BIRZEIT UNIVERSITY

Advanced Computer Systems Engineering Laboratory – ENCS5150

TODO 2: Day-Night Cycle Animation

Objective:

Develop an Android application that demonstrates a day-night cycle animation using Android Studio. The app should have a gradual transition between day and night, including the rotation of the sun and moon, as well as cloud movement.

Assets Required:

1. Day background image.
2. Night background image.
3. Sun image (with a transparent background in PNG format).
4. Moon image (with a transparent background in PNG format).
5. Cloud image (with a transparent background in PNG format).

Animation Logic:

1. Sun Animation:
    - The sun rotates in and out of the screen.
    - The rotation center for the sun and moon animations is set at the middle of the screen on the X-axis and at the bottom of the screen on the Y-axis.

2. Day-Night Transition:
    - The simulation begins in the middle of the day (the sun is in the middle of the x-axis).
    - While the sun is moving (clockwise), the day background remains apparent.
    - Gradually fade in the night background after the sun is out of the screen and start rotating the moon on the same path as the sun (also clockwise).
    - The moon will enter the screen from the left side and will move exactly like the sun and will leave the screen from the right side.
    - As the moon exits the screen, fade out the night background smoothly to show the day background.
    - Transition back to the day background with the sun's appearance.

3. Cloud Movement:
    - Have two cloud images moving in translation across the screen (on the x-axis).
    - One cloud should be above the sun and one behind it, so if the sun happens to be in the same position as the first cloud, the sun will be behind. And if the sun and the second cloud were in the same position, the cloud would be behind.
    - One of the clouds translation duration should be 8 seconds, the other cloud 12 seconds.

The following figure explains the whole scene:

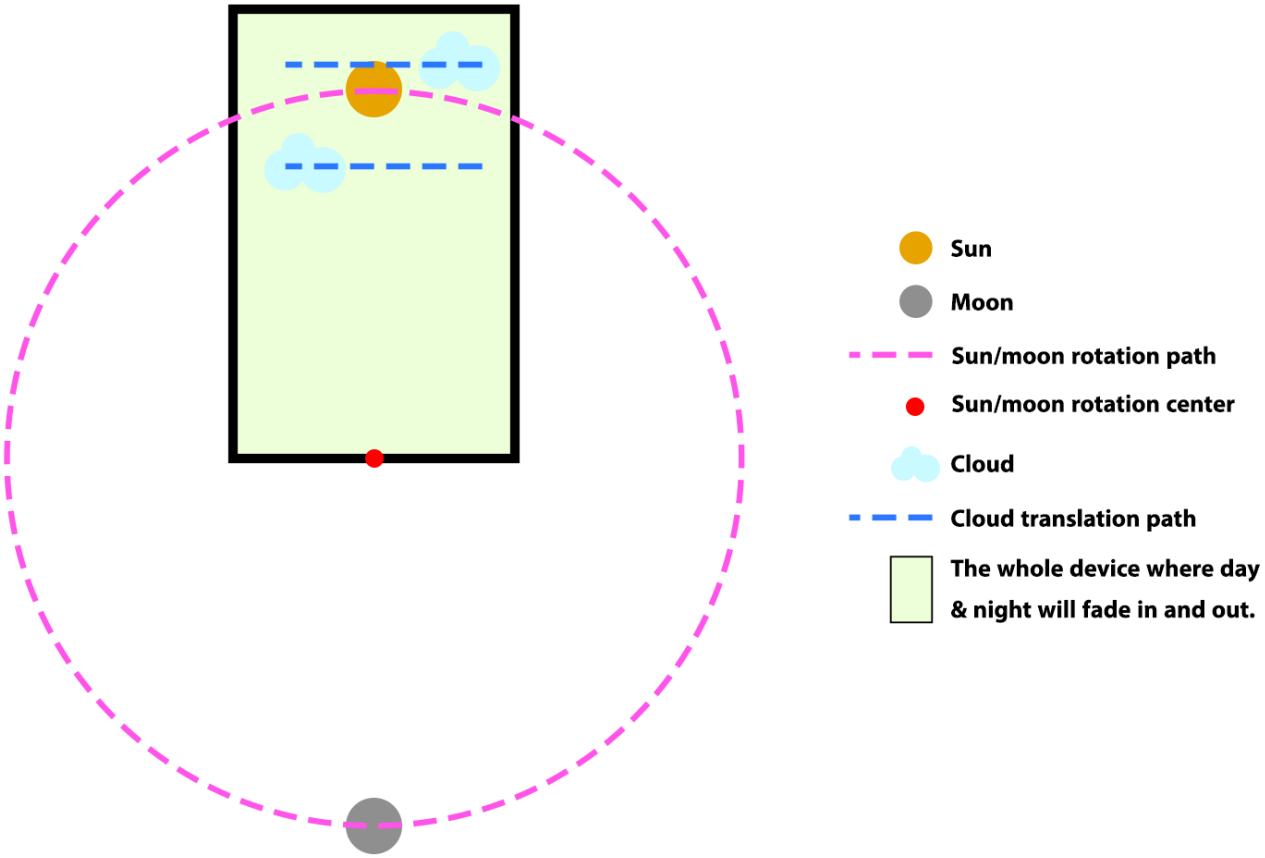

Figure 1: Abstract explanation for the scene

Notes:

- Utilize PNG images for the sun, the moon, and the clouds to avoid white backgrounds.

- Don't use abstracted objects (circles/squares ...) to represent the objects in this simulation, instead use clipart/emojis/real-life images.
- The whole day and night cycle should be 20 seconds, 10 for the day and 10 for the night.
- The transition between the day/night backgrounds should not happen instantaneously, there should be a fade-in and fade-out to gradually switch between them.
- As shown in Figure 1, both the sun and the moon move exactly on the same path and in the same direction (clockwise).
- The size of the objects should be relatively close to the objects in Figure 1, avoid very large and very small sizes (e.g. a sun that fills the whole screen or a cloud that is very small and barely visible).

- The day/night backgrounds should fill the whole screen.
- The name of the application must be “ID_FirstName_LastName”.
- Use Pixel 3a XL device with API Level 26 (Graphic=Software).
- ToDo is individual work and cheating will result in a **0 mark**.
- What to submit:
    1. Project.zip file (Size in KB)
       From Android Studio: File → Export → Export to Zip File
    2. APK file
       From Android Studio: Build → Build Bundle(s) / APK(s) → Build APK(s)
       You will find the APK file under “app\build\outputs\apk\debug\app-debug.apk”

  Send both the APK file and the ZIP file as a reply to my message.

- Deadline: **14/12/2023 Midnight**