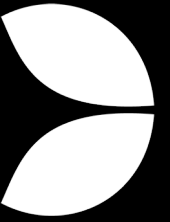


# Rat race

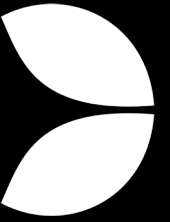
08.04.2022 Uldis Baurovskis, Armands Baurovskis

# Agenda

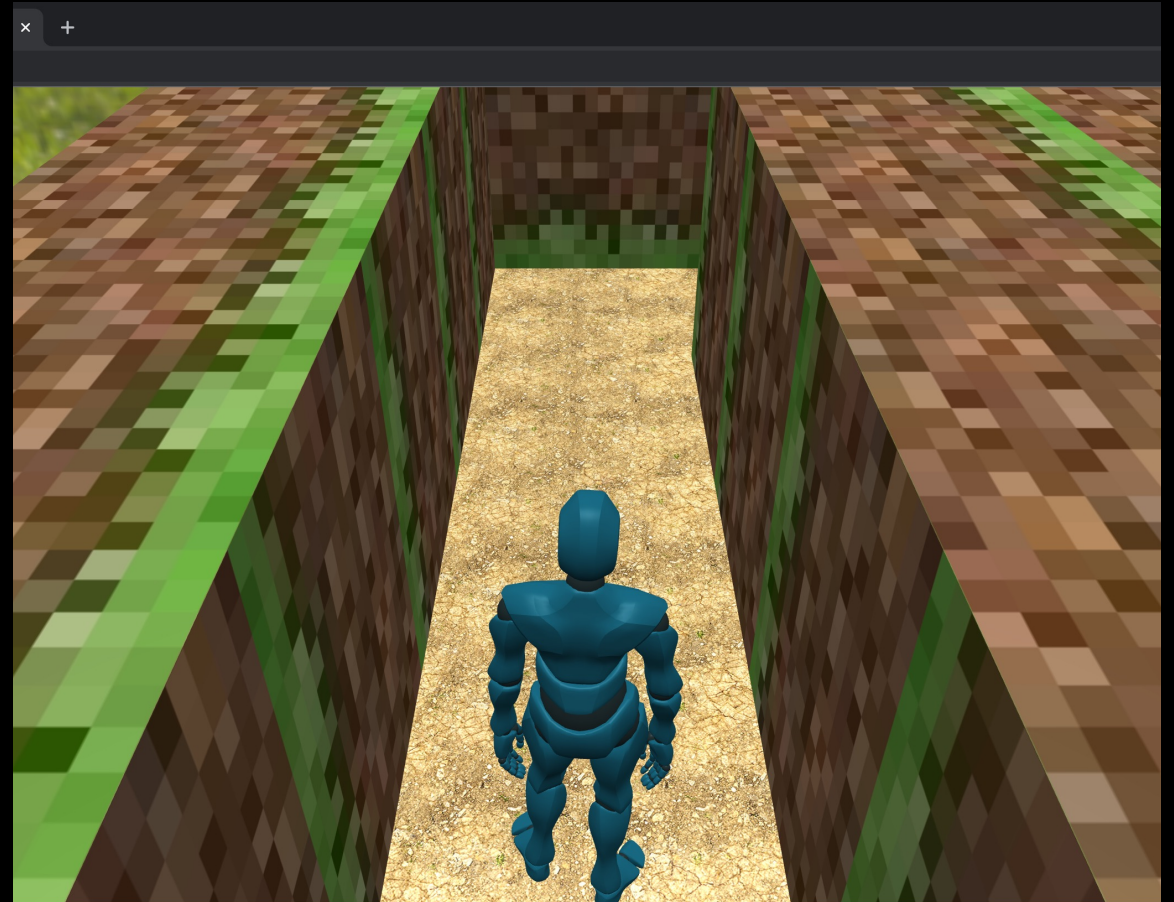


- Game preparation
- Creating the maze
- Skybox
- Player modal
- Player camera
- Inputs
- Player animations
- Collisions

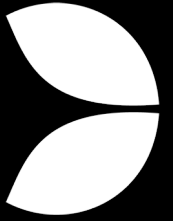
# Game preparation



- Maze world with character in it
- Character can move through maze to explore it



# Creating the maze



- Maze will consist from two parts
  - Ground
  - Walls
- Maze map is generated from JSON file
  - 20x20 array
  - 0 – no wall,
  - 1 – wall,
  - 2 – user start position

```
"maze": [  
1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,  
1,1,0,0,0,1,1,1,1,1,1,0,0,0,1,1,0,0,0,1,  
1,0,0,1,0,1,0,0,0,0,0,0,1,0,0,0,0,0,0,1,  
1,0,1,1,0,1,0,0,0,0,1,1,1,0,1,1,0,0,0,1,  
1,0,1,1,0,1,0,0,0,0,1,1,1,0,1,1,1,1,0,1,  
1,0,1,1,0,1,0,0,0,0,1,1,1,0,1,1,1,1,0,1,  
1,0,1,1,0,0,0,0,0,0,0,0,1,0,0,0,0,0,0,1,  
1,0,0,0,0,1,1,1,1,1,0,1,0,1,1,0,1,1,0,1,  
1,1,1,0,1,1,1,1,1,1,0,0,0,1,1,0,1,1,0,1,  
1,1,1,0,1,1,1,1,1,1,1,1,1,1,1,0,1,1,0,1,  
1,1,0,0,0,1,1,1,0,0,0,0,0,1,1,0,1,1,0,1,  
1,1,0,0,0,1,1,1,0,1,1,1,0,0,0,0,1,1,0,1,  
1,0,0,0,0,0,0,0,0,0,1,0,0,0,1,1,1,1,0,1,  
1,1,1,0,1,0,1,1,0,1,0,0,0,1,1,0,0,0,0,1,  
1,0,0,0,1,0,0,0,0,1,0,0,0,1,1,0,1,1,0,1,  
1,0,1,1,1,1,0,1,1,1,1,1,0,0,0,0,1,1,0,1,  
1,0,1,1,0,1,0,1,1,1,1,1,0,1,1,1,1,0,0,1,  
1,0,1,1,0,0,0,0,0,1,1,1,0,0,0,0,1,0,1,1,  
1,2,1,1,0,1,1,1,1,1,1,1,1,1,1,0,0,0,1,1,  
1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1  
]
```

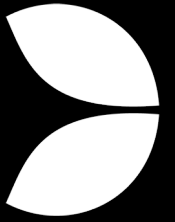


# Creating the maze (continue)

- Creating ground
  - Ground mesh
- Creating walls
  - Box meshes

```
const ground = CreateGround("ground", { width: 1, height: 1 }, scene);  
const wall = CreateBox("wall", { width: 1, height: 1, depth: 1 }, scene);
```

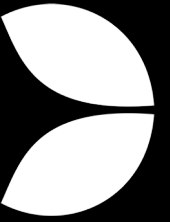
# Creating the maze (continue)



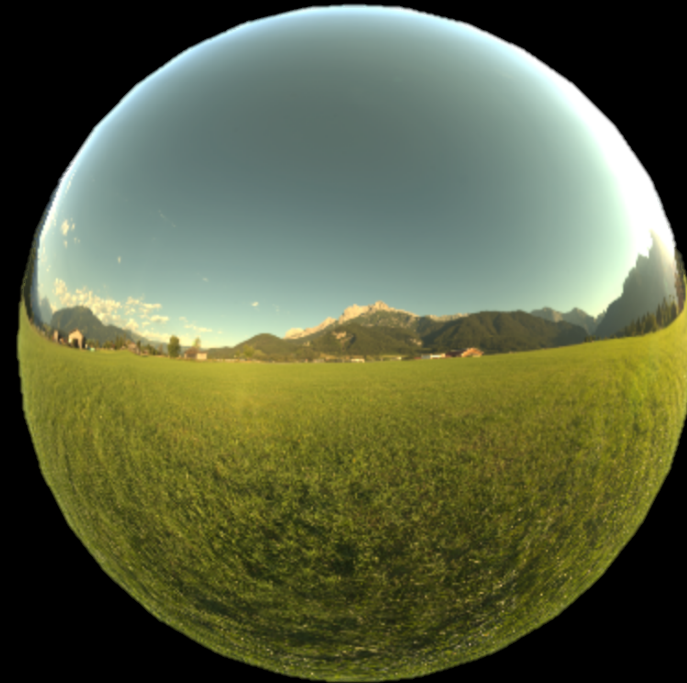
- Texturing
  - Asset manager
  - Load ground and wall texture
  - Add texture to meshes

```
const assetManager = new AssetsManager(this.scene);  
assetManager.addTextureTask("load-ground", "ground.png");  
assetManager.addTextureTask("load-wall", "wall.png");  
assetManager.loadAsync();
```

# Skybox

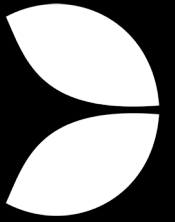


- Skybox is horizon texture to simulate real world environment
- Load skybox texture
- Add skybox to scene



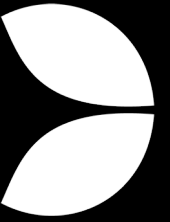
# Player model

- Load premade player modal in Babylon format
  - Includes model
  - all necessary animations
- Add player to scene
- Move player to start position on maze





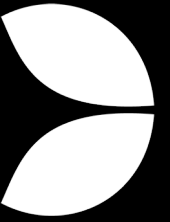
# Player camera



- Create FreeCamera
- Attach camera to player
- Enable camera

```
const camera = new FreeCamera("camera", Vector3.Zero(), scene);  
camera.parent = this;  
camera.position.set(0, getSize(this).y + 1.5, -2);  
camera.setTarget(new Vector3(0, getSize(this).y, 0));  
camera.getScene().activeCamera = camera;
```

# Inputs



- Keyboard inputs
  - Listen keyboard events for WASD keys
- Move character based on inputs
  - Forward/Backward
  - Rotate

```
switch(info.event.code) {  
    case "KeyW":  
        // Move forward  
        break;  
    case "KeyS":  
        // Move backwards  
        break;  
    case "KeyA":  
        // Rotate left  
        break;  
    case "KeyD":  
        // Rotate right  
        break;  
}
```

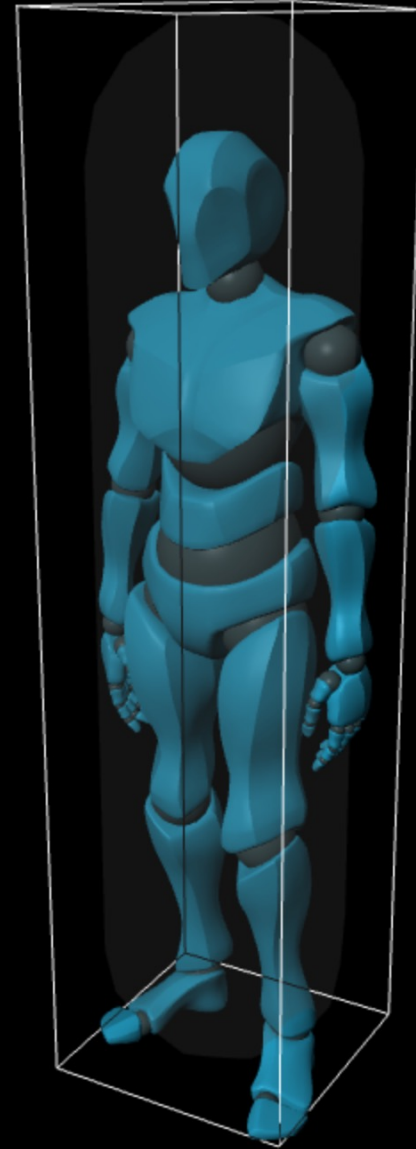
# Player animations

- Idle animation for standing state
- Walking animation for movement

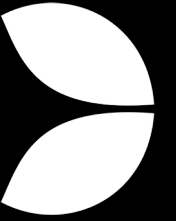


# Collisions

- Add collision checks for wall
- Move character with collision detection



# Homework



- Try out concepts learned in lecture
- Recreate game from lecture
- Play with different maze layouts
- Check out different lightning possibilities
- Share video / images in slack channel

# Q&A