Cyber Security Fundamentals

Assignment 2:

Overview: Use the openssl command-line tool to generate an RSA key pair (public and private key). Export the keys and display them in PEM format.

Step 1: Open Your Terminal or Command Prompt

Make sure OpenSSL is installed and accessible. Type:

openssl version

You should see the OpenSSL version displayed.

Step 2: Generate the Private Key

Run the following command to generate a 2048-bit RSA private key and save it in private_key.pem:

openssl genrsa -out private_key.pem 2048

Step 3: Generate the Public Key from the Private Key

Create the public key public_key.pem with this command:

openssl rsa -in private_key.pem -pubout -out public_key.pem

Step 4: Verify the Private Key (View the PEM Format)

Display the private key file contents:

cat private_key.pem

Your output will begin with:

-----BEGIN RSA PRIVATE KEY-----

Step 5: Verify the Public Key (View the PEM Format)

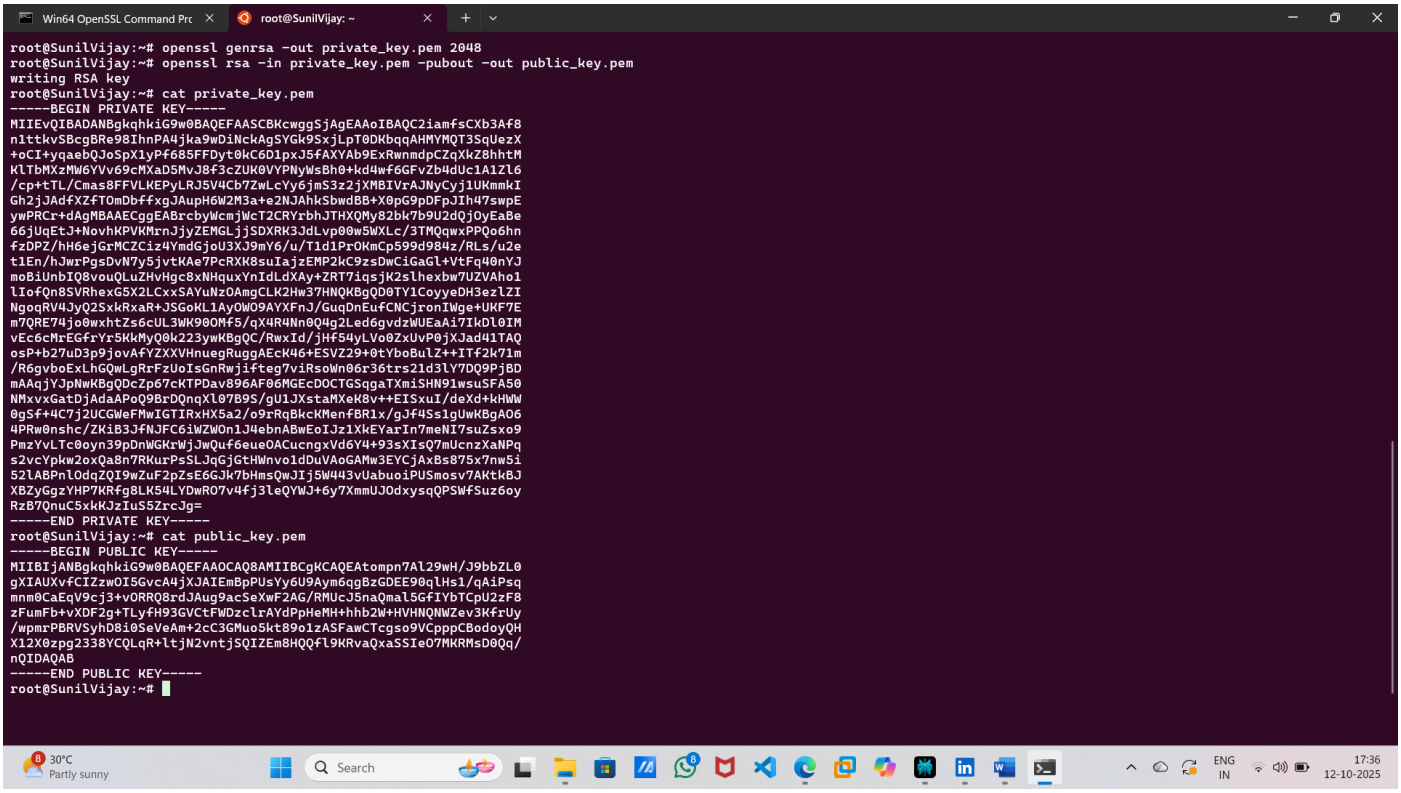
Display the public key file contents:

cat public_key.pem

Your output will begin with:

text

-----BEGIN PUBLIC KEY-----


Win64 OpenSSL Command Prc
root@SunilVijay: ~
root@SunilVijay:~# openssl genrsa -out private_key.pem 2048
root@SunilVijay:~# openssl rsa -in private_key.pem -pubout -out public_key.pem
writing RSA key
root@SunilVijay:~# cat private_key.pem
-----BEGIN PRIVATE KEY-----
MIIEvQIBADANBgkqhkiG9w0BAQEFAASCBKcwggSjAgEAAoIBAQC2iamfsCXb3Af8
n1ttkvSBcgBRe98IhnPA4jka9wDiNckAgSYGk9SxjLpT0DKbqqAHMYMQT3SqUezX
+oCI+yqaebQJoSpX1yPf685FFDyt0kC6D1pxJ5fAXYAb9ExRwnmdpCZqXkZ8hhtM
KlTbMXzMW6YVv69cMXaD5MvJ8f3czZUK0VYPNyWsBh0+kd4wf6GFvZb4dUc1A1Zl6
/cp+tTL/Cmas8FFVLKEPyLRJ5V4Cb7ZwLcYy6jmS3z2jXMBIVrAJNyCyj1UKmmkI
Gh2jJAdfXZfTOmDbffxgJAupH6W2M3a+e2NJAhkSbwdBB+X0pG9pDFpJIh47swpE
ywPRCr+dAgMBAAECggEABrcbyWcmjWcT2CRYrbhJTHXQMy82bk7b9U2dQjOyEaBe
66jUqEtJ+NovhKPVKMrnJjyZEMGLjjSDXRK3JdLvp00w5WXLc/3TMQqwxPPQo6hn
fzDPZ/hH6ejGrMCZCiz4YmdGjoU3XJ9mY6/u/T1d1PrOKmCp599d984z/RLs/u2e
t1En/hJwrPgsDvN7y5jvtKAe7PcRXK8suIajzEMP2kC9zsDwCiGaGl+VtFq40nYJ
moBiUnbIQ8vouQLuZHvHgc8xNHquxYnIdLdXAy+ZRT7iqsjK2slhexbw7UZVAho1
lIofQn8SVRhexG5X2LCxxSAYuNzOAmgCLK2Hw37HNQKBgQD0TY1CoyyeDH3ezlZI
NgoqRV4JyQ2SxkRxaR+JSGoKL1AyOWO9AYXFnJ/GuqDnEufCNCjronIWge+UKF7E
m7QRE74jo0wxhtZs6cUL3WK90OMf5/qX4R4Nn0Q4g2Led6gvdzWUEaAi7IkDl0IM
vEc6cMrEGfrYr5KkMyQ0k223ywKBgQC/RwxId/jHf54yLVo0ZxUvP0jXJad41TAQ
osP+b27uD3p9jovAfYZXVHnuegRuggAEcK46+ESVZ29+0tYboBulZ++ITf2k71m
/R6gvboExLhGQwLgRrFzUoIsGnRwjifteg7viRsoWn06r36trs21d3lY7DQ9PjBD
mAAqjYJpNwKBgQDcZp67cKTPDav896AF06MGEcDOCTGSqgaTXmiSHN91wsuSFA50
NMxvxGatDjAdaAPoQ9BrDQnqXl07B9S/gU1JXstaMXeK8v++EISxuI/deXd+kHWW
0gSf+4C7j2UCGWeFMwIGTIRxHX5a2/o9rRqBkcKMenfBR1x/gJf4Ss1gUwKBgAO6
4PRw0nshc/ZKiB3JfNJFC6iWZWOn1J4ebnABwEoIJz1XkEYarIn7meNI7suZsxo9
PmzYvLTc0oyn39pDnWGKrWjJwQuf6eueOACucngxVd6Y4+93sXIsQ7mUcnzXaNPq
s2vcYpkw2oxQa8n7RKurPsSLJqGjGtHWnvo1dDuVAoGAMw3EYCjAxBs875x7nw5i
52lABPnlOdqZQI9wZuF2pZsE6GJk7bHmsQwJIj5W443vUabuoiPUSmosv7AKtkBJ
XBZyGgzYHP7KRfg8LK54LYDwRO7v4fj3leQYWJ+6y7XmmUJOdxysqQPSWfSuz6oy
RzB7QnuC5xkKJzIuS5ZrcJg=
-----END PRIVATE KEY-----
root@SunilVijay:~# cat public_key.pem
-----BEGIN PUBLIC KEY-----
MIIBIjANBgkqhkiG9w0BAQEFAAOCAQ8AMIIBCgKCAQEAtompn7Al29wH/J9bbZL0
gXIAUXvfCIZzwOI5GvcA4jXJAIEmBpPUsYy6U9Aym6qgBzGDEE90qlHs1/qAiPsq
mnm0CaEqV9cj3+vORRQ8rdJAug9acSeXwF2AG/RMUcJ5naQmal5GfIYbTCpU2zF8
zFumFb+vXDF2g+TLyfH93GVCtFWDzclrAYdPpHeMH+hhb2W+HVHNQNWZev3KfrUy
/wpmrPBRVSyhD8i0SeVeAm+2cC3GMuo5kt89o1zASFawCTcgso9VCpppCBodoyQH
X12X0zpg2338YCQLqR+ltjN2vntjSQIZEm8HQQfl9KRvaQxaSSIeO7MKRMsD0Qq/
nQIDAQAB
-----END PUBLIC KEY-----
root@SunilVijay:~#
30°C
Partly sunny
Search
ENG
IN
17:36
12-10-2025