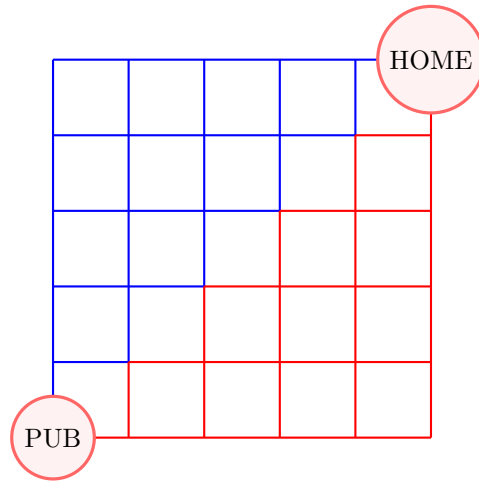# Problem Set - 1(Intro to Probability)

Mathematics Club

Summer School

Problems

1. There are 20 players in a Cricket Association each of them know at least batting or bowling. If 12 members can do batting(some of them can bowl as well) and 12 members can do bowling(some of them can bat as well). If a player is randomly chosen what is the probability that he is a all-rounder i.e., he can bat as well as bowl?

2. Sravya is angry on her boyfriend so she is throwing darts randomly to a circular board of radius $16cm$. Which is colored Red from center to $2cm$ radius, Blue from $2cm$ to $4cm$ radius, Green from $4cm$ to $8cm$ and Black from $8cm$ to $16cm$. If it hits in red Sravya's anger goes and he survives, if it hits Blue she is not going to talk for 2 days, if it hits in green she won't talk for a week if it hits black then she won't talk with him forever that is she kills him. What is the probability that Sravya kills her boyfriend?

3. Yashwanth and Rushi are playing a game that they will toss a coin and Rushi gives a chance to Yashwanth that he can choose one among the two (1)If there is atleast 1 head Yashwanth win or he can choose the other way (2) that is if there is atleast 1 head Rushi wins. Yashwanth choose (2) after trying to calculate probability by the compliment method and eliminates the choice (1) is Yashwanth's choice correct if not what would be the mistake he have committed while calcualting the probability??

4. Anjali lives in a city the map is given below. One night she went to a friend birthday party at the pub(shown in map), there she drank too much and she is going back home barely consious that she should only walk along the east and north roads only but there are theifs in the blue roads what is the probability that Anjali reaches home safely not being encountered by theifs?

5. A cycle company has 3 manufacturing units A, B, C they manufacture $20\%, 30\%$ and 50% of the total number of cycles. Of their output 3, 4 and 2 percent of cycles are defective.

   (a)If Aarav buys a cycle randomly what is the probability that the cycle is defective?

   (b)Given that Aarav got a defective cycle then what is the probability that the cycle he bought is manufactured from factory A?

6. In our workshop there are 4 machines out of which only 2 are in proper condition. If the technician comes and checks the machines one by one what is the probability that he will be able to identify the damaged machines in 2 checks?

7. A bag contains 6 balls. Two balls are drawn from it at random and both are found to be black. The probability that the bag contains at least 5 black balls is

8. Gireesh goes to class with a probability 0.9 whenever he doesn't go to class the probability that he gets a proxy is 0.3.

   (a)On any random day what is the probability that Gireesh gets his attendance?

   (b)Given that Gireesh got his attendance what is the probability that he is not present in the class?

9. Explore the the problem (that we discussed in the session) of girls and boys at OAT if there are m girls and n boys then how would the number change and probability change?

10. A doctor is called to see a sick child. The doctor has prior information that 80% of sick children in that area suffer with flu while the remaining

are suffering with measles. Assume that there is no other disease in that area. A well-known symptom of measles is a rash. From the past records, it is known that chances of having rash given that the child is suffering from measles is 0.95. However children with flu also occasionally develop rash with a chance of 0.08. If doctor finds a rash upon examining a child what is the probability that he is suffering from measles?

11. Do solve the problems given as try it yourself in the slides!!!

<div align="center">Happy Solving!</div>