

**Premier University, Department of CSE**  
**Spring 2025, 7th Semester, Assignment**  
**Course Title:** Computer Graphics and Image Processing, **Course Code:** CSE 455  
**Course Outcome:** CO2, Total Marks: 10

**Problem Statement: Geometric shape generation using different shape generating algorithms**

**Introduction:**

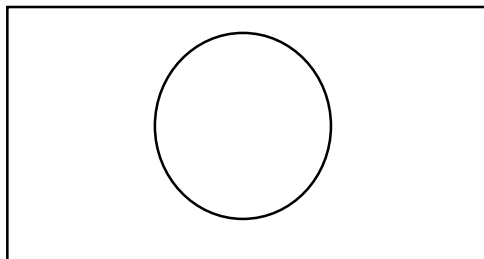
Geometric shape generating algorithms are computational methods that create various shapes, such as polygons, circles, and curves, using mathematical rules and parameters. These algorithms play a fundamental role in computer graphics, design, and engineering, enabling the generation of precise and visually appealing shapes for a wide range of applications. In this assignment, you will apply different types of shape drawing algorithm to draw different shapes.

**Problem Scenario:**

Suppose, you are working as a graphic designer in a company. You design different types of object's shape according to your client's demand. For designing these shapes, you use different types of line drawing algorithms like, Digital Differential Analyzer line drawing algorithm, Bresenham line drawing algorithm, midpoint circle drawing algorithm etc.

**Problem Statement:**

Develop a system to generate and color the flag of Bangladesh of different sizes which will be selected by the user at every time.



**Tasks:**

1. Which algorithms you will pick to develop the system to draw the flag? Also provide the name of the algorithm you will pick to color the hole flag?
2. Develop a code to create a shape like the above flag.
3. Now create a system which will color the flag.
4. Reflect on the advantages and limitations of the algorithms you have selected.

**Submission Guideline:**

- Prepare a report documenting your work.
- Include any programming code or screenshots of the tool used like MATLAB, code blocks etc.
- Briefly address the complex problem-solving questions:
  - a. Does the solution need in-depth engineering knowledge?
  - b. Does the solution involve wide-ranging or conflicting technical, engineering, and other issues?

- c. Is the solution well-known, or does it require abstract thinking and analysis to formulate?
- d. Does the solution involve infrequently encountered issues?
- e. Does the solution need adherence to standards and codes of practice?
- f. Does the solution involve stakeholders with conflicting technical requirements?
- g. Does the solution involve interdependence between sub-problems or parts?

**Evaluation Criteria:**

- i. Proper identification of algorithms.
- ii. Correct implementation of the algorithms to develop the shape.
- iii. Proper implementation of the algorithms to color the shape.
- iv. Clear and concise discussion of the advantages and limitations of the algorithms you have selected.

**Rubrics for Assignment marking:**

Task	Criteria	Good (4-5)	Moderate (2-3)	Poor (1)
i.	Problem solution	Properly or near appropriately reasoned solution	Appropriate solution for some cases	Inappropriate or no solution
ii.	Problem analysis	In-depth analysis	Shallow analysis	Incomplete analysis