Output :- Modular Arithmetic

```
cd "/Users/Don't Open/5th Sem/Lab/Aaryan_28900/Crypto/Lab/Lab2/" && gcc Modular_Arithmetic.
ypto/Lab/Lab2/"Modular_Arithmetic
(base) aryankushwaha@Aryan-Kushwaha Lab2 % cd "/Users/Don't Open/5th Sem/Lab/Aaryan_28900/C
sers/Don't Open/5th Sem/Lab/Aaryan_28900/Crypto/Lab/Lab2/"Modular_Arithmetic

Menu:
1. Find Additive Inverse
2. Find Multiplicative Inverse (Extended Euclidean Algorithm)
3. Check if Two Numbers are Relatively Prime
4. Exit
Enter your choice: 1
Enter a number: 34
Enter the modulo: 13
The additive inverse of 34 under modulo 13 is: 5

Menu:
1. Find Additive Inverse
2. Find Multiplicative Inverse (Extended Euclidean Algorithm)
3. Check if Two Numbers are Relatively Prime
4. Exit
Enter your choice: 2
Enter a number: 45
Enter the modulo: 17
The multiplicative inverse of 45 under modulo 17 is: 14

Menu:
1. Find Additive Inverse
2. Find Multiplicative Inverse (Extended Euclidean Algorithm)
3. Check if Two Numbers are Relatively Prime
4. Exit
Enter your choice: 3
Enter the first number: 17
Enter the second number: 19
17 and 19 are relatively prime.

Menu:
1. Find Additive Inverse
2. Find Multiplicative Inverse (Extended Euclidean Algorithm)
3. Check if Two Numbers are Relatively Prime
4. Exit
Enter your choice: 4
Exiting...
(base) aryankushwaha@Aryan-Kushwaha Lab2 %
```

Output : - S-box Implementation for AES

```
cd "/Users/Don't Open/5th Sem/Lab/Aaryan_28900/Crypto/Lab/Lab2/" && gcc S_Box_AES.c -o S_Box_AES && "/Users/Don'
ox_AES
(base) aryankushwaha@Aryan-Kushwaha Lab2 % cd "/Users/Don't Open/5th Sem/Lab/Aaryan_28900/Crypto/Lab/Lab2/" && g
h Sem/Lab/Aaryan_28900/Crypto/Lab/Lab2/"S_Box_AES

Menu:
1. Substitute byte using S-box
2. Substitute byte using Inverse S-box
3. Exit
Enter your choice: 1
Enter a byte (in hex, e.g., 53): F5
Input byte: 0xf5
Int value for the input is is 245
Substituted byte: 0xe6

Menu:
1. Substitute byte using S-box
2. Substitute byte using Inverse S-box
3. Exit
Enter your choice: 2
Enter a byte (in hex, e.g., 53): A0
Input byte: 0xa0
Inverse substituted byte: 0x47

Menu:
1. Substitute byte using S-box
2. Substitute byte using Inverse S-box
3. Exit
Enter your choice: 3
Exiting...
(base) aryankushwaha@Aryan-Kushwaha Lab2 %
```

Output : - Key Generation Process in DES