



# SNS COLLEGE OF TECHNOLOGY

Coimbatore-35  
An Autonomous Institution



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Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

## DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

### 19ECE351 – IMAGE PROCESSING AND COMPUTER VISION

III B.E. ECE / V SEMESTER

IMAGE COMPRESSION AND  
SEGMENTATION/19ECE351 - DIGITAL  
IMAGE PROCESSING/ PRADEEPA M/ AP/  
SNSCT

### UNIT 3 – IMAGE COMPRESSION AND IMAGE SEGMENTATION

TOPIC – INTRODUCTION



# IMAGE COMPRESSION

- ✓ Image compression is very important task in image processing
- ✓ Images and Videos require lots of space and large transmission time

✓ **Data compression is the process of encoding data so that it takes less storage space or less transmission time than it would if it were not compressed**

## Data Compression:

It is the Mathematical process of transforming data to a smaller representation from the original



- ✓  If  $N1 = N2$  There is no compression
- ✓  If  $N2 \ll N1$  There is significant Compression
- If  $N1 \ll N2$  Data Explosion



# IMAGE COMPRESSION

## Data and Information are two different things:

- ✓  Data is raw facts which are encountered in image processing
- ✓  Information is an interpretation of the data in a meaningful way
- ✓  Data is the means by which information is conveyed

## Types of Data

Text Data	Binary Data	Image Data	Graphics Data	Sound Data	Video Data
<ul style="list-style-type: none"><li>• Data present in flat files</li><li>• It can be read and understood by human beings</li></ul>	<ul style="list-style-type: none"><li>• Machine can interpret it</li><li>• Ex: metadata present in database files</li></ul>	<ul style="list-style-type: none"><li>• This is pixel data</li><li>• It contains intensity and color information of image</li></ul>	<ul style="list-style-type: none"><li>• This data is in vector form</li></ul>	<ul style="list-style-type: none"><li>• This is audio information</li></ul>	<ul style="list-style-type: none"><li>• This represents video information</li></ul>



## IMAGE COMPRESSION

- ❑ The same **information** can be represented by different amount of **data** – for example:

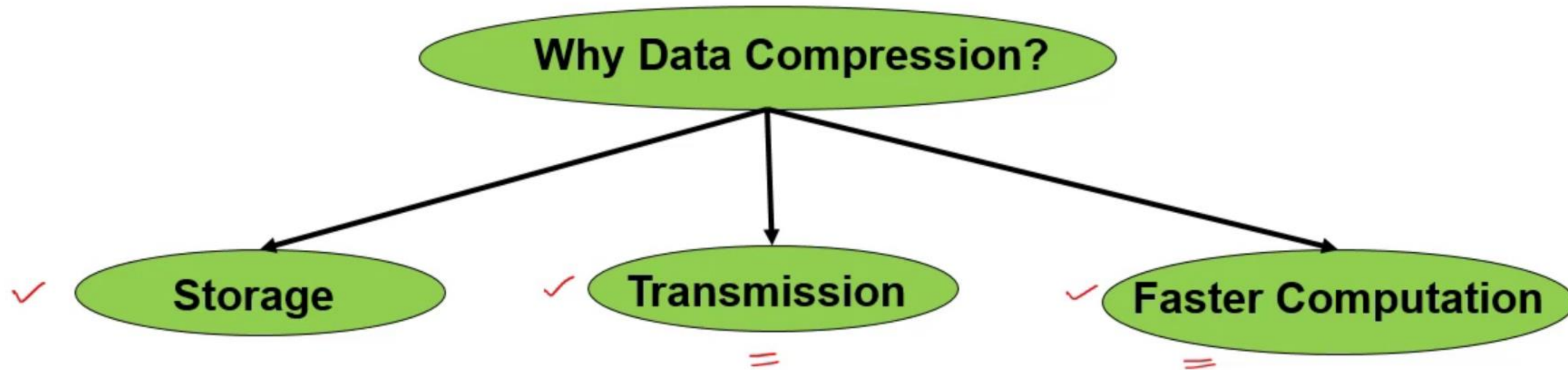
**Example 1:** your brother, rohit, will meet you at IGI airport in new delhi at 5 minutes past 6:00 pm tomorrow night

**Example 2:** your brother will meet you at IGI airport at 5 minutes past 6:00 pm tomorrow night

**Example 3:** rohit will meet you at IGI at 6:00 pm tomorrow night



# IMAGE COMPRESSION

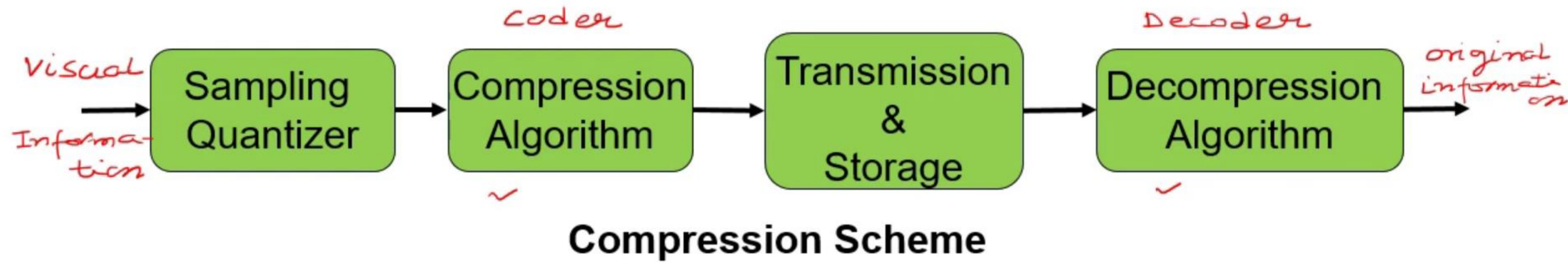


## Applications of Data Compression:

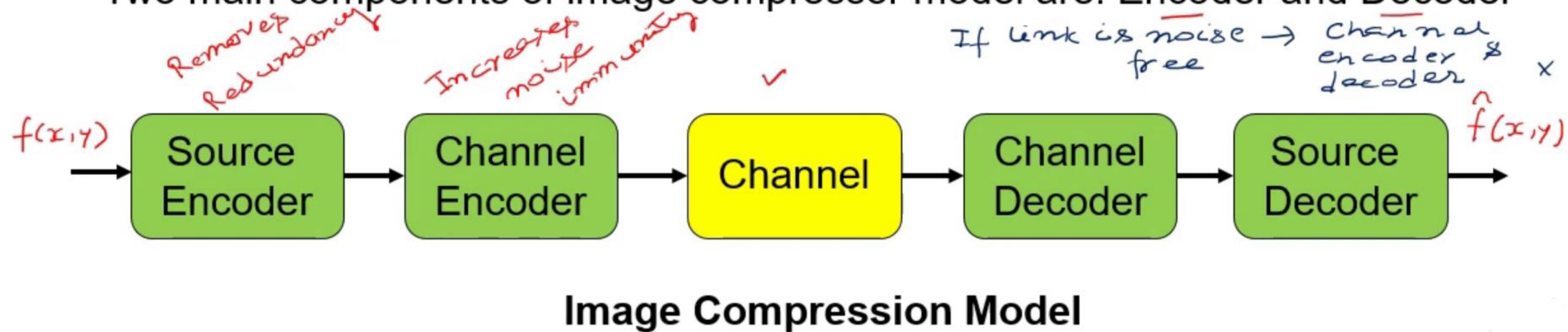
- ✓  Personal communication like Facsimile, Voice mail and telephony
- ✓  Computer networks – Internet
- ✓  Multimedia applications
- ✓  Image and signal processing
- ✓  Digital and Satellite TV
- ✓  Video conferencing and Digital Library



# IMAGE COMPRESSION



Two main components of image compressor model are: Encoder and Decoder

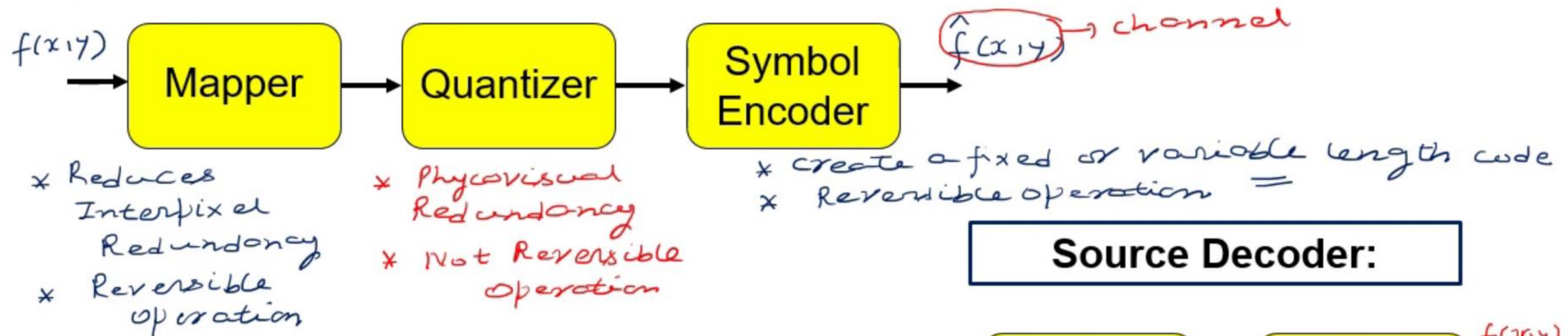




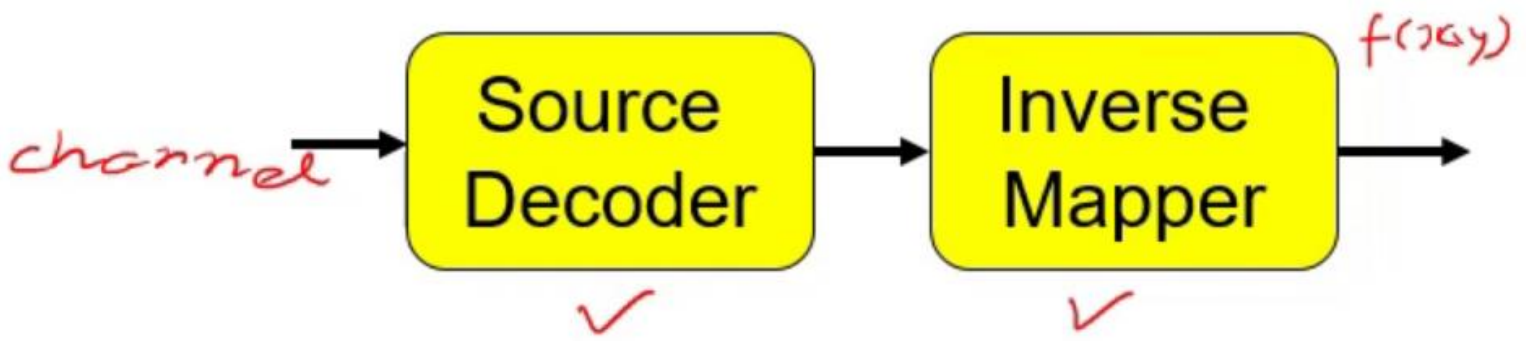
# IMAGE COMPRESSION



## Stages of encoding:



## Source Decoder:





## IMAGE SEGMENTATION

Segmentation is the process of **partitioning** a digital image into multiple regions and extracting the meaningful region which is known as **Region of Interest (ROI)**

- ✓  Region of Interest (ROI) vary with applications
- ✓  In fact no single universal segmentation algorithm exists for segmenting the ROI in all images
- ✓  Therefor many segmentation algorithms need to apply and pick that algorithm which performs the best for given requirement





# IMAGE SEGMENTATION

Image Segmentation Algorithms are based on:

✓ **Similarity Principle**  
(Region Approach)

Objective is to group pixels based on common property to extract a coherent region

✓ **Discontinuity Principle**  
(Boundary Approach)

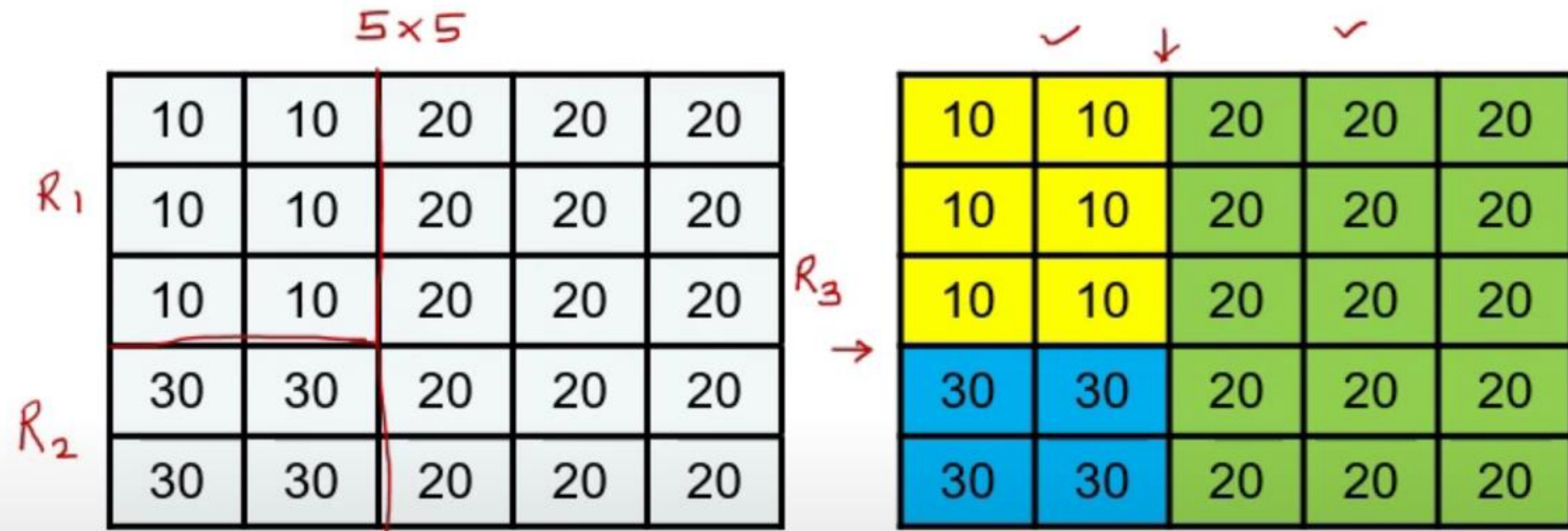
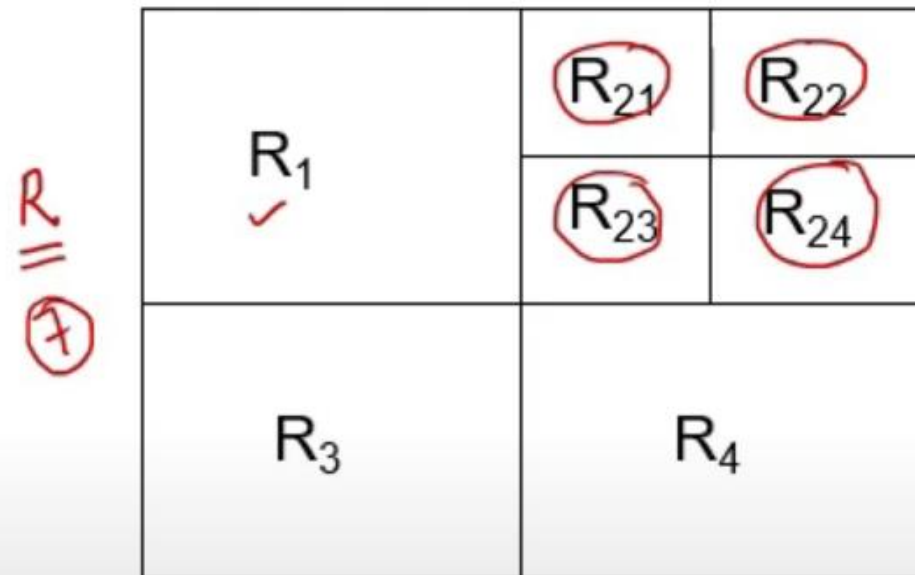
Objective is to extract regions that differ in properties like intensity, color, texture etc. ✓



# IMAGE SEGMENTATION

An image can be portioned into many regions  $R_1, R_2, R_3 \dots R_n$

Example





Thank  
you!