Write a Java/C/C++/Python program to implement RSA algorithm.

Program:

```
# Python for RSA asymmetric cryptographic algorithm.
# For demonstration, values are
# relatively small compared to practical application
import math

def gcd(a, h):
      temp = 0
      while(1):
            temp = a % h
            if (temp == 0):
                  return h
            a = h
            h = temp

p = int(input("Enter the Prime number P: "))
q = int(input("Enter the Prime number Q: "))
n = p*q
e = 2
phi = (p-1)*(q-1)

while (e < phi):

      # e must be co-prime to phi and
      # smaller than phi.
      if(gcd(e, phi) == 1):
            break
```

```
    else:
        e = e+1
# Private key (d stands for decrypt)
# choosing d such that it satisfies
# d*e = 1 + k * totient

k = 2
d = (1 + (k*phi))/e

# Message to be encrypted
msg=int(input("Enter the Message which we wanted to encrypt : "))

print("Message data = ", msg)

# Encryption c = (msg ^ e) % n
c = pow(msg, e)
c = math.fmod(c, n)
print("Encrypted data = ", c)

# Decryption m = (c ^ d) % n
m = pow(c, d)
m = math.fmod(m, n)
print("Original Message Sent = ", m)
```

Output:

```
Python 3.6.7 Shell
File  Edit  Shell  Debug  Options  Window  Help
Python 3.6.7 (v3.6.7:6ec5cf24b7, Oct 20 2018, 12:45:0
1)] on win32
Type "help", "copyright", "credits" or "license()" fo
>>>
 RESTART: C:\Users\NIS\Desktop\Information Security P
Enter the Prime number P: 7
Enter the Prime number Q: 11
Enter the Message which we wanted to encrypt : 5
Message data =  5
Encrypted data =  47.0
Original Message Sent =  24.0
>>>
```