R Day 4:-

1. Matrices and arrays
   a) Matrices and arrays are represented as vectors with dimensions:
      Create one matrix x with 1 to 12 numbers with 3X4 order.
   b) Create same matrix with *matrix* function.
   c) Give name of rows of this matrix with A,B,C.
   d) Transpose of the matrix.
   e) Use functions *cbind* and *rbind* separately to create different matrices.
   f) Use arbitrary numbers to create matrix.
   g) Verify matrix multiplication.

2. Random sampling
   a) In R, you can simulate these situations with the *sample* function. Pick five numbers at random from the set 1:40.

   b) Notice that the default behaviour of *sample* is *sampling without replacement*. That is, the samples will not contain the same number twice, and size obviously cannot be bigger than the length of the vector to be sampled. If you want sampling with replacement, then you need to add the argument *replace=TRUE*.
      Sampling with replacement is suitable for modelling coin tosses or throws of a die. So, for instance, simulate 10 coin tosses.

   c) In fair coin-tossing, the probability of heads should equal the probability of tails, but the idea of a random event is not restricted to symmetric cases. It could be equally well applied to other cases, such as the successful outcome of a surgical procedure. Hopefully, there would be a better than 50% chance of this. Simulate data with nonequal probabilities for the outcomes (say, a 90% chance of success) by using the *prob* argument to sample.

   d) The *choose* function can be used to calculate the following express.

$$\binom{40}{5} = \frac{40!}{5!35!}$$

   e) Find 5!