1. Give an example of 3 events A, B, C which are pairwise independent but not independent.

Hint: find an example where whether C occurs is completely determined if we know whether

A occurred and whether B occurred, but completely undetermined if we know only one of

these things.

**Answer:**

By this we can understand that the events A, B, C are not independent as a triplet.

We can consider the following example of 3 events,

Consider, that we can throw two dice. Let A be the event that - the sum of the points is 7 , B is the event that - die 1 come up 3 , and C the event as - die 2 come up 4.

So, P(A) = P(B) = P(C)= 1/6

P(A ∩ B)= P(A ∩ C) = P(B ∩ C) = 1/36

And P(A ∩ B ∩ C) = P(B ∩ C) = 1/36

And P(A)P(B)P(C) = 1/216

Therefore, P(A ∩ B) = P(B ∩ C) = 1/36

Because, A and B has occurred same as that of B & C occurred.

2. A bag contains one marble which is either green or blue, with equal probabilities. A green

marble is put in the bag (so there are 2 marbles now), and then a random marble is taken

out. The marble taken out is green. What is the probability that the remaining marble is also

green?

**Answer:**

G= Green marble and B= Blue marble

Probability that remaining marble is also green=1, that is , consider that already present marble is blue then after taking green marble. Probability that remaining marble is green is 0

Final required probability is =1