

Protocol with RSA (Est. time 2h)

RSA Algorithm

Key Generation

Select p, q	p and q , both prime; $p \neq q$
Calculate $n = p \times q$	
Calculate $\phi(n) = (p-1)(q-1)$	
Select integer e	$\gcd(\phi(n), e) = 1; 1 < e < \phi(n)$
Calculate d	$de \bmod \phi(n) = 1$
Public key	$KU = \{e, n\}$
Private key	$KR = \{d, n\}$

Encryption

Plaintext:	$M < n$
Ciphertext:	$C = M^e \bmod n$

Decryption

Plaintext:	C
Ciphertext:	$M = C^d \bmod n$

TASK

Let the two End-Users Alice and Bob establish a connection.

Create two files, one for Alice and one for Bob, send the message "Hello world" from Alice to Bob using the protocol above. The means they use to communicate is up to you (socket, etc...). Show the evolution of the message to cipher and back to message