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?)**

    a. In method 1, we need to keep updating the transformation matrix of a shape only when that shape is visited, until the time it is being transformed(translated/rotated/scaled). Since 2nd visits are not allowed the transformation matrix would no longer change and hence “updates” are no longer needed.

    b. In method 2, we need to keep updating the transformation matrices until mode 1 ends, since a particular shape can be visited multiple times

    So, the difference lies in the interval of time for which updation of transform matrices is performed in the 2 methods.

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

    Javascript HTML DOM EventListener, which can be activated or used via addEventListener() method, is a critical API in the implementation of “picking” using mouse button 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.**

    To minimize the number of key clicks:

    a. we can directly skip to mode 0 from mode 2, without bothering to move to mode 3 and clearing the canvas.

    b. Also, we can use the mouse clicks and scroll for translating, rotating, and scaling the shapes and figure in modes 1 and 2, rather than using key presses.

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

    Use of centroid is important because:

    a. The rotation of the individual shapes in mode 1 is happening about the z-axis passing through their respective centroids. If that doesn’t happen then the shape would appear to “revolve” instead of “rotate”.

    b. Also, the rotation of the overall figure in mode 2 is achieved by the simultaneous

        i. rotation of centroids of individual shapes about the centroid of the overall figure, and

        ii. rotation of shapes about their individual centroids.

    c. Scaling of a figure in mode 2 is achieved by taking into account the relative motion of individual shapes’ centroids and the centroid of the overall figure.