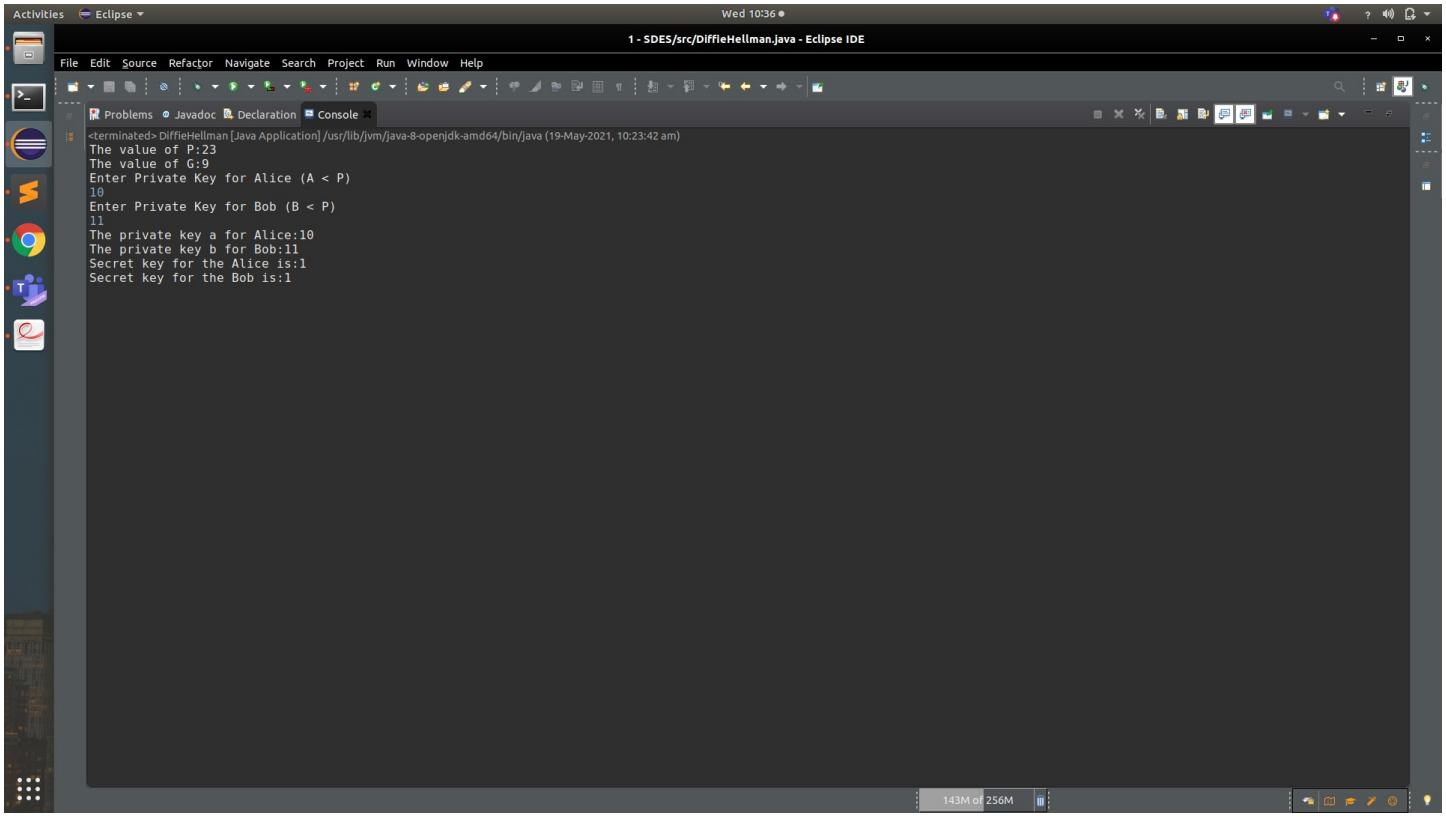
Program:

```
import java.util.*;

public class DiffieHellman {

	private static long power(long a, long b, long p)
	{
	    if (b == 1)
	        return a;
	    else
	        return (((long)Math.pow(a, b)) % p);
	}

	public static void main(String[] args)
	{
		Scanner sc = new Scanner(System.in);

	    long P, G, x, a, y, b, ka, kb;

	    P = 23;
	    System.out.println("The value of P:" + P);

	    G = 9;
	    System.out.println("The value of G:" + G);

	    // Alice will choose the private key a
	    System.out.println("Enter Private Key for Alice (A < P)");
	    a = sc.nextLong();

	    // Bob will choose the private key b
	    System.out.println("Enter Private Key for Bob (B < P)");
	    b = sc.nextLong();

	    System.out.println("The private key a for Alice:" + a);
	    System.out.println("The private key b for Bob:" + b);

	    x = power(G, a, P);
	    y = power(G, b, P);

	    // Generating the secret key after the exchange of keys
	    ka = power(y, a, P);
	    kb = power(x, b, P);

	    System.out.println("Secret key for the Alice is:" + ka);
	    System.out.println("Secret key for the Bob is:" + kb);

	    sc.close();
	}

}
```

Output:


Activities
Eclipse
Wed 10:36
1 - SDES/src/DiffieHellman.java - Eclipse IDE
File Edit Source Refactor Navigate Search Project Run Window Help
Problems Javadoc Declaration Console
<terminated> DiffieHellman [Java Application] /usr/lib/jvm/java-8-openjdk-amd64/bin/java (19-May-2021, 10:23:42 am)
The value of P:23
The value of G:9
Enter Private Key for Alice (A < P)
10
Enter Private Key for Bob (B < P)
11
The private key a for Alice:10
The private key b for Bob:11
Secret key for the Alice is:1
Secret key for the Bob is:1
143M of 256M