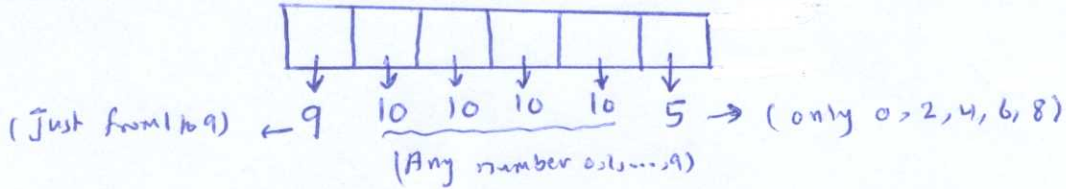


Question 4 : (6 Points)

- a. Suppose a company wants to make six-digit phone lines, for which the first digit to the left is not zero. How many even phone lines does the company have? (2 points)

Solution:



$$\begin{aligned} \text{The number of even phone lines} &= (9)(10)(10)(10)(10)(5) \\ &= 450,000 \end{aligned}$$

- b. In how many ways can 8 persons can be distributed to three rooms in a hotel where two rooms with 3 beds, and the third one with 2 beds? (2 points)

Solution:

$$n = 8, n_1 = 3, n_2 = 3, n_3 = 2$$

$$\begin{aligned} \text{The number of ways} &= \frac{8!}{3! 3! 2!} \\ &= 560 \end{aligned}$$

- c. In a 10-question examination, each question is graded right or wrong. The student gets A grade if he answered at least 8 questions, in how many ways can a student get A grade? (2 points)

Solution:

$$\begin{aligned} \text{The number of ways} &= {}^{10}C_8 + {}^{10}C_9 + {}^{10}C_{10} \\ &= \frac{10!}{8! 2!} + \frac{10!}{9! 1!} + \frac{10!}{10! 0!} \\ &= 45 + 10 + 1 = 56 \end{aligned}$$