**Report File**

Question 1.

For n = 30, 31, 8893, 12200, 987654323 and 131317171919, the results according to my program are: 2 3 5, 31, 8893, 2 2 2 5 5 61 and 19 19 101 3601579, respectively.

Question 2.

For (a, b) = (123456, 321), (-123456, 321), (123456, -321), (-123456, -321), the quotient and remainder according to my program are: (384, 192), (-385, 129), (-384, 192) and (385, 129) respectively.

Question 3 Part 1.

For a = 8,359, b = 4,962, the gcd = 1, x = -1877 and y = 3162.

For a = 95,243, b = 24,138, the gcd = 1, x = 461 and y = -1819.

Question 3 Part 2.

As the gcd for part 1 is 1, the decryption system is valid. Therefore, for n = p × q = 701 × 1051 and e = 487, the smallest possible decryption key = 232423.

Question 4.

For 𝐴 = [ 7.5 −1.5 −4.75 −4 1 2.5 −2.5 0.5 1.75], the inverse of the matrix =

2 1 4

3 5 1

2 0 6