PRO-C186

WhiteHat Jr
Live Online Coding for Kids

WRAPPING UP VR

What is our GOAL for this MODULE?

We revised the Virtual reality(VR) concepts learned during the module and created a firework burst effect

What did we ACHIEVE in the class TODAY?

- We revised the Virtual reality(VR) concepts
- We learned to create a firework burst effect

Which CONCEPTS/CODING BLOCKS did we cover today?

- <a-entity>,<a-camera> etc
- aframe-spe-particles-component

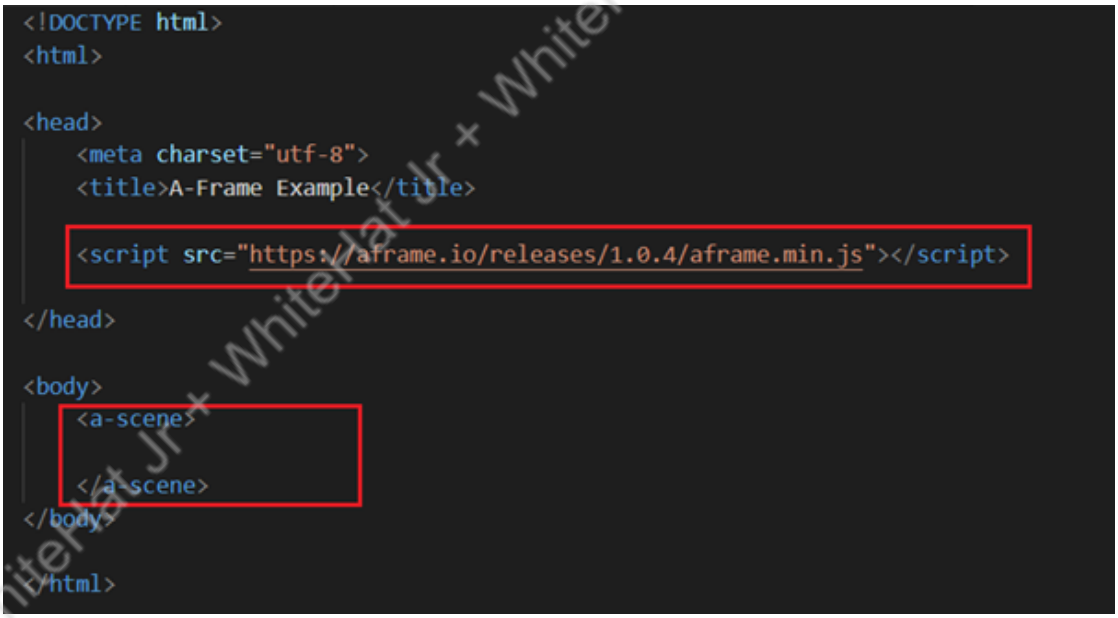
How did we DO the activities?

We revised the virtual reality concepts:

Framework:

- A-Frame is a framework to create Web-Based Virtual Reality environments/simulations.
- A-Frame HTML & JavaScript-based framework.

Creating **Virtual Environment Scene**: <a-scene>



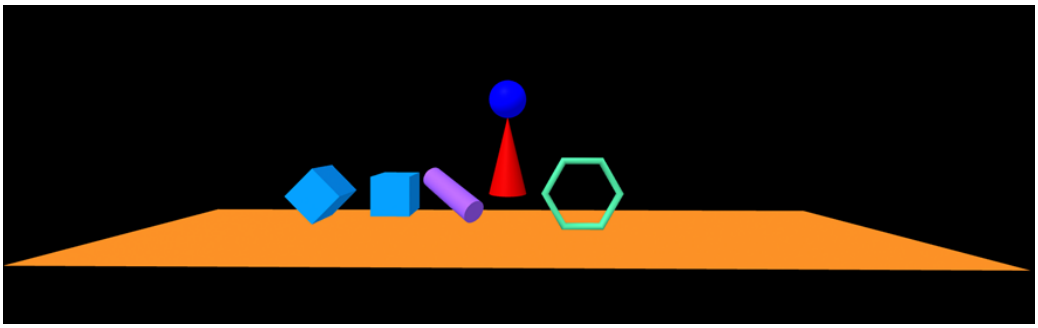
A-Frame Camera:

- <a-camera> primitive or camera component. The camera decides what we can see in the scene. The camera always points towards the -ve z-axis(into the computer, away from us) in the scene.

```
<body>
    <a-scene>
        <a-camera position="0 1.6 0"></a-camera>
    </a-scene>
</body>
```

A-Frame Primitives:

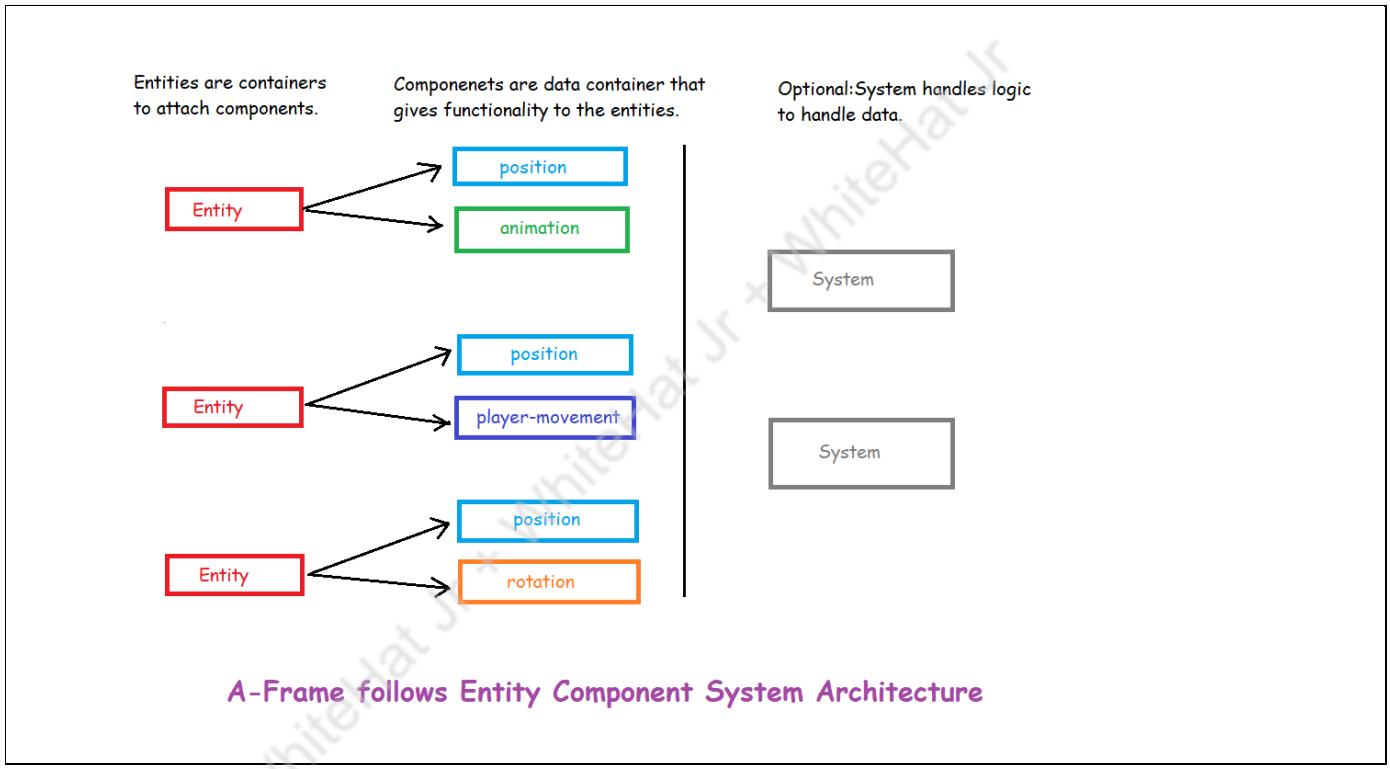
- A few A-Frame primitives have been created to add 3D objects in the scene using just tag similar to HTML such as:
- <a-box>; <a-sphere> ; <a-torus> ; <a-cylinder>; <a-cone>; <a-plane> ;



A-Frame Entities: <a-entity>

- Entities are container objects.
- Entities do not have any properties to render anything on their own.
- We can attach components to the entities to render objects in the scene

ECS Architecture :



A-Frame follows Entity Component System Architecture

Parent-Child Entity:

```
<a-entity id=”parent”>
    <a-entity id=”child-level-1>
        <a-entity id=”child-level-2>
    </a-entity>
</a-entity>
```

```
</a-entity>
```

A few of the pre-defined components in A-Frame:

- Environment
- Light
- Camera
- Text
- Rotation
- Position
- Scale
- Wasd-controls
- Animation
- Sound

Registering our own components:

```
AFRAME.registerComponents('name',{

    schema:{

    dataVar1:  {type: "string", default: " "},

    dataVar2:  {type: "number", default: 0}

    },

    init: function() {

     console.log(this.data.dataVar1)

    },

    update:function() {},

    tick:function() {},
```

```
})
```

Asset Management:

This is used to preload(before the scene is loaded) all the assets:

```
<a-assets>
    <a-asset-item></a-asset-item>
    <img>
    <video>
    <audio>
</a-assets>
```

Cursor: <a-cursor></a-cursor> :

Cursor Based events:

- click
- mouseenter
- mouseleave

Navigation Meshes:

- Navigation Meshes are 3D Meshes(Models) that are created to convert the virtual environment into walkable and non-walkable areas.
- A-Frame aframe-inspector-plugin-recast component can help us build navigation meshes very easily.
- Using these components, we can create the mesh using the tool in the A-Frame framework.

Create an HTML file and set up the A-Frame project to set the basic A-Frame scene.

```
<!DOCTYPE html>
<html>

<head>

    <script src="https://aframe.io/releases/1.0.4/aframe.min.js"></script>


</head>

<body>
    <a-scene id="scene">


        <a-sky color="#000000"></a-sky>

        <a-camera position="0 0 50"></a-camera>
    </a-scene>
</body>

</html>
```


Add the library link for the aframe-spe-particles-component

```
<head>

    <script src="https://aframe.io/releases/1.0.4/aframe.min.js"></script>

    <script src="https://unpkg.com/aframe-spe-particles-component@^1.0.4/dist/aframe-spe-particles-component.min.js"></script>

</head>
```

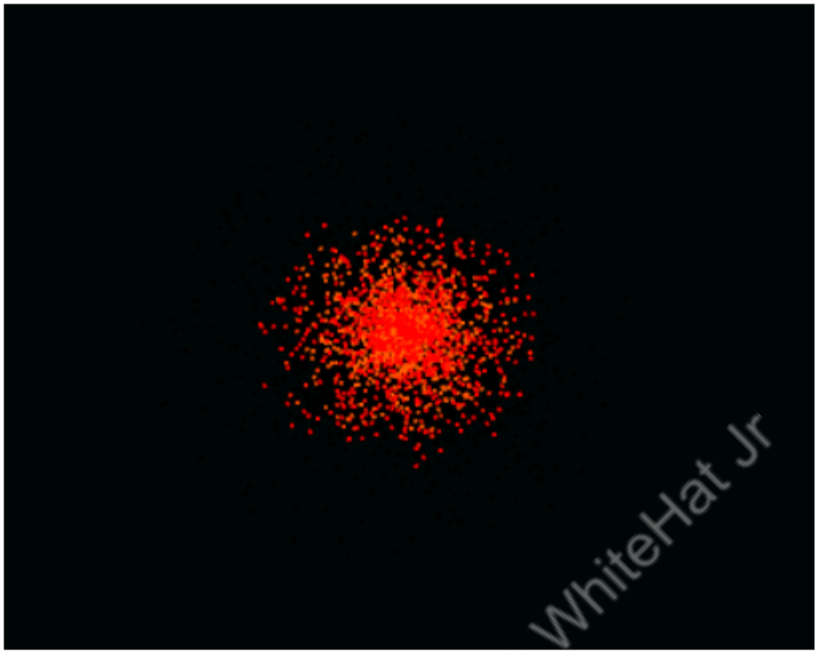
Add the entity and attach the spe-particles component.

```
<a-entity position="0 1 0 " spe-particles="    ">
</a-entity>
```

Write the properties of the component:

```
<a-entity position="0 1 0 " spe-particles="
color: yellow, red, cyan, black;
distribution: sphere;
randomize-velocity: true;
radius: 1;
particle-count: 800;
velocity: 1;
velocity-spread: 15;
drag: 1;
max-age: 2;
duration: -1,
blending: additive;
active-multiplier: 1000;
size: 1, 1, 1, 0">
</a-entity>
```


Test the output.



We have successfully learned to use one predefined component to create a firework burst effect.

What's NEXT?

In the next class, we will be revising some of the concepts we had learned earlier for Augmented Reality to create something completely out of our imagination!

EXTEND YOUR KNOWLEDGE:

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