Ex.No: 5 **RSA ALGORITHM**

Date:

Aim:

To implement RSA Algorithm using HTML and Javascript.

Algorithm:

1) Start the program
2) Get the prime values from the user
3) Computer the n and Φ(n) values.
4) Given the value of e, computer the value of d
5) Generate the public key and the private keys

Program:

```
<html>
  <head>
    <title>RSA Encryption Algorithm</title>
    <style>
button {
 background-color: #f15640;
 border: none;
 color: white;
 padding: 15px 32px;
 text-align: center;
 text-decoration: none;
```

```
  display: inline-block;
  font-size: 16px;
}
</style>
   </head>
   <body>
      <center>
         <h1>RSA Encryption Algorithm</h1>
         <hr>
         <table>
            <tr>
               <td>Enter Number 1:</td>
               <td><input type="text" ></td>
            </tr>
            <tr>
               <td>Enter Number 2:</td>
               <td><input type="text" ></td>
            </tr>
             <tr>
               <td>Enter Public Key:</td>
               <td><input type="text"></td>
            </tr>
            <tr>
```

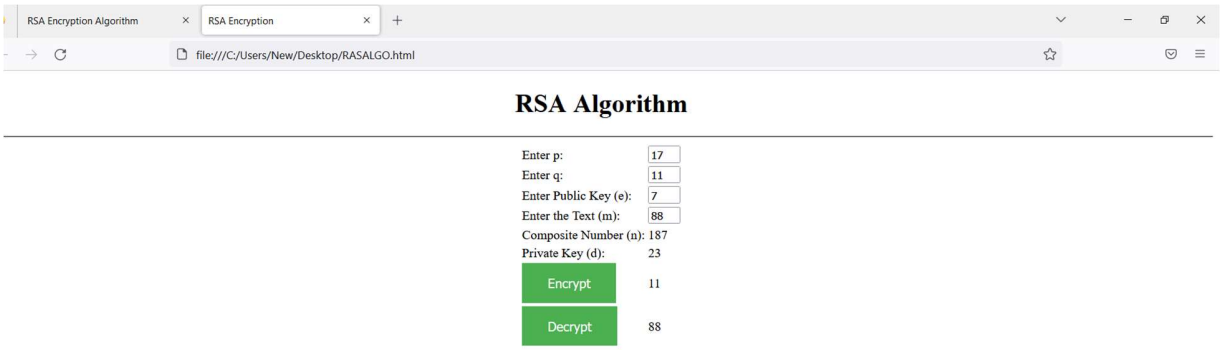
```
  <td>Enter the Text</td>
  <td><input type="text"></td>
</tr>
<tr>
  <td>Composite Number:</td>
  <td>
    <p id="composite"></p>
  </td>
</tr>
<tr>
  <td>Private Key:</td>
  <td>
    <p id="privatekey"></p>
  </td>
</tr>
<tr>

  <td><button onclick="RSA(1); id="button1"">Encrypt</button></td>
  <td>
    <p id="ciphertext" data-inline="true"></p>
  </td>
</tr>
<tr>
```

```
        <td><button onclick="RSA(2); id="button2">Decrypt</button></td>
        <td>
          <p id="plaintext" data-inline="true"></p>
        </td>
      </tr>
    </table>
  </center>
</body>
<script type="text/javascript">
  function RSA(choice) {
  var gcd, p, q, msg, n, t, e,d,i;
  gcd = function (a, b) { return (b!=0) ? gcd(b, a % b) :a ; };
  p = document.getElementById('p').value;
  q = document.getElementById('q').value;
  msg = document.getElementById('msg').value;
  e = document.getElementById('publickey').value;
  n = p * q;
  t = (p - 1) * (q - 1);
  for (d = 2; d < t; d++) {
  if ( (e*d)%t == 1) {
  break;
  }
  }
```

```
    var ct=msg;
    for(i=2;i<=e;i++)
    ct=(ct*msg)%n;
    var pt=msg;
    for(i=2;i<=d;i++)
    pt=(pt*msg)%n;
    document.getElementById('composite').innerHTML = n;
    document.getElementById('privatekey').innerHTML = d;
    if(choice==1)
    document.getElementById('ciphertext').innerHTML = ct;
    else
    document.getElementById('plaintext').innerHTML = msg;
    }
  </script>
</html>
```

Output:



Result:

Thus, RSA algorithm has been implemented and verified successfully.