Cryptography & Network Security

PRN - 2019BTECS00026

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Batch - B1

Assignment - 11

Title: Diffie-Hellman Key Exchange

Aim: To Demonstrate Diffie-Hellman Key Exchange

Theory:

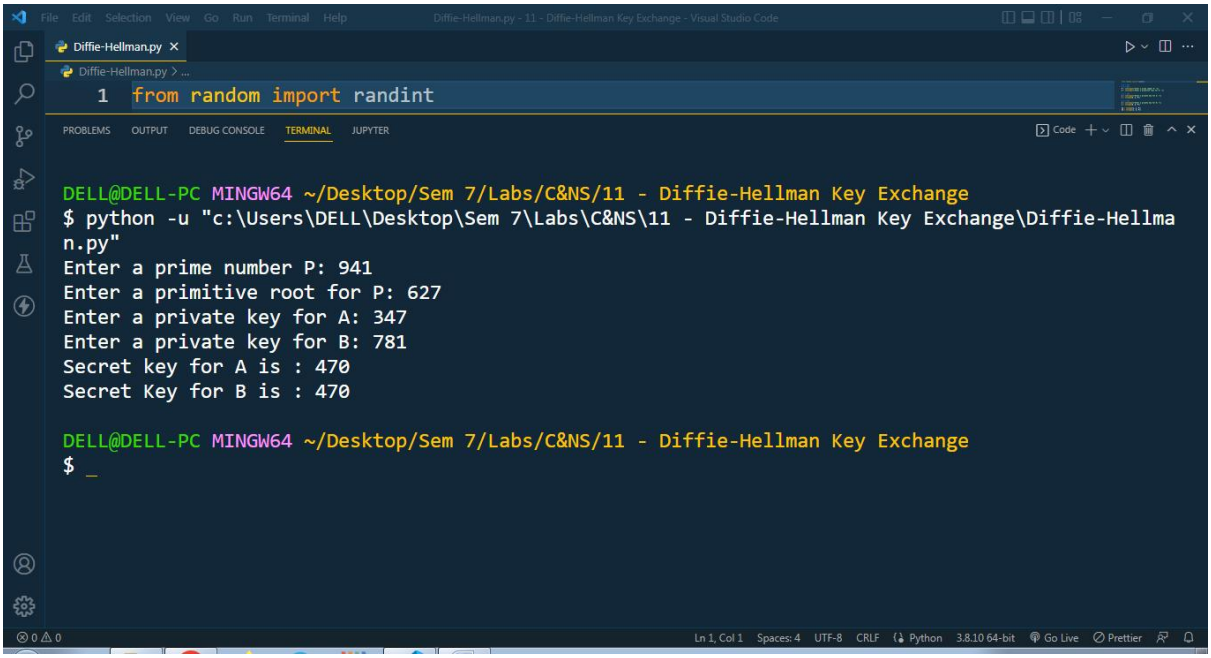
Diffie–Hellman key exchange is a method of securely exchanging cryptographic keys over a public channel and was one of the first public-key protocols as conceived by Ralph Merkle and named after Whitfield Diffie and Martin Hellman.

Code:

```
from random import randint


# P = 941
# G = 627
P = int(input("Enter a prime number P: "))
G = int(input("Enter a primitive root for P: "))


# a = 347
a = int(input("Enter a private key for A: "))
x = int(pow(G, a, P))
```

```
# b = 781
b = int(input("Enter a private key for B: "))
y = int(pow(G, b, P))

ka = int(pow(y, a, P))
kb = int(pow(x, b, P))

print('Secret key for A is : %d' % (ka))
print('Secret Key for B is : %d' % (kb))
```

Output:



Conclusion:

The Diffie–Hellman key exchange method allows two parties that have no prior knowledge of each other to jointly establish a shared secret key over an insecure channel. This key can then be used to encrypt subsequent communications using a symmetric-key cipher.