Assignment 10

```
// This program calculates the Key for two persons using the Diffie-Hellman Key exchange algorithm
class Assignment10 {
	// Power function to return value of a ^ b mod P
	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)
	{
		long P, G, x, a, y, b, ka, kb;
		// Both the persons will be agreed upon the public keys G and P

		// A prime number P is taken
		P = 23;
		System.out.println("The value of P:" + P);
		// A primitive root for P, G is taken
		G = 9;
		System.out.println("The value of G:" + G);
		// Alice will choose the private key a
		// a is the chosen private key
		a = 4;
		System.out.println("The private key a for Alice:" + a);
		// Gets the generated key
		x = power(G, a, P);
		// Bob will choose the private key b
		// b is the chosen private key
		b = 3;
```

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

        // Gets the generated key
        y = power(G, b, P);
        // Generating the secret key after the exchange
        // of keys
        ka = power(y, a, P); // Secret key for Alice
        kb = power(x, b, P); // Secret key for Bob

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