WRAPPING UP AR

What is our GOAL for this MODULE?

We revised the Augmented reality(AR) concepts learned and applied them to generate QR Code for the hosted GitHub project link and create an Augmented reality portfolio with pattern markers

What did we ACHIEVE in the class TODAY?

- We revised the Augmented reality(AR) concepts
- We learned to create an Augmented reality portfolio with pattern markers

Which CONCEPTS/CODING BLOCKS did we cover today?

- <a-entity>,<a-camera> etc
- aframe markers

How did we DO the activities?

1. Concepts we revised:

   Web-based AR Framework:

   - A-Frame is a framework to create Web-Based Augmented Reality scenes.
   - A-Frame HTML & JavaScript-based framework.
   - Source: https://aframe.io/

   Web-based AR Library:

   - A-Frame has arjs component which is built over the JavaScript library,
   - AR.js, for web-based, Augmented reality.

   Creating an AR scene :<a-scene embedded arjs>

   The arjs component is attached to the scene to make an augmented reality scene.

```
<!DOCTYPE html>
<html>

<head>
  <meta charset="utf-8" />
  <meta http-equiv="X-UA-Compatible" content="IE=edge" />


  <!-- Import A-Frame and then AR.js -->
  <script src="https://aframe.io/releases/1.0.4/aframe.min.js"></script>

  <script src="https://jeromeetienne.github.io/AR.js/aframe/build/aframe-ar.js"></script>

</head>

<body style="margin : 0px; overflow: hidden;">

  <!-- A-frame scene -->
  <a-scene vr-mode-ui="enabled: false;"
    embedded
    arjs="trackingMethod: best; sourceType: webcam;debugUIEnabled: false;">




  </a-scene>

</body>
</html>
```

Marker-based AR: <a-marker>

Hiro & Kanji Markers	Barcode Markers	Pattern Markers
Standard markers	Special markers with unique values.	Custom markers
	Barcode marker with value 5	

Hiro & Kanji Markers

- <a-marker-camera preset='hiro'></a-marker-camera>

```html
<body style="margin : 0px; overflow: hidden;">

  <!-- A-frame scene -->
  <a-scene vr-mode-ui="enabled: false;"
    embedded
    arjs="trackingMethod: best; sourceType: webcam;debugUIEnabled: false;">


    <!-- Define a camera which will move according to the marker position -->
    <a-marker-camera preset='hiro'>


    </a-marker-camera>

  </a-scene>

</body>
</html>
```

Barcode Markers

- <a-scene arjs='detectionMode: mono_and_matrix; matrixCodeType: 3x3;'></a-scene>
- <a-marker-camera type='barcode' value='5'></a-marker-camera>

```html
<!-- A-frame scene -->
<a-scene vr-mode-ui="enabled: false;"
  embedded
  arjs="detectionMode: mono_and_matrix; matrixCodeType: 3x3;">

  <a-marker-camera type='barcode' value='5'>


  </a-marker-camera>

</a-scene>
```

Pattern Markers

- <a-marker-camera type='pattern' url='pathToMarker.patt'> </a-marker-camera>

```
<!-- A-frame scene -->
<a-scene vr-mode-ui="enabled: false;"
  embedded
  arjs="trackingMethod: best; sourceType: webcam; debugUIEnabled: false;">

  <a-marker-camera type='pattern' url='path/to/pattern-marker.patt'>


  </a-marker-camera>

</a-scene>
```

Markerless-AR

- Web-based Location-based AR: Based on the GPS installed in the devices.

  A-Frame AR.js aframe-ar-nft.js library

  - arjs component
  - gps-entity-place component
  - gps-camera component

  A-Frame aframe-look-at-component.js library:

  - look-at component

```
<script src="https://aframe.io/releases/1.0.4/aframe.min.js"></script>
<script src="https://unpkg.com/aframe-look-at-component@0.8.0/dist/aframe-look-at-component.min.js"></script>
<script src="https://raw.githack.com/AR-js-org/AR.js/master/aframe/build/aframe-ar-nft.js"></script>
</head>

<body style="margin: 0; overflow: hidden;">
  <a-scene vr-mode-ui="enabled: false" embedded arjs="sourceType: webcam; debugUIEnabled: false;">

    <a-assets>
      <a-asset-item id="ballModel" src="./ball/scene.gltf">
      </a-asset-item>
    </a-assets>

    <!--NOTE: REPLACE LOCATION POINTS WITH YOUR CURRENT LOCATION-->
    <a-entity gltf-model="#ballModel" look-at="[gps-camera]" scale="1 1 1" position="0 0 0" rotation="0 0 -10"
      gps-entity-place="latitude: 22.7868542 ; longitude: 88.3643296;"></a-entity>

    <a-camera gps-camera rotation-reader minDistance="1" positionMinAccuracy="0"> </a-camera>

</a-scene>
```

- Mobile-based Face Recognition App: Based on the FaceDetector module from Expo React

Image Tracking:

- NFT Based image tracking markers.
- Image tracking is a technique that allows to detect/track 2D images by collecting image data.
- Once the image is detected the augmented reality can scan the image and the render objects over that.

2. Setup the basic A-Frame AR scene.

```html
<!DOCTYPE html>
<html>

<head>
  <meta charset="utf-8" />
  <meta http-equiv="X-UA-Compatible" content="IE=edge" />
  <title>Marker based AR Portfolio</title>

  <!-- Import A-Frame and then AR.js -->
  <script src="https://aframe.io/releases/1.0.4/aframe.min.js"></script>

  <script src="https://jeromeetienne.github.io/AR.js/aframe/build/aframe-ar.js"></script>

</head>

<body style="margin : 0px; overflow: hidden;">

  <!-- A-frame scene -->
  <a-scene vr-mode-ui="enabled: false;" embedded
    arjs="trackingMethod: best; sourceType: webcam;debugUIEnabled: false;">



  </a-scene>
</body>

</html>
```
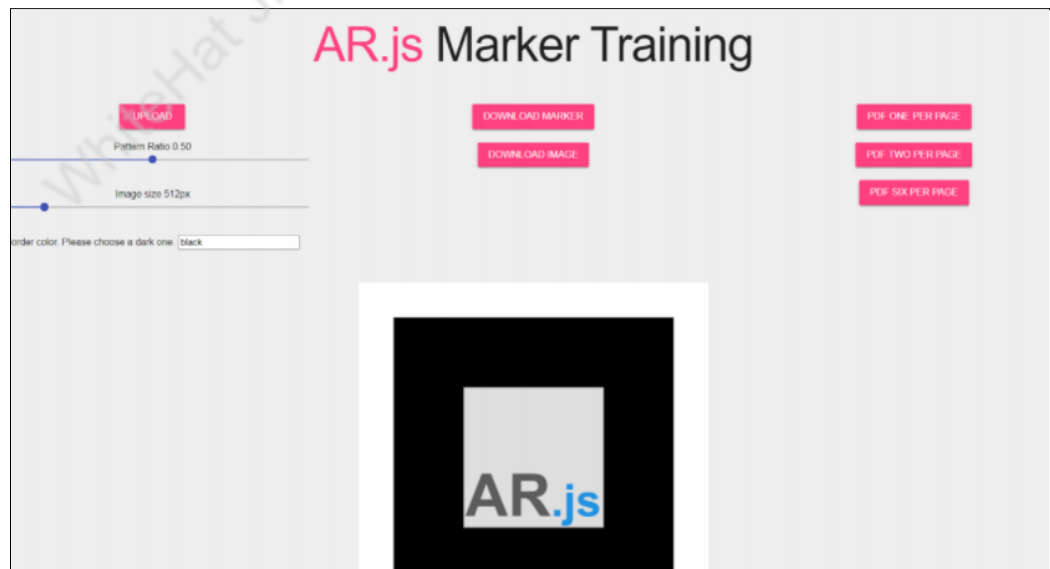
3. Create pattern markers of the 6 images given in the assets folder:
   ● Open the link to create a pattern marker
   ● Upload the first icon image to generate a pattern marker and a pattern image

- Download the pattern marker and pattern image.

- Repeat the activity for all other 5 icon images.

4. Add the pattern marker to the scene for each project using <a-marker> or <a-marker-camera> tag.

```
<!-- Project Virtual Flight -->
<a-marker-camera type="pattern" url="./pattern-marker/virtual-flight/pattern-icon-01.patt">

</a-marker-camera>
```

```
<!-- Project Virtual Tour -->
<a-marker-camera type="pattern" url="./pattern-marker/virtual-tour/pattern-icon-04.patt">

</a-marker-camera>
```

```
<!-- Project Virtual Shooting Game -->
<a-marker-camera type="pattern" url="./pattern-marker/shooting-game/pattern-icon-03.patt">

</a-marker-camera>
```

```html
<!-- Project AR Menu Card -->
<a-marker-camera type="pattern" url="./pattern-marker/ar-menu-card/pattern-icon-02.patt">

</a-marker-camera>
```

```html
<!-- Project AR Navigation-->
<a-marker-camera type="pattern" url="./pattern-marker/ar-navigation/pattern-icon-03.patt">

</a-marker-camera>
```

```html
<!-- Project AR Face Recoginition-->
<a-marker-camera type="pattern" url="./pattern-marker/ar-face-recognition/pattern-icon-06.patt">

</a-marker-camera>
```

5. Add the video or image as a child of the <a-marker>

```html
<a-assets>

  <img id="card2" src="./VR-AR-ProjectCards/2.png">
  <img id="card3" src="./VR-AR-ProjectCards/3.png">
  <img id="card4" src="./VR-AR-ProjectCards/4.png">
  <img id="card5" src="./VR-AR-ProjectCards/5.png">
  <img id="card6" src="./VR-AR-ProjectCards/6.png">

</a-assets>


<!-- Project Virtual Flight -->
<a-marker type="pattern" url="pattern-marker/virtual-flight/pattern-icon-01.patt">
  <a-plane src="#card2" position="0 0 -1" width="2" height="1.5" rotation="-90 0 0"></a-plane>
</a-marker>

<!-- Project Virtual Tour -->
<a-marker type="pattern" url="pattern-marker/virtual-tour/pattern-icon-04.patt">
  <a-plane src="#card3" position="0 0 -1" width="2" height="1.5" rotation="-90 0 0"></a-plane>
</a-marker>
```

6. Host the project by creating a new repo and get the hosted link.

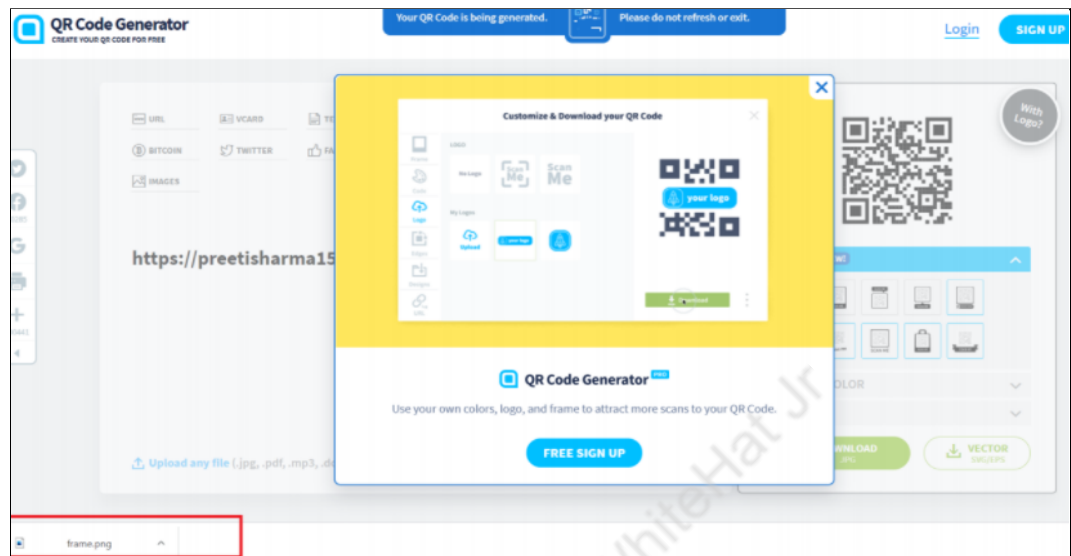7. Get the QR Code for the hosted link of this project:
   ● Open QR Generator link
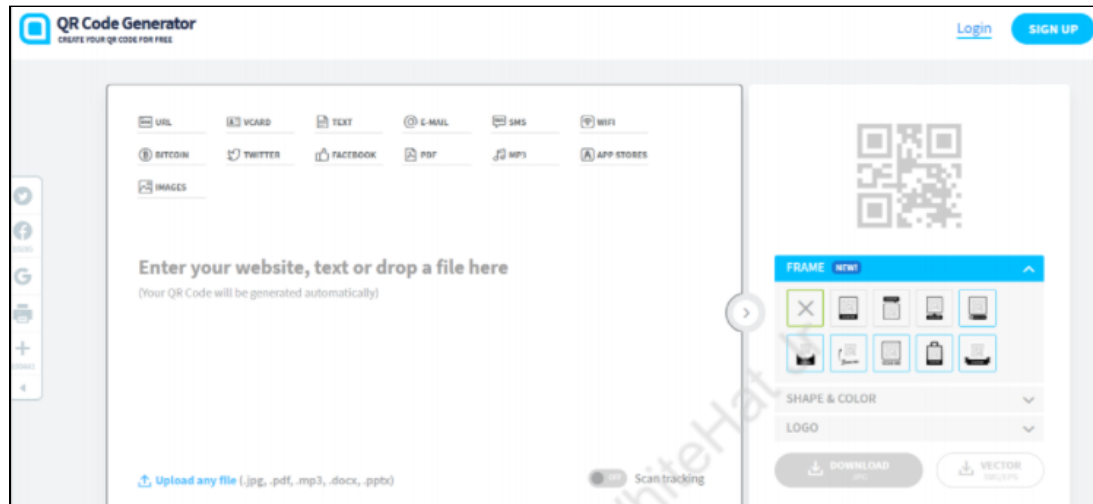
   ● Paste the GitHub hosted Link
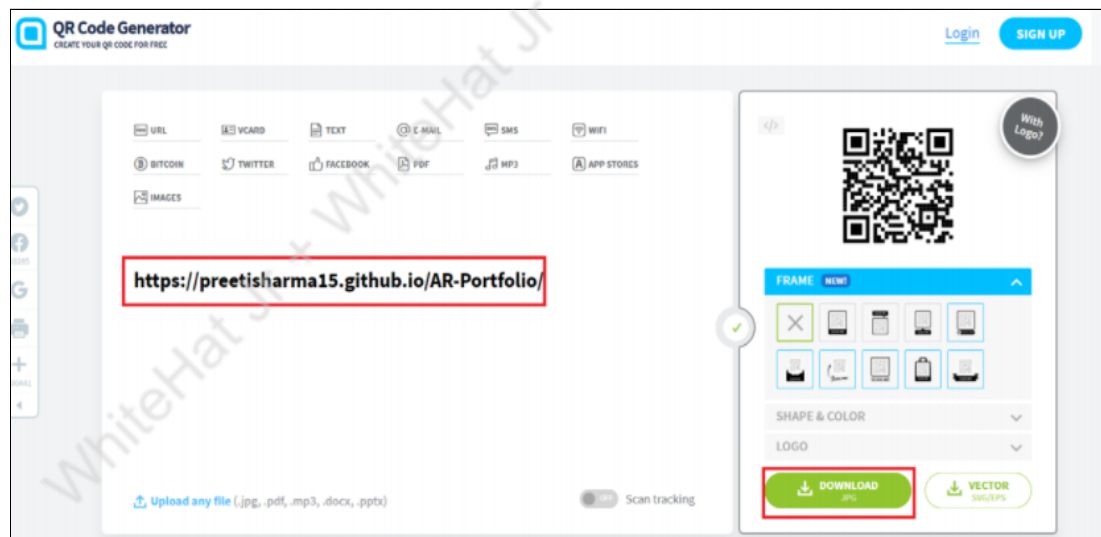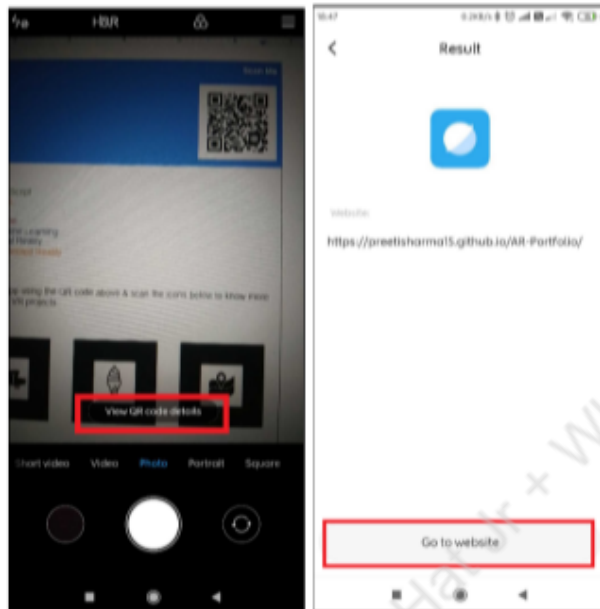
- Click download.

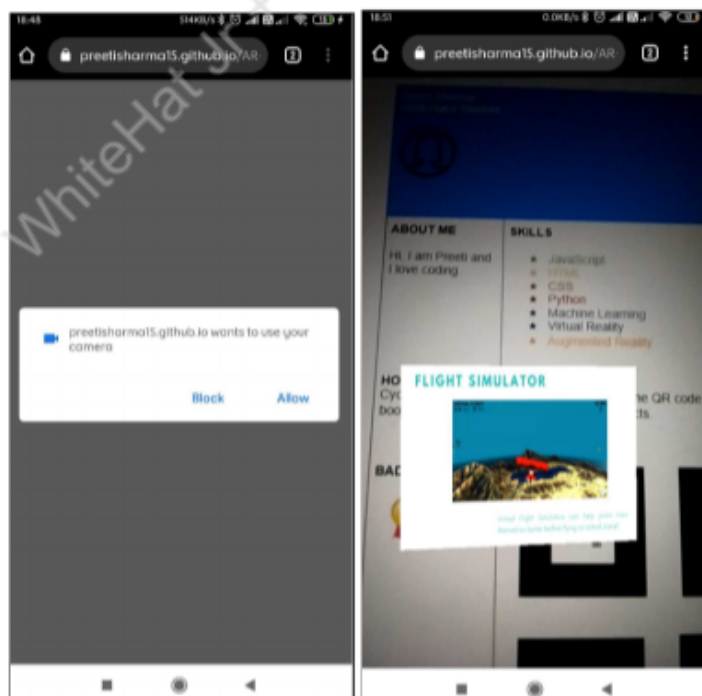8. Design the portfolio page in the Google docs/Microsoft Docs

9. Test the output:
- ● Scan the QR marker at top with the QR Scanner app(download the app if it is not available in your phone.)
- ● Click on Go to the website

- ● Scan the markers in the portfolio to see the image/video content over the respective pattern markers.

We have successfully learned to generate QR Code for the hosted GitHub project link and create an Augmented reality portfolio with pattern markers.

What's NEXT?

In the next class, you will work on your projects and I will guide you to design your own projects.

EXTEND YOUR KNOWLEDGE:

- You can refer to the link below to explore more about A-Frame
  A-Frame