LAB-7

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DIFFIE-HELLMAN KEY EXCHANGE

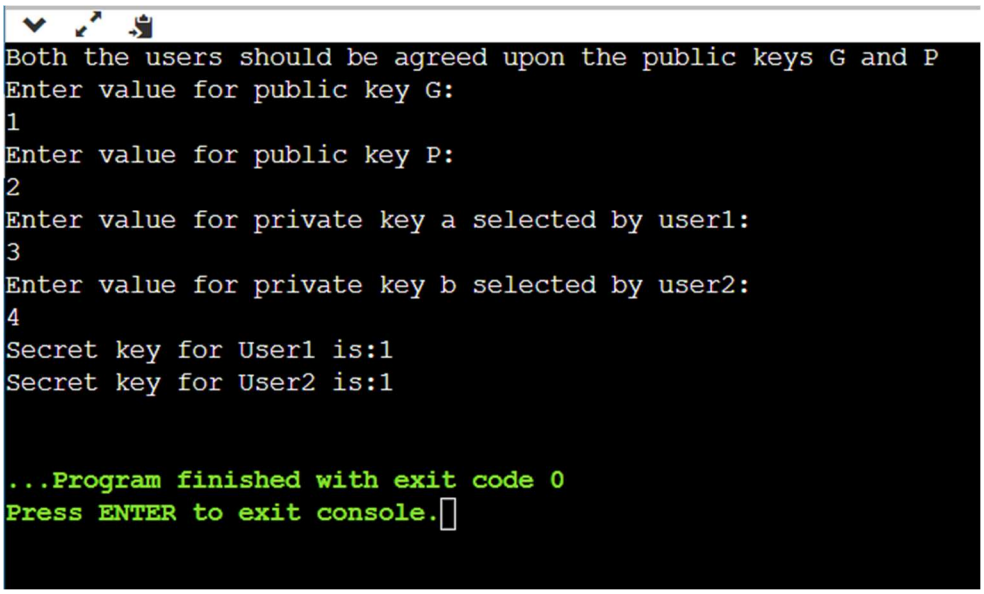
CODE:

```
import java.util.*;
// create class DiffieHellmanAlgorithmExample to calculate the key for two persons
class Main {
   // main() method start
   public static void main(String[] args)
   {
      long P, G, x, a, y, b, ka, kb;
      // create Scanner class object to take input from user
      Scanner sc = new Scanner(System.in);
      System.out.println("Both the users should be agreed upon the public keys G and P");
      // take inputs for public keys from the user
      System.out.println("Enter value for public key G:");
      G = sc.nextLong();
      System.out.println("Enter value for public key P:");
      P = sc.nextLong();
      // get input from user for private keys a and b selected by User1 and User2
      System.out.println("Enter value for private key a selected by user1:");
      a = sc.nextLong();
      System.out.println("Enter value for private key b selected by user2:");
      b = sc.nextLong();

      // call calculatePower() method to generate x and y keys
      x = calculatePower(G, a, P);
      y = calculatePower(G, b, P);
```

```
        // call calculatePower() method to generate ka and kb secret keys after the exchange of x and y keys
        // calculate secret key for User1
        ka = calculatePower(y, a, P);
        // calculate secret key for User2
        kb = calculatePower(x, b, P);
        // print secret keys of user1 and user2
        System.out.println("Secret key for User1 is:" + ka);
        System.out.println("Secret key for User2 is:" + kb);
    }
    // create calculatePower() method to find the value of x ^ y mod P
    private static long calculatePower(long x, long y, long P)
    {
        long result = 0;
        if (y == 1){
            return x;
        }
        else{
            result = ((long)Math.pow(x, y)) % P;
            return result;
        }
    }
}
```

OUTPUT:


Both the users should be agreed upon the public keys G and P
Enter value for public key G:
1
Enter value for public key P:
2
Enter value for private key a selected by user1:
3
Enter value for private key b selected by user2:
4
Secret key for User1 is:1
Secret key for User2 is:1
...Program finished with exit code 0
Press ENTER to exit console.