Lab 6

1 Task 6.1

Write a program which for a given graph $G = (V, E)$ finds a maximal Independent Set in it.

You can implement a simple greedy algorithm which is based on the idea of starting with an empty set I, picking vertices from G one by one and adding them to I if I continues to be an independent set.

Algorithm 1: Maximal Independent Set

Input : Adjacency matrix A
Output: A subset of vertices I

$P :=$ a random permutation of vertices V;
$I := \varnothing$;
for $i = 1$ ***TO*** *length(P)* **do**
  $T := I \cup P(i)$;
  if T *is an Independent Set* **then**
    $I := I \cup P(i)$;
  end
end

Hint 1: To find a random permutation of vertices of G you can use the following command:

```
P = randperm(size(A, 1));
```

Hint 2: You can use the routine from the task 5.1 to check whether a subset of vertices T is an independent set.