



INDIAN INSTITUTE OF TECHNOLOGY TIRUPATI
DEPARTMENT OF MATHEMATICS AND STATISTICS
MA5191 - PROGRAMMING LABORATORY

Lab Project - VIII - RSA Library

I MSc (Mathematics and Statistics)
SEMESTER II

Max. MARKS: 500
Submission Date: 21 March 2021

Cryptography Scientific Project

Write a Python program to implement the RSA encryption and decryption

1. Get two large prime numbers p and q .
2. Find $n = pq$.
3. Compute the Euler totient function $\phi(n) = (p - 1)(q - 1)$
4. Choose an integer e such that $\gcd(\phi, e) = 1$ and $1 < e < \phi(n)$
5. Choose an integer d such that $\gcd(de, \phi(n)) = 1$
6. Fix e and find as many d as possible and fill the first row of the matrix.
7. Change and e and find once again as many d as possible and fill the next row of the matrix
8. Find the entire matrix.
9. For more details, check
<https://engineering.purdue.edu/kak/compsec/NewLectures/Lecture12.pdf>

Gaming Project

Write a Magic Hexagon Puzzle Game using Python Language

1. Get the number of rows required in the magic hexagon (preferably less than 10).
2. Get the total sum required from the user.
3. Get the starting and ending values from the user for the magic hexagon.
4. Check the possibility to generate the magic hexagon for the above conditions.

5. If it is possible to generate the magic square, generate and display the magic hexagon.
6. Further, display the possible combinations of the magic hexagon.
7. For more details: https://en.wikipedia.org/wiki/Magic_hexagon