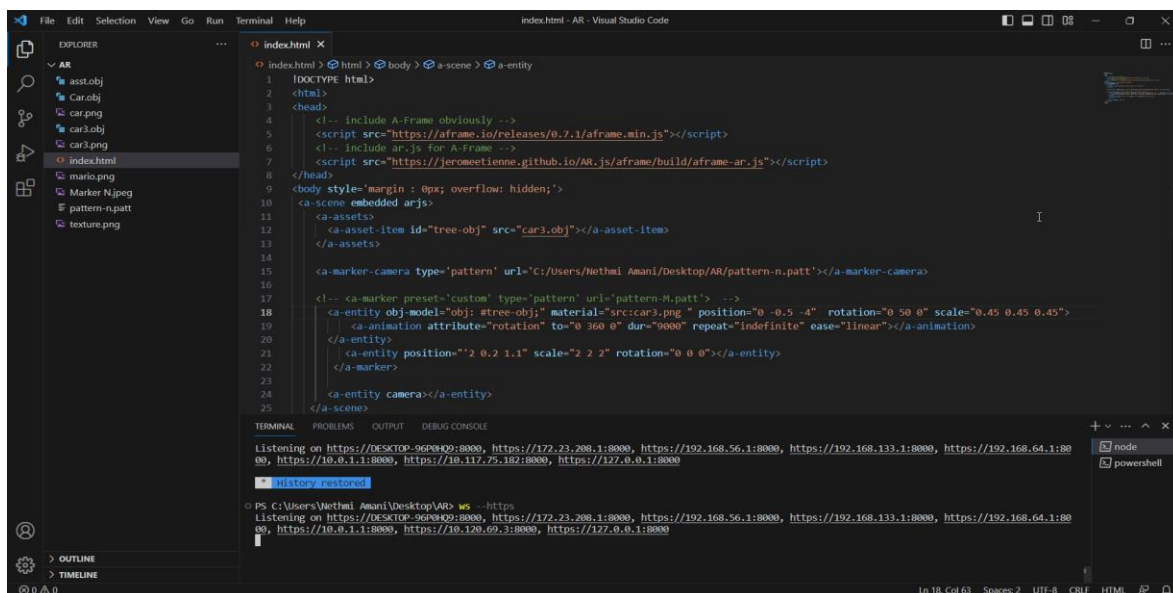


Step 3

Run a server.

- Open the terminal via on AR project folder
- Run the local host server following the command

ws -https



Marker



My name is Nethmi .N represents my name. This is my own marker.

Output





Drive Link

<https://drive.google.com/file/d/10oma7LeyR80tMs8knuijD0KK9CqzMDodG/view?usp=sharing>

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Ahamed M M Z

Step 1

We need a secure server to host the app as it will access the camera of our mobile. Therefore, open the terminal and install the below local web server.

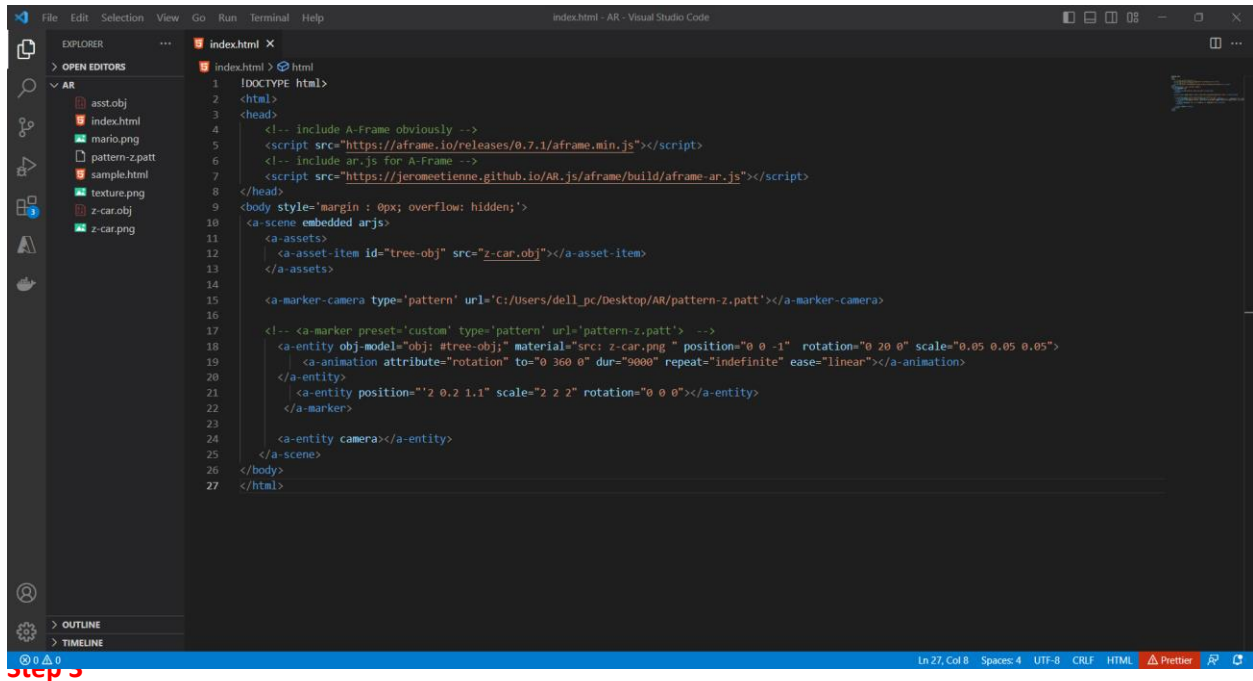
npm install -g local-webserver.

```
PS C:\Users\dell_pc\Desktop\VAR> npm install -g local-web-server
C:\Users\dell_pc\AppData\Roaming\npm\ws -> C:\Users\dell_pc\AppData\Roaming\npm\node_modules\local-web-server\bin\cli.mjs
+ local-web-server@5.3.0
added 1 package from 1 contributor and updated 3 packages in 37.702s
PS C:\Users\dell_pc\Desktop\VAR>
```

Step 2

Create our AR application.

- After the creation of the local server, create a new folder, which will be the AR project folder.
- Inside the AR project folder, create a text document in an HTML format.
- Name the text document as an Index.html



```
1 <!DOCTYPE html>
2 <html>
3 <head>
4   <!-- include A-Frame obviously -->
5   <script src="https://aframe.io/releases/0.7.1/aframe.min.js"></script>
6   <!-- include ar.js for A-Frame -->
7   <script src="https://jeromeetienne.github.io/AR.js/aframe/build/aframe-ar.js"></script>
8 </head>
9 <body style="margin : 0px; overflow: hidden;">
10  <a-scene embedded ar.js>
11    <a-assets>
12      <a-asset-item id="tree-obj" src="z-car.obj"></a-asset-item>
13    </a-assets>
14
15    <a-marker-camera type="pattern" url="C:/Users/dell_pc/Desktop/AR/pattern-z.patt"></a-marker-camera>
16
17    <!-- <a-marker preset="custom" type="pattern" url="pattern-z.patt"> -->
18    <a-entity obj-model="obj; #tree-obj;" material="src: z-car.png" position="0 0 -1" rotation="0 20 0" scale="0.05 0.05 0.05">
19      <a-animation attribute="rotation" to="0 360 0" dur="9000" repeat="indefinite" ease="linear"></a-animation>
20    </a-entity>
21    <a-entity position="2 0.2 1.1" scale="2 2 2" rotation="0 0 0"></a-entity>
22  </a-marker>
23
24  <a-entity camera></a-entity>
25 </a-scene>
26 </body>
27 </html>
```

Run a server.

- Open the terminal via on AR project folder
- Run the local host server following the command

ws -https


```
1 <!DOCTYPE html>
2 <html>
3 <head>
4   <!-- include A-Frame obviously -->
5   <script src="https://aframe.io/releases/0.7.1/aframe.min.js"></script>
6   <!-- include ar.js for A-Frame -->
7   <script src="https://jeromeetienne.github.io/AR.js/aframe/build/aframe-ar.js"></script>
8 </head>
9 <body style="margin : 0px; overflow: hidden;">
10  <a-scene embedded arjs>
11    <a-assets>
12      <a-asset-item id="tree-obj" src="z-car.obj"></a-asset-item>
13    </a-assets>
14
15    <a-marker-camera type="pattern" url="C:/Users/dell_pc/Desktop/AR/pattern-z.patt"></a-marker-camera>
16
17    <!-- <a-marker preset="custom" type="pattern" url="pattern-z.patt"> -->
18    <a-entity obj-model="obj: #tree-obj;" material="src: z-car.png" position="0 0 -1" rotation="0 20 0" scale="0.05 0.05 0.05">
19      <a-animation attribute="rotation" to="0 360 0" dur="9000" repeat="indefinite" ease="linear"></a-animation>
20    </a-entity>
21    <a-entity position="2 0.2 1.1" scale="2 2 2" rotation="0 0 0"></a-entity>
22  </a-marker>
23
24  <a-entity camera="z-car.obj"></a-entity>
25 </a-scene>
```

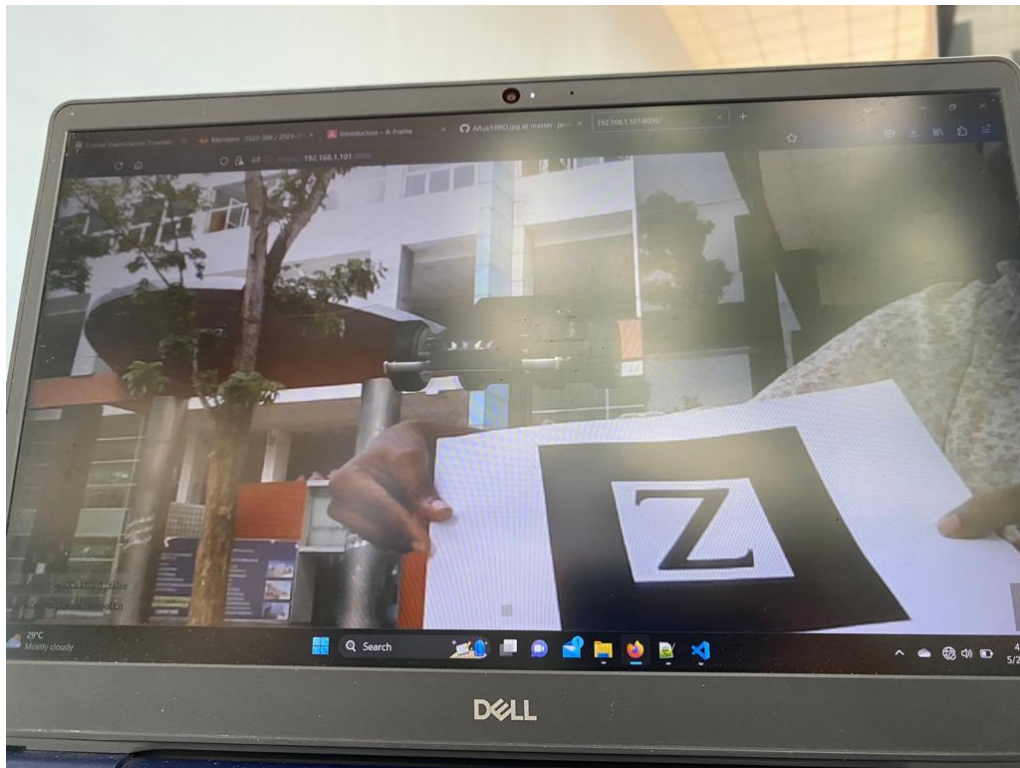
PS C:\Users\dell_pc\Desktop\AR> node -https
• listening on https://Zaid:8000, https://192.168.109.1:8000, https://192.168.16.1:8000, https://10.0.1.1:8000, https://192.168.1.100:8000, https://127.0.0.1:8000

Marker



My name is Zaid .Z represents my name. This is my own marker.

Output



Drive Link

<https://drive.google.com/file/d/1NdIkSjupx1X0Sbe8XP2uO4Y3Eqz0dTxy/view?usp=sharing>