

```
student@student-Vostro-3800: ~/Desktop
File Edit View Search Terminal Help
student@student-Vostro-3800:~$ cd Desktop
student@student-Vostro-3800:~/Desktop$ ls
mc 'py rep.pdf' 'python final ppt(1).pptx'
student@student-Vostro-3800:~/Desktop$ mkdir A
student@student-Vostro-3800:~/Desktop$ mkdir B
student@student-Vostro-3800:~/Desktop$ ls
A B mc 'py rep.pdf' 'python final ppt(1).pptx'
student@student-Vostro-3800:~/Desktop$
```

```
Terminal Thu 14:04
student@student-Vostro-3800: ~/Desktop/A
File Edit View Search Terminal Help
student@student-Vostro-3800:~/Desktop/A$

student@student-Vostro-3800: ~/Desktop/B
File Edit View Search Terminal Help
student@student-Vostro-3800:~/Desktop/B$
```

```
Terminal Thu 14:03
student@student-Vostro-3800: ~/Desktop/A
File Edit View Search Terminal Help
student@student-Vostro-3800:~$ clear

student@student-Vostro-3800:~$ cd Desktop
student@student-Vostro-3800:~/Desktop$ ls
mc 'py rep.pdf' 'python final ppt(1).pptx'
student@student-Vostro-3800:~/Desktop$ mkdir A
student@student-Vostro-3800:~/Desktop$ mkdir B
student@student-Vostro-3800:~/Desktop$ ls
A B mc 'py rep.pdf' 'python final ppt(1).pptx'
student@student-Vostro-3800:~/Desktop$ cd A
student@student-Vostro-3800:~/Desktop/A$

student@student-Vostro-3800: ~
File Edit View Search Terminal Help
student@student-Vostro-3800:~$
```

```
s Terminal
Thu 14:04
student@student-Vostro-3800: ~/Desktop/A
File Edit View Search Terminal Help
student@student-Vostro-3800:~$ clear
student@student-Vostro-3800:~$ cd Desktop
student@student-Vostro-3800:~/Desktop$ ls
mc 'py rep.pdf' 'python final ppt(1).pptx'
student@student-Vostro-3800:~/Desktop$ mkdir A
student@student-Vostro-3800:~/Desktop$ mkdir B
student@student-Vostro-3800:~/Desktop$ ls
A B mc 'py rep.pdf' 'python final ppt(1).pptx'
student@student-Vostro-3800:~/Desktop$ cd A
student@student-Vostro-3800:~/Desktop/A$

student@student-Vostro-3800:~/Desktop/A$ openssl genrsa -out keypairA.pem 2048
Generating RSA private key, 2048 bit long modulus (2 primes)
.....+++++
e is 65537 (0x010001)
student@student-Vostro-3800:~/Desktop/A$ cat keypairA.pem
-----BEGIN RSA PRIVATE KEY-----
MIIEpAIBAAKCAQEAuV64ey4IuJbX9Uk/rpEK5sd8X5S5zhMRZgUChnJ8wAeCoJ
7xih3cv4ItIAY7DNk8PMReJYLdN0dJzyaw3GM3FIdGFz1K3dnKr9yf2X8I93cryS
KVUdlS+JfOn0Rrxqg96q2Q91xf1KPKfDsDNYfucvD8xj5w0gqV2k25gQpJ33Tla/
usy9JexKNB4t0CQ60+EfC8x8hJzwDjse9oEpaHf7EIAktpZ0KznHwsm03eyLdcS+
blzCRKT6uu05JPXu+d727BorIpbV07YAlj9p15xtVJ11zBHOq1rNhPWhp6R511L
zRuc7F5h8L3SBCuZPkDz9Y/hbnuTwwYMA7CoxwIDAQABAoIBABzMsJDCucwLk2TC
orrIqaq0sNRATEU++lEdg6V27xXpFDLZyG0i+TZacc1xUW3xFI+xM/euKB2B9PN
Q/2J6E85vG5J3D3vtF07f6iQlucNwplY3G2Y8iRtPKBMNVhwF/IV8ZMLQehXGonAG
DJVBhPBBDfIkDMROQ/XMrPDtMktv9GL9/UHtnS/jyzIZWe1AYyeNUK47yP8y87
QxYXXCIxIJSgPSH/PjgesXTJfe19Nkl+lbwec8PcRLQaByIPJpnL+yYtkuH12nQ08
5PpEPu4kivxUoKlFuLTwH4RaEV+6XFBMCCG3I297kclen+re07QRuFON9Lb58NHL
JMZ9MLCgYEA2nuz+js0EV7BRaoAEmbhL07qGZlXNeGeSAKX8963F/UI48AjTcQk
BZXVR0dL7nM4d7IIS5TJW7DeRCGeGc1U17DrRVqu1bh4/ONoqZHR0dXgVAVQ47
c/ut+u4ZIZxGpzPxcLcucbz7hesj10xdumIDSI/W5nYDgHV/2Nn+E0CgYEA2TNL
F+o/RfYn6REMj9MzN5qK3CgWuF19LmZnNoyDQec1QY8l15JnHavLznzrUdomYzoJ
PTJNif6hS1w9CsqalRESblt50w2cp0Ti7hfZ7wDQZSblq58tPvtVPSNL4YfVCTn
wZjyN/EbuZJlq0vbcgmftisBE0VDLHGf8F5beVsCgYEA0ypoo1v1uZZVfB15BFAn
i3j3DLJERN2ry+ulzfDezm+YbfffQp2MBpdxRTRk27aazVKShiakQ+MBKEYLlVMrP
o2TLf0tJ5HNtNJK7V6AWJ4SPULSENvtsPodTVM5MURnoN8a+fsCtXQRw3dIMG4m5
00MvWfJv5KsncDJAeQKVKKcgYBCTVoJXy1BFwvchvu4ch/5n5JYKp814XF5Uib
/yYJK0BSWuyVQ0xZJKGrypepU9nFL43ern9ckrtY8WCI4qIEvrUbiPeh/yT8a9X
a45V20Qna0f8WGLm0jWouBvN4nnRwnYxmQ7Znq7NgnWFIUL1nnTBSRQA8BTFrg
C0LP2wK8gQC/sRNH+V9H1/OeuHu8SLDysJhxxkhpA+UEQCqJl7dx3WESFGg96g
nCDhj3nB8IdEkv3k2T7Xymh40BXYT0IE8gTCRE1EQ50xpxCIGwfPBWmmNb2777TV
t2nF+p5LuL+y7na14z+k9n/HhQDxJRTp3mdxuIPp2zrBqhu3XldiQ==
-----END RSA PRIVATE KEY-----

student@student-Vostro-3800:~/Desktop/A
File Edit View Search Terminal Help
F+o/RfYn6REMj9MzN5qK3CgWuF19LmZnNoyDQec1QY8l15JnHavLznzrUdomYzoJ
PTJNif6hS1w9CsqalRESblt50w2cp0Ti7hfZ7wDQZSblq58tPvtVPSNL4YfVCTn
wZjyN/EbuZJlq0vbcgmftisBE0VDLHGf8F5beVsCgYEA0ypoo1v1uZZVfB15BFAn
i3j3DLJERN2ry+ulzfDezm+YbfffQp2MBpdxRTRk27aazVKShiakQ+MBKEYLlVMrP
o2TLf0tJ5HNtNJK7V6AWJ4SPULSENvtsPodTVM5MURnoN8a+fsCtXQRw3dIMG4m5
00MvWfJv5KsncDJAeQKVKKcgYBCTVoJXy1BFwvchvu4ch/5n5JYKp814XF5Uib
/yYJK0BSWuyVQ0xZJKGrypepU9nFL43ern9ckrtY8WCI4qIEvrUbiPeh/yT8a9X
a45V20Qna0f8WGLm0jWouBvN4nnRwnYxmQ7Znq7NgnWFIUL1nnTBSRQA8BTFrg
C0LP2wK8gQC/sRNH+V9H1/OeuHu8SLDysJhxxkhpA+UEQCqJl7dx3WESFGg96g
nCDhj3nB8IdEkv3k2T7Xymh40BXYT0IE8gTCRE1EQ50xpxCIGwfPBWmmNb2777TV
t2nF+p5LuL+y7na14z+k9n/HhQDxJRTp3mdxuIPp2zrBqhu3XldiQ==
-----END RSA PRIVATE KEY-----
student@student-Vostro-3800:~/Desktop/A$ ^C
student@student-Vostro-3800:~/Desktop/A$ openssl rsa -in keypairA.
pem -text RSA Private-Key: (2048 bit, 2 primes)
bash: syntax error near unexpected token `('
student@student-Vostro-3800:~/Desktop/A$ openssl rsa -in keypairA.
pem -text RSA Private-Key:
rsa: Use -help for summary.
student@student-Vostro-3800:~/Desktop/A$ openssl rsa -in keypairA.
pem -text RSA Private-Key: (2048 bit, 2 primes)
bash: syntax error near unexpected token `('
student@student-Vostro-3800:~/Desktop/A$ openssl rsa -in keypairA.
pem -text RSA Private-Key: 2048 bit, 2 primes
rsa: Use -help for summary.
student@student-Vostro-3800:~/Desktop/A$ -help
Command '-help' not found, did you mean:
command 'dhelp' from deb dhelip
Try: sudo apt install <deb name>
student@student-Vostro-3800:~/Desktop/A$ openssl rsa -in keypairA.
pem -pubout -out publicA.pem
writing RSA key

student@student-Vostro-3800:~/Desktop/B
File Edit View Search Terminal Help
student@student-Vostro-3800:~/Desktop/B$ openssl genrsa -out keypairB.pem 2048
Generating RSA private key, 2048 bit long modulus (2 primes)
.....+++++
e is 65537 (0x010001)
student@student-Vostro-3800:~/Desktop/B$ cat keypairB.pem
-----BEGIN RSA PRIVATE KEY-----
MIIEpAIBAAKCAQEA8zfc0QXbef0i3wpzYLYK4A6PASfZJ2LAMA5MrKYEsNGpdX4z
/sntD+cdvBddnnbjDMeHbPc/8PXyxt8Q002vIVhiVRW02LiPqSnmS1611EtE5h+R
tdm6+/EaLgwuM0yhclL5ysa90h0d4dTWq00Pfc2sJRYxokOhd3Lh8DW1vsYsECP2v
vL2lQU3CtzcjY180y2AcGlycoRl7v81GQF3gwyUxoC0WAnQWQFRN8ez89NCm6zC+
r5fDPCZpv0B0DRmY66cZqvQlQY042LdJDNpVjkrDofr57a3FCXuAYTZPt6RpFRAo
ttLTWu2KBav6Gkry/CphNbM8boY3kdz+psLpCQIDAQABAoIBAC3czNDFb/ty1k6E
o/kMmsZh0GoYKqS13hsAKQktTRkiJ/gcQ+W5ofArvpnmNkoZVPSl7M2JWg9P8XW6
vLBSp8F77x7oNu/e7YgSj6k+br8XamLSb2GBKxczAaLJPTSQimi+InAMpUzvr2o6
slz2jJcVezX30fmsTzDtpC7QCKUHLXsVjootWoPE+Zc1TyXUPAhgSwIGS0xBSU
anVC0lTBKzMG0/qUfhrDqMoVdCLCoAFBRN6cx93zljclE00PqMenbt9pK1GVXNk
1mCaTxsLuwn7Xo35IKumsjYnOPs7+gqKHkiYo/8PgpAjqsz2dVuzTeL+IP0cj
Iz8KcxKcgYEA/VTqNgqHpfM/hlaBKCJzNI9i9+7nrqeoNt9g5vzTT+8pIVjDZdxo
44mVCw40uUiaie5+o16FgHh21BLHxWlQYmhotFUECR5CBIZLYCUCGSQdKQJfaxg
TdhIrVrs7KLz0aEBWfe/cod0Ba9H60eEwz7EEjb9j9SEWPSN0zEQEVMCGYEA9cet
eBv71x7MHS0m928KN32A5JbnDvo080y4ubtLiCilAnKfmfJQwZLkX5H+XybtBz
ljHlDAN6K+XC/KigXQ0+LFrcRNzXMF1Xel8049HHqKQuFvHITW5zVh0g88R/C
sFrmXq9Udri9/5ln7BILs0Si83/1T0P1ccIhLMCGYEAoejJoCxusOm76eNnMh6X
vvn9lPSaPiI/DkcV8UY0R3LrdJrYAjuyMhAB8bwj60B/1Sgmq0UMc1WL3NL79v1
L9m9f7BGCPEU5KecjPBXcmkrokDNCBNJobcgDSANjEok67RQ03vYe1/X+OcfjMU6
0XbM24YJpg3XYH9KQjXU5p0CgYBh9Ntma4DMFDI1zXStiUwBIwLXx9oEMC6j3BD
btZiUX/MP80QJBUQbup1tVeJjw/c12eRPQG+Y0RmCoTU06m6aKukZT11W/Y2nFUG
PlmCtRzAwDgyZ/TH96SQd3D0mVhrg3iS9hVFHwNDUQEGssqg2a1dHdLGSbdz1Bp
iSIRKQKBgQCYi7c04c6IowhgIwJlFHFpPAVF898DLtSSJufAaWGFg3eZVkmK0Bw
Obqe6PBuQ+QzW5/IOGRFTZm12aYXJ8VWLCliGnk50hR7ato/4p/7MWzwt0IMdbfE
+tv8/oooghQsTMRFGhmw/Oek3RZc4L681uqWLSjfi1BIGH4Ywq0PQO==
-----END RSA PRIVATE KEY-----

student@student-Vostro-3800:~/Desktop/B
File Edit View Search Terminal Help
.....+++++
e is 65537 (0x010001)
student@student-Vostro-3800:~/Desktop/B$ cat keypairB.pem
-----BEGIN RSA PRIVATE KEY-----
MIIEpAIBAAKCAQEA8zfc0QXbef0i3wpzYLYK4A6PASfZJ2LAMA5MrKYEsNGpdX4z
/sntD+cdvBddnnbjDMeHbPc/8PXyxt8Q002vIVhiVRW02LiPqSnmS1611EtE5h+R
tdm6+/EaLgwuM0yhclL5ysa90h0d4dTWq00Pfc2sJRYxokOhd3Lh8DW1vsYsECP2v
vL2lQU3CtzcjY180y2AcGlycoRl7v81GQF3gwyUxoC0WAnQWQFRN8ez89NCm6zC+
r5fDPCZpv0B0DRmY66cZqvQlQY042LdJDNpVjkrDofr57a3FCXuAYTZPt6RpFRAo
ttLTWu2KBav6Gkry/CphNbM8boY3kdz+psLpCQIDAQABAoIBAC3czNDFb/ty1k6E
o/kMmsZh0GoYKqS13hsAKQktTRkiJ/gcQ+W5ofArvpnmNkoZVPSl7M2JWg9P8XW6
vLBSp8F77x7oNu/e7YgSj6k+br8XamLSb2GBKxczAaLJPTSQimi+InAMpUzvr2o6
slz2jJcVezX30fmsTzDtpC7QCKUHLXsVjootWoPE+Zc1TyXUPAhgSwIGS0xBSU
anVC0lTBKzMG0/qUfhrDqMoVdCLCoAFBRN6cx93zljclE00PqMenbt9pK1GVXNk
1mCaTxsLuwn7Xo35IKumsjYnOPs7+gqKHkiYo/8PgpAjqsz2dVuzTeL+IP0cj
Iz8KcxKcgYEA/VTqNgqHpfM/hlaBKCJzNI9i9+7nrqeoNt9g5vzTT+8pIVjDZdxo
44mVCw40uUiaie5+o16FgHh21BLHxWlQYmhotFUECR5CBIZLYCUCGSQdKQJfaxg
TdhIrVrs7KLz0aEBWfe/cod0Ba9H60eEwz7EEjb9j9SEWPSN0zEQEVMCGYEA9cet
eBv71x7MHS0m928KN32A5JbnDvo080y4ubtLiCilAnKfmfJQwZLkX5H+XybtBz
ljHlDAN6K+XC/KigXQ0+LFrcRNzXMF1Xel8049HHqKQuFvHITW5zVh0g88R/C
sFrmXq9Udri9/5ln7BILs0Si83/1T0P1ccIhLMCGYEAoejJoCxusOm76eNnMh6X
vvn9lPSaPiI/DkcV8UY0R3LrdJrYAjuyMhAB8bwj60B/1Sgmq0UMc1WL3NL79v1
L9m9f7BGCPEU5KecjPBXcmkrokDNCBNJobcgDSANjEok67RQ03vYe1/X+OcfjMU6
0XbM24YJpg3XYH9KQjXU5p0CgYBh9Ntma4DMFDI1zXStiUwBIwLXx9oEMC6j3BD
btZiUX/MP80QJBUQbup1tVeJjw/c12eRPQG+Y0RmCoTU06m6aKukZT11W/Y2nFUG
PlmCtRzAwDgyZ/TH96SQd3D0mVhrg3iS9hVFHwNDUQEGssqg2a1dHdLGSbdz1Bp
iSIRKQKBgQCYi7c04c6IowhgIwJlFHFpPAVF898DLtSSJufAaWGFg3eZVkmK0Bw
Obqe6PBuQ+QzW5/IOGRFTZm12aYXJ8VWLCliGnk50hR7ato/4p/7MWzwt0IMdbfE
+tv8/oooghQsTMRFGhmw/Oek3RZc4L681uqWLSjfi1BIGH4Ywq0PQO==
-----END RSA PRIVATE KEY-----
student@student-Vostro-3800:~/Desktop/B$ openssl rsa -in keypairB.pem -pubo
ut -out publicB.pem
writing RSA key
student@student-Vostro-3800:~/Desktop/B$
```

```
student@student-Vostro-3800: ~/Desktop/A
File Edit View Search Terminal Help
/yYjKOBsWuyVQ0xZJKGrycepU9nfl43ern9ckrtY8WCI4qIEvrUblpYEH/yt8a9X
a45V20Qna0f8WGLn0jW0uBVN4mnRwnYzxmQ7zNq7nGnWFIU1lnmTBSRQA8BtFrg
C0LPZwKB8QC/sRNH+V9hI/OeuHU8SLDysJhXkhh6pA+UEQCqJp17dx3WESFG9g6
nCDhJ3nB8ldEKv3k277Yymh40BXTY0IE8gTCRE1EQ50xpxCIGwFPBWmNb2777TV
t2nF+p5LUL+y7na14z+k9n/HhQ0xJ3Rtp3ndxu1Pp2zrbQhu3XldIQ=
-----END RSA PRIVATE KEY-----
student@student-Vostro-3800:~/Desktop/A$ ^C
student@student-Vostro-3800:~/Desktop/A$ openssl rsa -in keypairA.
pem -text RSA Private-Key: (2048 bit, 2 primes)
bash: syntax error near unexpected token `('
student@student-Vostro-3800:~/Desktop/A$ openssl rsa -in keypairA.
pem -text RSA Private-Key:
rsa: Use -help for summary.
student@student-Vostro-3800:~/Desktop/A$ openssl rsa -in keypairA.
pem -text RSA Private-Key: (2048 bit, 2 primes)
bash: syntax error near unexpected token `('
student@student-Vostro-3800:~/Desktop/A$ openssl rsa -in keypairA.
pem -text RSA Private-Key: 2048 bit, 2 primes
rsa: Use -help for summary.
student@student-Vostro-3800:~/Desktop/A$ -help
Command '-help' not found, did you mean:
  command 'dhel' from deb dhel
Try: sudo apt install <deb name>
student@student-Vostro-3800:~/Desktop/A$ openssl rsa -in keypairA.
pem -pubout -out publicA.pem
writing RSA key
student@student-Vostro-3800:~/Desktop/A$ ls
keypairA.pem  publicA.pem
student@student-Vostro-3800:~/Desktop/A$ gedit msgA.txt
student@student-Vostro-3800:~/Desktop/A$ cat msgA.txt
This is the message from A to B
Hi B how are you ?

student@student-Vostro-3800:~/Desktop/B$ openssl rsa -in keypairB.pem -pubo
ut -out publicB.pem
writing RSA key
student@student-Vostro-3800:~/Desktop/B$ ls
keypairB.pem  publicB.pem
student@student-Vostro-3800:~/Desktop/B$ gedit msgB.txt
student@student-Vostro-3800:~/Desktop/B$ cat msgB.txt
This is the message from B to A
A how are you ?
student@student-Vostro-3800:~/Desktop/B$
```

```
ubuntu@ubuntu-VirtualBox:~/Desktop/A$ ls
keypairA.pem  msgA.txt  publicA.pem
ubuntu@ubuntu-VirtualBox:~/Desktop/A$ cp publicA.pem /home/ubuntu/Desktop/B/publicA.pem
ubuntu@ubuntu-VirtualBox:~/Desktop/A$ ls
keypairA.pem  msgA.txt  publicA.pem  publicB.pem
ubuntu@ubuntu-VirtualBox:~/Desktop/A$ openssl rsautl -encrypt -in msgA.txt -out emsgA.txt -inkey publ
icB.pem -pubin
ubuntu@ubuntu-VirtualBox:~/Desktop/A$ ls
emsgA.txt  keypairA.pem  msgA.txt  publicA.pem  publicB.pem
ubuntu@ubuntu-VirtualBox:~/Desktop/A$ cp emsgA.txt /home/ubuntu/Desktop/B/emsgA.txt
ubuntu@ubuntu-VirtualBox:~/Desktop/A$ ls
emsgA.txt  emsgB.txt  keypairA.pem  msgA.txt  publicA.pem  publicB.pem
ubuntu@ubuntu-VirtualBox:~/Desktop/A$ openssl rsautl -decrypt -in emsgB.txt -out dmsgB.txt -inkey key
pairA.pem
ubuntu@ubuntu-VirtualBox:~/Desktop/A$ cat emsgB.txt
nOtX0000j0H000
000{*C00000z0V000[KD&000{00$00g00I00$aw000g,0AD"! .iz\00
000)0.V0vÖX0%R0N0â0L0y002i0jP~0@00&ZaY0}0W&I0u0}000xR8嘴]Ev0m00;1'0GNz0u.0!50x1𐄂000qVp𐄂0>{𐄂000^cM𐄂0
ubuntu@ubuntu-VirtualBox:~/Desktop/A$ cat dmsgB.txt
This is the message from B to A
A how are you ?
ubuntu@ubuntu-VirtualBox:~/Desktop/A$
```

```
ubuntu@ubuntu-VirtualBox:~/Desktop/B$ ls
keypairB.pem  msgB.txt  publicB.pem
ubuntu@ubuntu-VirtualBox:~/Desktop/B$ cp publicB.pem /home/ubuntu/Desktop/A/publicB.pem
ubuntu@ubuntu-VirtualBox:~/Desktop/B$ ls
keypairB.pem  msgB.txt  publicA.pem  publicB.pem
ubuntu@ubuntu-VirtualBox:~/Desktop/B$ openssl rsautl -encrypt -in msgB.txt -out emsgB.txt -inkey publ
icA.pem -pubin
ubuntu@ubuntu-VirtualBox:~/Desktop/B$ ls
emsgB.txt  keypairB.pem  msgB.txt  publicA.pem  publicB.pem
ubuntu@ubuntu-VirtualBox:~/Desktop/B$ cp emsgB.txt /home/ubuntu/Desktop/A/emsgB.txt
ubuntu@ubuntu-VirtualBox:~/Desktop/B$ ls
emsgA.txt  emsgB.txt  keypairB.pem  msgB.txt  publicA.pem  publicB.pem
ubuntu@ubuntu-VirtualBox:~/Desktop/B$ openssl rsautl -decrypt -in emsgA.txt -out dmsgA.txt -inkey key
pairB.pem
ubuntu@ubuntu-VirtualBox:~/Desktop/B$ cat emsgA.txt
0a:000!00}006pFx000h?00ovYj0+.Fx0[^00q00"#0Y00w2-000Y000G00!00M08000D0000H000A0000F0r*éA00jV0:qJw00
00000+_wp0R0c*0QCW0000
X000 0
C
02|s0!U0#ubuntu@ubuntu-VirtualBox:~/Desktop/B$ cat dmsgA.txt
This is the message from A to B
Hi B how are you ?
ubuntu@ubuntu-VirtualBox:~/Desktop/B$
```