

Computer Graphics

Assignment 1

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Questions:

1. What is the difference in the implementation of the two methodologies mentioned in C.2. a. and C.2.b.? (Hint: how would the transformation matrices for the primitives be managed?)

Ans) In the first method, the transformation matrix needs to be updated only for that element, other elements stay stationary, reducing the complexity of the scene and increasing efficiency. In the second method, any element is moved at any time, and hence there's added complexity in the computation of transformation matrices.

2. What API is critical in the implementation of “picking” using mouse button click?

Ans) Document Event Listener is a critical API not just for tracking mouse position but also key click.

3. What would be a good alternative to minimize the number of key click events used in this application? Your solution should include how the mode-value changes are incorporated.

Ans) One good alternative would be to provide buttons on the dom, to change modes and use of mouse drag to move elements, use of scrolling for scaling the element can reduce the number of key clicks.

4. Why is the use of centroid important in transforming a primitive or a group of primitives? (Hint: transformations such as rotation and scaling.).

Ans) The centroid is important to specify the point for the primitive or group of primitives to rotate about and also for scaling the primitive uniformly.

Assignment Information:

- To have a separate reference area and a separate drawing area, I used `gl.viewport` and `gl.scissor` on the canvas.
- I have also made sure that all elements in R1 stay strictly within R1 in Mode-0
- In Mode-1, the centroids of all the elements stay within R1
- I have also provided functionality to scale individual elements in Mode-1 using the +/- keys.
- In Mode-2, the centroid of all elements stays within R1

Sources Referred to:

- [WebGL Fundamentals](#)
- [JSDoc: Module: mat4](#)
- [GitHub - Amit-Tomar/T2-21-CS-606](#)