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Task 2

How to compile the program:

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1. Open your command prompt
2. Navigate to folder where files are stored
3. javac knapsack.java
4. java knapsack
5. Follow instruction on console

Output Screenshot:

Enter knapsack and validate knapsack

```
sallyyeo@sallys-MacBook-Pro SIK % java knapsack
Enter size of super-increasing knapsack (7 or more): 7
Size of super-increasing knapsack has been initialised as 7

Please enter 7 values of a:
Enter value of a1 (must be more than 0): 1
Enter value of a2 (must be more than 1): 2
Enter value of a3 (must be more than 3): 4
Enter value of a4 (must be more than 7): 6
Enter value of a4 (must be more than 7): 8
Enter value of a5 (must be more than 15): 14
Enter value of a5 (must be more than 15): 16
Enter value of a6 (must be more than 31): 32
Enter value of a7 (must be more than 63): 64
Your super-increasing knapsack values are:
1 2 4 8 16 32 64
```

Validate Modulus & Multiplier, showing public key

```
Enter a modulus (Must be greater than 127 and must be a prime number): 128
(Hint: The smallest prime number greater than 127 is 131)
Enter a modulus (Must be greater than 127 and must be a prime number): 131
Your modulus p is: 131
Enter a multiplier (Must be relatively prime and lesser than 131): 132
(Hint: The largest number relative to 131 is 130)
Enter a multiplier (Must be relatively prime and lesser than 131): 130
Your public key values are:
130 129 127 123 115 99 67
Enter your message to be encrypted: hi me
```

Encrypt & Decrypt

```
Your encrypted message is:
[382, 449, 129, 564, 441]
Enter value to be decrypted ONE BY ONE (Enter 'decrypt' to stop appending): 382
Decrypted letter in binary : 1101000
Decrypted letter in decimal: 104
Enter value to be decrypted ONE BY ONE (Enter 'decrypt' to stop appending): 449
Decrypted letter in binary : 1101001
Decrypted letter in decimal: 105
Enter value to be decrypted ONE BY ONE (Enter 'decrypt' to stop appending): 129
Decrypted letter in binary : 0100000
Decrypted letter in decimal: 32
Enter value to be decrypted ONE BY ONE (Enter 'decrypt' to stop appending): 564
Decrypted letter in binary : 1101101
Decrypted letter in decimal: 109
Enter value to be decrypted ONE BY ONE (Enter 'decrypt' to stop appending): 441
Decrypted letter in binary : 1100101
Decrypted letter in decimal: 101
Enter value to be decrypted ONE BY ONE (Enter 'decrypt' to stop appending): decrypt
Decrypted letter in binary : 1100101
Decrypted letter in decimal: 101
======================================================================
Your decrypted message is: hi me%
```