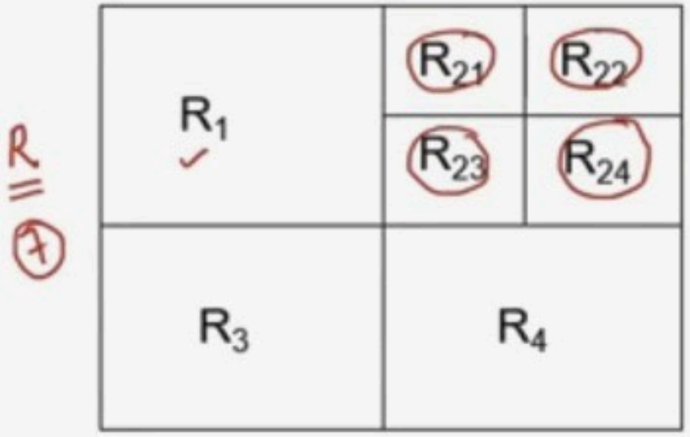
Definition of Image Segmentation

An image can be portioned into many regions R_1, R_2, R_3…R_n



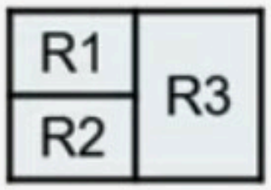
Example

5×5

10	10	20	20	20
10	10	20	20	20
10	10	20	20	20
30	30	20	20	20
30	30	20	20	20

R1 R2 R3

10	10	20	20	20
10	10	20	20	20
10	10	20	20	20
30	30	20	20	20
30	30	20	20	20



Characteristics of Segmentation Process

Let **R** represent the entire image region **and Segmentation is partitioning R** into **n** subgroups R_i

- $\bigcup_{i=1}^{n} Ri = R$ $\quad i = 1, 2, \ldots n \quad (R)$
- Ri should be connected region :i=1,2,3,……,n
- $Ri \cap R_1 = \emptyset \ (for\ all\ i\ and\ j): i \neq j$
- $P(R_i) = TRUE\ for\ i = 1,2,3, \ldots \ldots n$
- $P(R_i \cup R_j) = FALSE\ for\ i \neq j$

Here P(R_i) is a **predicate** that indicates **some property over the region**