



# RAMA UNIVERSITY

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## FACULTY OF ENGINEERING

### Digital Image Processing LECTURE-38

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# OUTLINE

❖ IMAGE SEGMENTATION

❖ REGIONS

❖ STRAIGHT LINES

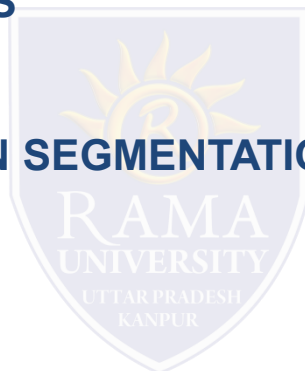
❖ LINES AND CIRCULAR ARCS

❖ REGION SEGMENTATION

❖ MAIN METHODS OF REGION SEGMENTATION

❖ MCQ

❖ REFERENCES



# Image Segmentation

- Image segmentation is the operation of partitioning an
- image into a collection of connected sets of pixels.

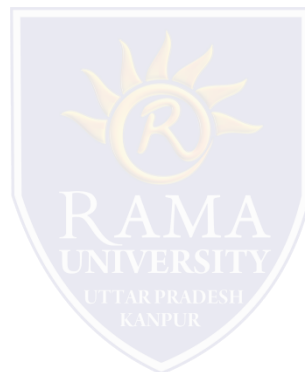
. into regions, which usually cover the image

2. into linear structures, such as

- line segments
- curve segments

3. into 2D shapes, such as

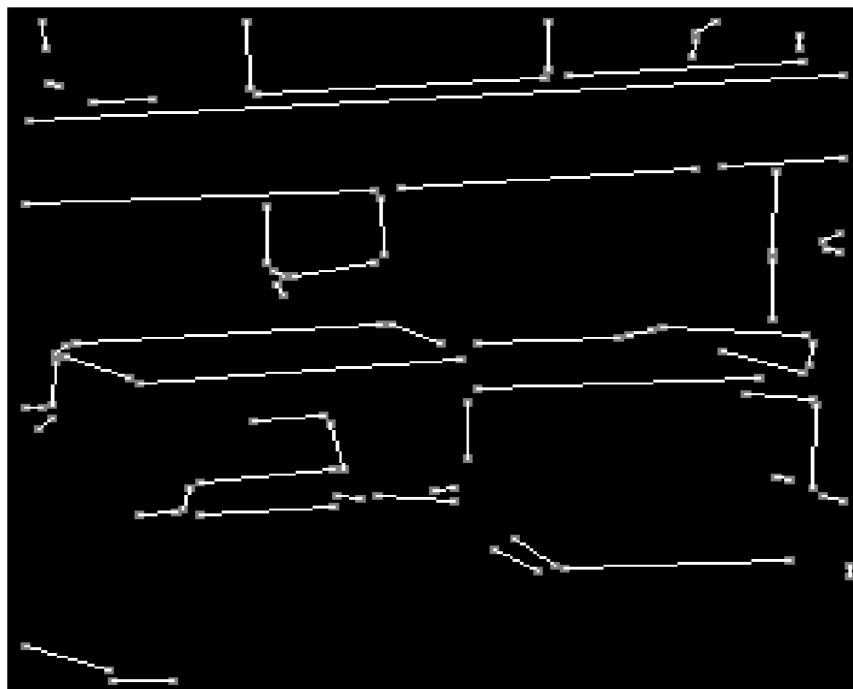
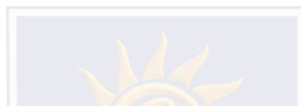
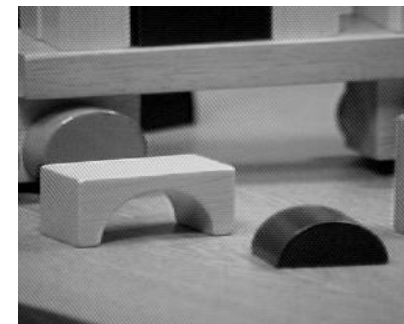
- circles
- ellipses
- ribbons (long, symmetric regions)



# Regions



# Straight Lines



# Lines and Circular Arcs



A segmentation is a partition of an image  $I$  into a set of regions  $S$  satisfying:

1.  $\cup S_i = S$  Partition covers the whole image.
2.  $S_i \cap S_j = \phi, i \neq j$  No regions intersect.
3.  $\forall S_i, P(S_i) = \text{true}$  Homogeneity predicate is satisfied by each region.
4.  $P(S_i \cup S_j) = \text{false}, i \neq j, S_i \text{ adjacent } S_j$  Union of adjacent regions does not satisfy it.

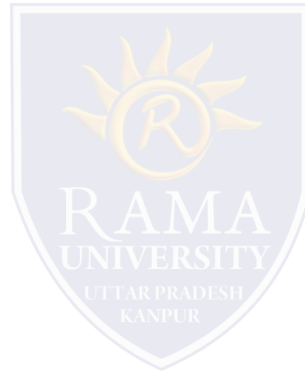
# Main Methods of Region Segmentation

1. Region Growing
2. Clustering
3. Split and Merge





1. To reduce computation if one utilizes non-overlapping regions, it usually produces \_\_\_\_\_ effect.
  - a) Dimming
  - b) Blurred
  - c) Blocky
  - d) None of the Mentioned
2. What does SEM stands for?
  - a) Scanning Electronic Machine
  - b) Self Electronic Machine
  - c) Scanning Electron Microscope
  - d) Scanning Electric Machine
3. The type of Histogram Processing in which pixels are modified based on the intensity distribution of the image is called \_\_\_\_\_.
  - a) Intensive
  - b) Local
  - c) Global
  - d) Random

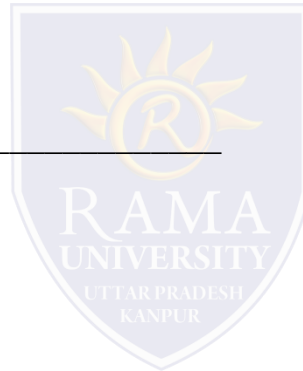


4. Which type of Histogram Processing is suited for minute detailed enhancements?

- a) Intensive
- b) Local
- c) Global
- d) Random

5. In uniform PDF, the expansion of PDF is \_\_\_\_\_

- a) Portable Document Format
- b) Post Derivation Function
- c) Previously Derived Function
- d) Probability Density Function



# References

- Dr. Mike Spann [m.spann@bham.ac.uk](mailto:m.spann@bham.ac.uk) <http://www.eee.bham.ac.uk/spannm>
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