Erdös Renyi Graph $G(n,p)$ is constructed in the following manner:

1. Consider n vertices labeled $\{1,2,\ldots,n\}$.

2. Corresponding to each distinct pair $\{i,j\}$ we perform an independent Bernoulli (p) experiment and insert an edge between i and j with probability p. Note that all edges are *undirected* and hence there are total of $\binom{n}{2}$ possible edges, each occuring with probability p.

3. In this group worksheet you will simulate an Erdös Renyi Graph and find the M.L.E. for the relevant p. Your groups are available at:

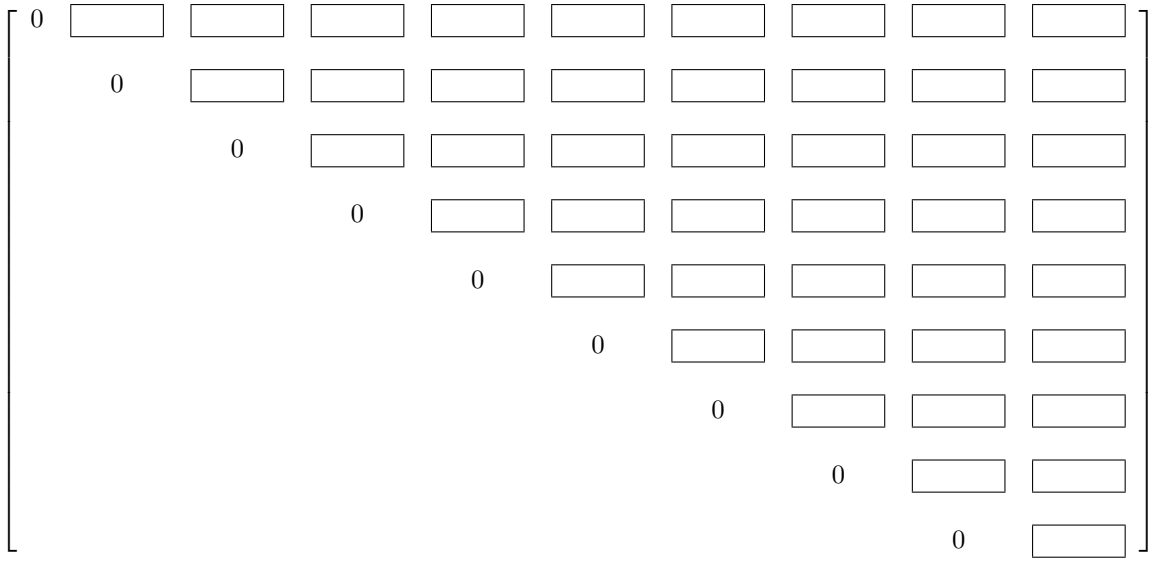
https://docs.google.com/spreadsheets/d/1dqH5BvvYID43fK0Syx29CMFvo4hlyQvDcg0iReaO-Ns/edit?usp=sharing

1. Choosing x: Write a simple R-code to generate a number uniformly from $\{1,2,3,4,5\}$. Let x denote the chosen number. Record x in the box: .
2. Consider the experiment of rolling a die and (choose) specify an event from that experiment which occurs with probability $x/6$. *All three persons together* decide on that event, and let it be called B. Write out the description of the event B in the box below:

   .
3. The set of vertices for the graph you are about to construct are $\{1,2,\ldots,10\}$. The graph has no self-edges (i.e Self-loops). What is the total number of possible edges ?

   Record answer in the box:
4. Construct the *random* adjacency matrix A for the graph as follows. For each pair $1 \le i < j \le 10$:
   (a) Roll your die(using one at home or at http://www.randomservices.org/random/apps/Dice.html) and observe if the event B has occured.
   (*Take turns with each person Rolling the die 15 times.*)
   (b) Designate
   $$a_{ij} = \begin{cases} 1 & \text{if } B \text{ occured.} \\ 0 & \text{if } B \text{ did not occur} \end{cases}$$

All three persons in respective sheets fill in the matrix entries accordingly:



5. Using the `igraph` package draw the random graph , denote by $G(10, \frac{x}{6})$, corresponding to the above adjacency matrix (i.e draw an edge between i and j if $a_{ij} = 1$).