

Example:

(i) How many numbers are there between 99 and 1000 having 7 in the unit's place?

(ii) How many numbers are there between 99 and 1000 having at least one of their digits 7?

Solution:

(i) First note that all these numbers have three digits. 7 is in the unit's place. The middle digit can be any one of the 10 digits from 0 to 9. The digit in hundred's place can be any one of the 9 digits from 1 to 9. Therefore, by the fundamental principle of counting, there are $10 \times 9 = 90$ numbers between 99 and 1000 having 7 in the unit's place.

(ii) Total number of 3 digit numbers having at least one of their digits as 7 = (Total numbers of three digit numbers) – (Total number of 3 digit numbers in which 7 does not appear at all).

$$= (9 \times 10 \times 10) - (8 \times 9 \times 9)$$

$$= 900 - 648 = 252.$$