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You can also view the source files for the DIAversity project: [app.ts](#), [hmd.ts](#), [ui.ts](#), [frustumVisualizer.ts](#), [main.ts](#)

(note that any links directing to other domains will not work)

### Question 1 (1 point)

Rank the tools from the most accessible (for developers without coding experience to use) to the least.

- |                                |                   |
|--------------------------------|-------------------|
| <input type="text" value="3"/> | OpenXR SDK in C++ |
| <input type="text" value="2"/> | Unity             |
| <input type="text" value="1"/> | CoSpaces          |

### Question 2 (1 point)

You need to implement a cross-platform native VR experience using a novel hand tracking algorithm and you want to focus on implementing VR components with the same underlying code-base across Meta's Quest HMDs, HTC's Vive HMDs, Google Cardboard. You hope to align it to an open standard so that there is a vibrant developer ecosystem and that the underlying tooling will be constantly improved. What standard should you be targeting?

- ☐ OpenCL
- ☐ Vulkan
- ☒ OpenXR
- ☐ WebXR
- ☐ OpenGL
- ☐ WebGL

### Question 3 (1 point)

You introduced a new `"/components"` directory containing new source files that are

part of your Babylon.js project. Which file should you modify to make sure your web app still runs?

- ☐ app.ts      main application logic file
- ☐ package-lock.json      Ensures consistent dependency versions across different environments
- ☒ tsconfig.json      Configures the TypeScript compiler. It defines how TypeScript code should be compiled to JavaScript, which files to include/exclude, module resolution settings, and more.
- ☐ main.ts      entry point of your TypeScript application
- ☐ index.html      HTML entry point of your web app
- ☐ package.json      project metadata and dependencies. It's essential for Node.js-based projects and helps with dependency management, scripts automation, and project configuration.

#### Question 4 (1 point)

In your WebXR typescript-based app, you have edited a file in your project directory to specify that the Babylon.js version should be 7.3.0.

After running `npm install`, a file will be automatically updated in your project directory. Name the file in your project directory that will be updated.

package-lock.json



#### Question 5 (1 point)

```
import { Engine, Scene } from "@babylonjs/core";

class App {
  private engine: Engine;

  constructor(engine: Engine) {
    this.engine = engine;
  }

  createScene() {
    const scene = new Scene(this.engine);
    scene.createDefaultCamera(true, true, true);
    scene.createDefaultLight(true);
    return scene;
  }
}
```

```
}

const canvas =
<HTMLCanvasElement>document.getElementById('renderCanvas');
const engine = new Engine(canvas, true);
const app = new App(engine);
app.createScene().then(scene => {
  engine.runRenderLoop(() => {
    scene.render();
  })
});
```

When you run the code above, the following error is shown in the console:

`app.createScene().then' is undefined`

The error is a missing keyword in the code. What is the missing keyword?



Adding `async` makes `createScene()` return a Promise. The `then()` method works on Promises, so this resolves the error

### Question 6 (1 point)

In IPA1, the **package.json** file looks like this:

```
{
  "name": "hello-immersive",
  "private": true,
  "version": "0.0.0",
  "type": "module",
  "scripts": {
    "dev": "vite",
    "build": "tsc && vite build",
    "preview": "vite preview",
    "test": "vitest --reporter=verbose",
    "test:ui": "vitest --ui",
    "test:run": "vitest --run",
```

```
    "clean": "rm -rf dist node_modules package-lock.json"
  },
  "devDependencies": {
    "@vitest/ui": "^1.1.1",
    "typescript": "^5.2.2",
    "vite": "^5.0.8",
    "vitest": "^1.1.1"
  },
  "dependencies": {
    "@babylonjs/core": "^6.36.1"
  }
}
```

You want to deploy your Babylon.js application to a web server. What should you run in the terminal to get the files to deploy?

- ☐ npm run preview
- ☐ npm run vite
- ☐ npm run test
- ☒ npm run build
- ☐ npm run dev

#### Question 7 (1 point)

Where is `createScene(...)` normally defined?

- ☐ package.json
- ☐ tsconfig.json
- ☐ index.html
- ☒ app.ts
- ☐ package-lock.json

#### Question 8 (1 point)

Which file should you add to your team's version control if you want the project

dependencies to have the same exact versions across your team?

- ☐ index.html
- ☐ app.ts
- ☐ package.json
- ☐ tsconfig.json
- ☒ package-lock.json

### Question 9 (1 point)

You want to add a custom script as part of your BabylonJS project test workflow. Which file should you modify?

- ☐ index.html
- ☒ package.json
- ☐ app.ts
- ☐ package-lock.json
- ☐ tsconfig.json

### Question 10 (1 point)

When connecting the Meta Quest 2, there is no prompt to enable connection and I can't see developer options in the settings. What is the likely issue?

- ☐ Headset is in low power mode
- ☐ Did not tap the Build Number 7 times in settings
- ☐ Did not connect a USB data cable from PC to headset
- ☒ Did not enable Developer Mode on the Meta Horizon app on the phone

### Question 11 (1 point)

What does the following Babylon.js snippet accomplish?

```
const xr = await scene.createDefaultXRExperienceAsync({  
  uiOptions: {
```

```
        sessionMode: "immersive-vr",  
    },  
});
```

- ☐ Creates a default BabylonJS scene with a sphere and plane, and then initializes typical components for VR experiences.
- ☐ Initializes typical components for hybrid XR (AR & VR) experience.
- ☒ Makes a non-blocking method call to initialize typical components for VR experiences.
- ☐ Creates a default BabylonJS scene with a sphere and plane.

### Question 12 (1 point)

Please write any feedback you have so far, for this CSD312x module

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