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## 1.lab-01

ex01:

Hello.py

```
/usr/bin/python3.13 /home/kaaru/PycharmProjects/bmttnc-hutech-2280601361/lab-01/ex01/Hello.py
Hello World
My name is Khar
HUTECH university

Process finished with exit code 0
```

ex02:

ex02\_01.py

```
/usr/bin/python3.13 /home/kaaru/PycharmProjects/bmttnc-hutech-2280601361/lab-01/ex02/ex02_01.py
Nhập tên của bạn: kha
Nhập tuổi của bạn: 10
Chào mừng, kha .Số tuổi của bạn là: 10

Process finished with exit code 0
```

ex02\_02.py

```
/usr/bin/python3.13 /home/kaaru/PycharmProjects/bmttnc-hutech-2280601361/lab-01/ex02/ex02_02.py
Nhập bán kính của hình tròn: 5
Diện tích hình tròn là: 78.5

Process finished with exit code 0
```

ex02\_03.py

```
/usr/bin/python3.13 /home/kaaru/PycharmProjects/bmttnc-hutech-2280601361/lab-01/ex02/ex02_03.py
Nhập một số nguyên: 5
Số 5 là số lẻ

Process finished with exit code 0
```

ex02\_04.py

```
/usr/bin/python3.13 /home/kaaru/PycharmProjects/bmttnc-hutech-2280601361/lab-01/ex02/ex02_04.py
2002, 2009, 2016, 2023, 2037, 2044, 2051, 2058, 2072, 2079, 2086, 2093, 2107, 2114, 2121, 2128,

Process finished with exit code 0
```

### ex02\_05.py

```
/usr/bin/python3.13 /home/kaaru/PycharmProjects/bmttnc-hutech-2280601361/lab-01/ex02/ex02_05.py
Nhập số giờ: 5
Nhập thù lao trên mỗi giờ làm tiêu chuẩn: 12000
Số tiền thực lĩnh của nhân viên: 528000.0

Process finished with exit code 0
```

### ex02\_06.py

```
/usr/bin/python3.13 /home/kaaru/PycharmProjects/bmttnc-hutech-2280601361/lab-01/ex02/ex02_06.py
Nhập X, Y: 5,2
[[0, 0], [0, 1], [0, 2], [0, 3], [0, 4]]

Process finished with exit code 0
|
```

### ex02\_07.py

```
/usr/bin/python3.13 /home/kaaru/PycharmProjects/bmttnc-hutech-2280601361/lab-01/ex02/ex02_07.py
Nhập các dòng từ văn bản (Nhập 'Done' để kết thúc:
xin chao toi la pham hoang tuan kha
done
XIN CHAO TOI LA PHAM HOANG TUAN KHA

Process finished with exit code 0
|
```

### ex02\_08.py

```
/usr/bin/python3.13 /home/kaaru/PycharmProjects/bmttnc-hutech-2280601361/lab-01/ex02/ex02_08.py
Nhập chuỗi số nhị phân (phân tách bởi dấu phẩy): 1000, 1011, 1111, 1101
Các số nhị phân chia hết cho 5 là: 1111

Process finished with exit code 0
|
```

### ex02\_09.py

```
/usr/bin/python3.13 /home/kaaru/PycharmProjects/bmttnc-hutech-2280601361/lab-01/ex02/ex02_09.py
Nhập vào số cần kiểm tra: 15
15 không phải là số nguyên tố.

Process finished with exit code 0
|
```

### ex02\_10.py

```
/usr/bin/python3.13 /home/kaaru/PycharmProjects/bmttnc-hutech-2280601361/lab-01/ex02/ex02_10.py
Mời nhập chuỗi cần đảo ngược: phamhoangtuankha
Chuỗi đảo ngược là: ahknautgnaohmahp

Process finished with exit code 0
|
```

ex03:

ex03\_01.py

```
/usr/bin/python3.13 /home/kaaru/PycharmProjects/bmttnc-hutech-2280601361/lab-01/ex03/ex03_01.py
Nhập danh sách các số, cách nhau bằng dấu phẩy: 12, 13, 14, 15, 16
Tổng các số chẵn trong List: 42
```

```
Process finished with exit code 0
```

|

ex03\_02.py

```
/usr/bin/python3.13 /home/kaaru/PycharmProjects/bmttnc-hutech-2280601361/lab-01/ex03/ex03_02.py
Nhập danh sách các số, cách nhau bằng dấu phẩy: 12, 15, 16, 17, 19, 20
List sau khi đảo ngược: [20, 19, 17, 16, 15, 12]
```

```
Process finished with exit code 0
```

ex03\_03.py

```
/usr/bin/python3.13 /home/kaaru/PycharmProjects/bmttnc-hutech-2280601361/lab-01/ex03/ex03_03.py
Nhập danh sách các số, cách nhau bằng dấu phẩy: 22, 59, 30, 21, 22
List: [22, 59, 30, 21, 22]
Tuple từ List: (22, 59, 30, 21, 22)
```

```
Process finished with exit code 0
```

ex03\_04.py

```
/usr/bin/python3.13 /home/kaaru/PycharmProjects/bmttnc-hutech-2280601361/lab-01/ex03/ex03_04.py
Nhập tuple, ví dụ (1, 2, 3): 1, 2, 3
Phần tử đầu tiên: 1
Phần tử cuối cùng: 3
```

```
Process finished with exit code 0
```

ex03\_05.py

```
/usr/bin/python3.13 /home/kaaru/PycharmProjects/bmttnc-hutech-2280601361/lab-01/ex03/ex03_05.py
Nhập danh sách các từ, cách nhau bằng dấu cách: hom nay troi mat nen toi an kem cho mat
Số lần xuất hiện của các phần tử: {'hom': 1, 'nay': 1, 'troi': 1, 'mat': 2, 'nen': 1, 'toi': 1, 'an': 1, 'kem': 1, 'cho': 1}

Process finished with exit code 0
```

|

ex03\_06.py

```
/usr/bin/python3.13 /home/kaaru/PycharmProjects/bmttnc-hutech-2280601361/lab-01/ex03/ex03_06.py
Phần tử đã được xoá từ Dictionary: {'a': 1, 'c': 3, 'd': 4}

Process finished with exit code 0
```

|

ex04:

Quan ly sinh vien:

```
CHUONG TRINH QUAN LY SINH VIEN
1. Them sinh vien
2. Cap nhat thong tin sinh vien boi ID
3. Xoa sinh vien boi ID
4. Tim kiem sinh vien theo ten
5. Sap xep sinh vien theo diem trung binh
6. Sap xep sinh vien theo ten chuyen nganh
7. Hien thi danh sach sinh vien
0. Thoat
Nhap tuy chon: 1
```

```
1. Them sinh vien
Nhap ten sinh vien: nguyen
Nhap gioi tinh sinh vien: nam
Nhap chuyen nganh sinh vien: cntt
Nhap diem cua sinh vien: 9
```

```
Them sinh vien thanh cong!
```

```
Nhap tuy chon: 2

2. Cap nhat thong tin sinh vien

Nhap ID:
1
Nhap ten sinh vien: kha
Nhap gioi tinh sinh vien: nam
Nhap chuyen nganh sinh vien: cnpm
Nhap diem cua sinh vien: 5
```

```
Nhap tuy chon: 3
```

```
3. Xoa sinh vien
```

```
Nhap ID:
3
```

```
Sinh vien co id=3 da bi xoa.
```

Nhap tuy chon: 4

4. Tim kiem sinh vien theo ten

Nhap ten de tim kiem:

kha

ID	Name	Sex	Major	DiemTB	Hoc Luc
1	kha	nam	cnpm	5.00	Trung binh

Nhap tuy chon: 5

5. Sap xep sinh vien theo diem trung binh (GPA)

ID	Name	Sex	Major	DiemTB	Hoc Luc
2	nguyen	nam	cntt	9.00	Gioi
1	kha	nam	cnpm	5.00	Trung binh

Nhap tuy chon: 6

6. Sap xep sinh vien theo ten chuyen nganh

ID	Name	Sex	Major	DiemTB	Hoc Luc
1	kha	nam	cnpm	5.00	Trung binh
2	nguyen	nam	cntt	9.00	Gioi

Nhap tuy chon: 7

7. Hien thi danh sach sinh vien

ID	Name	Sex	Major	DiemTB	Hoc Luc
1	kha	nam	cnpm	5.00	Trung binh
2	nguyen	nam	cntt	9.00	Gioi

## 2.lab02

ex01:

Caesar cipher

POST  none  form-data  x-www-form-urlencoded  raw  binary  GraphQL **JSON** ▾

```
1 {
2   "plain_text": "PHAMHOANGTUANKHA",
3   "key": "3"
4 }
```

Body Cookies Headers (5) Test Results ⌂

{ } **JSON** ▾ ▶ Preview ⚡ Visualize ▾

```
1 {
2   "encrypted_message": "SKDPKRDQJWXDQNKD"
3 }
```

POST  none  form-data  x-www-form-urlencoded  raw  binary  GraphQL **JSON** ▾

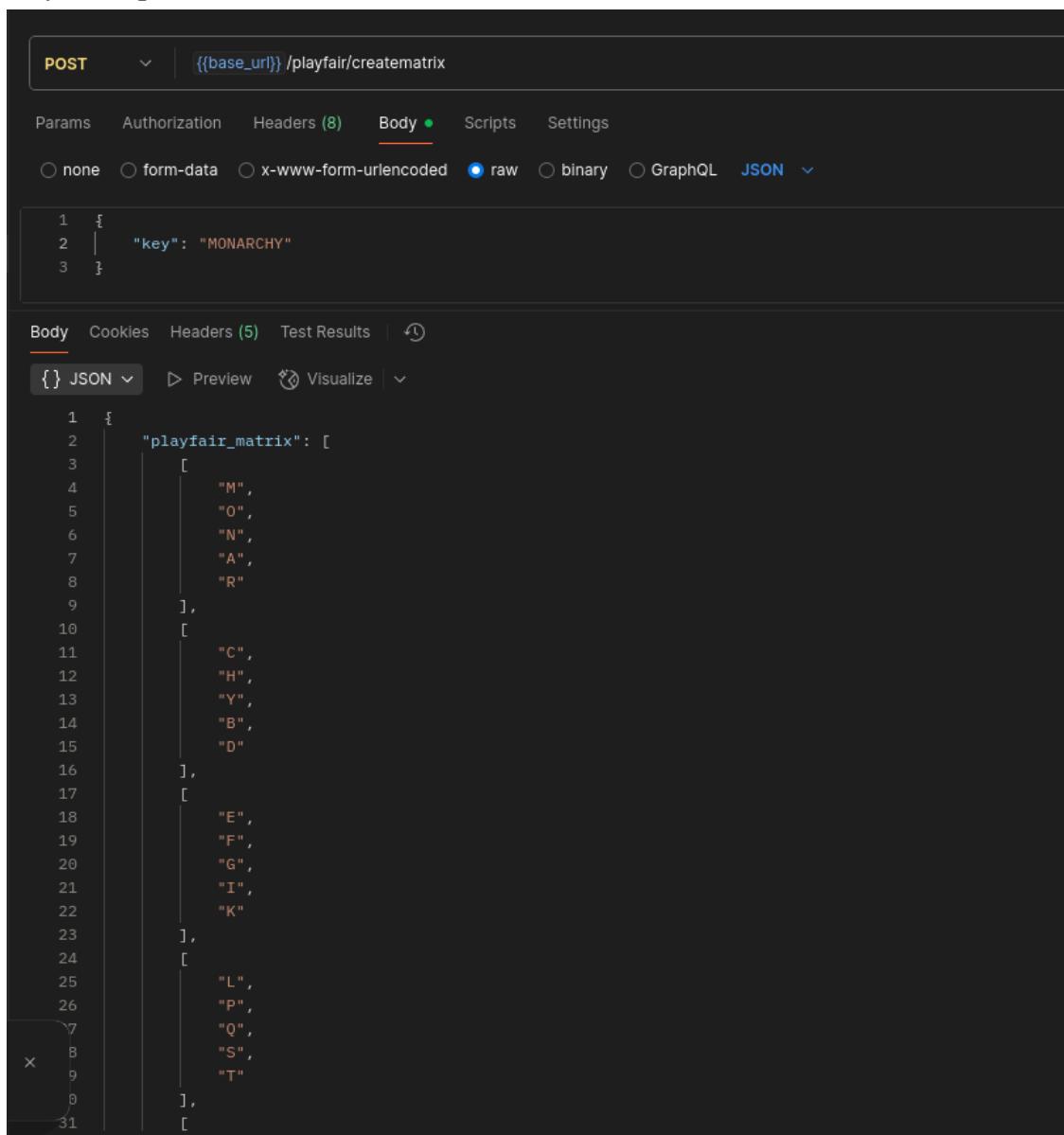
```
1 {
2   "cipher_text": "SKDPKRDQJWXDQNKD",
3   "key": "3"
4 }
```

Body Cookies Headers (5) Test Results ⌂

{ } **JSON** ▾ ▶ Preview ⚡ Visualize ▾

```
1 {
2   "decrypted_message": "PHAMHOANGTUANKHA"
3 }
```

## Playfair cipher



POST {{base\_url}} /playfair/creatematrix

Params Authorization Headers (8) Body Scripts Settings

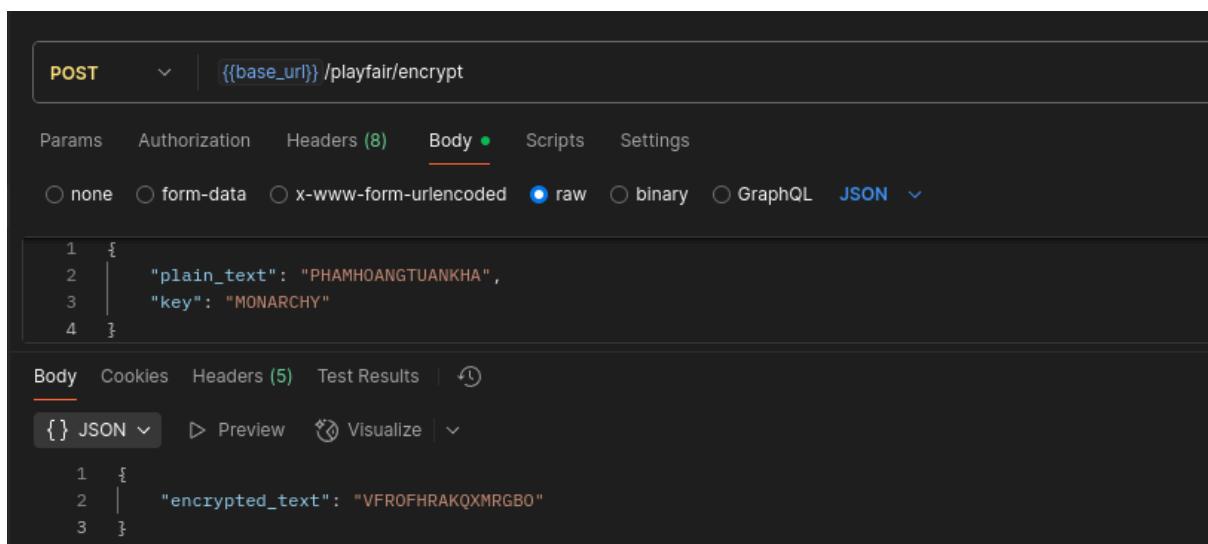
Body

```
1 {  
2   "key": "MONARCHY"  
3 }
```

Body Cookies Headers (5) Test Results

{} JSON ▾ ▷ Preview ⚡ Visualize ▾

```
1 {  
2   "playfair_matrix": [  
3     [  
4       "M",  
5       "O",  
6       "N",  
7       "A",  
8       "R",  
9     ],  
10    [  
11      "C",  
12      "H",  
13      "Y",  
14      "B",  
15      "D",  
16    ],  
17    [  
18      "E",  
19      "F",  
20      "G",  
21      "I",  
22      "K",  
23    ],  
24    [  
25      "L",  
26      "P",  
27      "Q",  
28      "S",  
29      "T",  
30    ],  
31    [  
32  ]]
```



POST {{base\_url}} /playfair/encrypt

Params Authorization Headers (8) Body Scripts Settings

Body

```
1 {  
2   "plain_text": "PHAMHOANGTUANKHA",  
3   "key": "MONARCHY"  
4 }
```

Body Cookies Headers (5) Test Results

{} JSON ▾ ▷ Preview ⚡ Visualize ▾

```
1 {  
2   "encrypted_text": "VFROFHRAKQXMRGO"  
3 }
```

**POST** | [`{{base\_url}}`](#) /playfair/decrypt

Params Authorization Headers (9) **Body** • Scripts Settings

none  form-data  x-www-form-urlencoded  raw  binary  GraphQL **JSON**

```
1 {  
2   "cipher_text": "VFROFHRAKQXMRGBO",  
3   "key": "MONARCHY"  
4 }
```

Body Cookies Headers (5) Test Results | ⏱

{ } JSON ▾ ▶ Preview ⚡ Visualize | ▾

```
1 {  
2   "decrypted_text": "PHAMHOANGTUANKHA"  
3 }
```

## Railfence cipher

**POST** | [`{{base\_url}}`](#) /railfence/encrypt

Params Authorization Headers (8) **Body** • Scripts Settings

none  form-data  x-www-form-urlencoded  raw  binary  GraphQL **JSON**

```
1 {  
2   "plain_text": "PHAMHOANGTUANKHA",  
3   "key": 3  
4 }
```

Body Cookies Headers (5) Test Results | ⏱

{ } JSON ▾ ▶ Preview ⚡ Visualize | ▾

```
1 {  
2   "encrypted_text": "PHGNHMONTAKAAAUIH"  
3 }
```

**POST** | [`{{base\_url}}`](#) /railfence/decrypt

Params Authorization Headers (9) **Body** • Scripts Settings

none  form-data  x-www-form-urlencoded  raw  binary  GraphQL **JSON**

```
1 {  
2   "cipher_text": "PHGNHMONTAKAAAUIH",  
3   "key": 3  
4 }
```

Body Cookies Headers (5) Test Results | ⏱

{ } JSON ▾ ▶ Preview ⚡ Visualize | ▾

```
1 {  
2   "decrypted_text": "PHAMHOANGTUANKHA"  
3 }
```

## Transposition cipher

The screenshot shows two API requests in Postman:

**Request 1: POST {{base\_url}}/transposition/encrypt**

Body (raw JSON):

```
1 {
2   "plain_text": "PHAMHOANGTUANKHA",
3   "key": "3"
4 }
```

**Request 2: POST {{base\_url}}/transposition/decrypt**

Body (raw JSON):

```
1 {
2   "cipher_text": "PMATNAHHNUKAOGAH",
3   "key": "3"
4 }
```

## Vigenere cipher

The screenshot shows one API request in Postman:

**POST {{base\_url}}/vigenere/encrypt**

Body (raw JSON):

```
1 {
2   "plain_text": "PHAMHOANGTUANKHA",
3   "key": "ABC"
4 }
```

**Response Body (raw JSON):**

```
1 {
2   "encrypted_text": "PICMIQAOITVCNLJA"
3 }
```

The screenshot shows a POST request to `/{{base_url}}/vigenere/decrypt`. The Body tab is selected, showing a JSON payload:

```
1 {  
2   "cipher_text": "PICMIQAOITVCNLJA",  
3   "key": "ABC"  
4 }
```

The response body is also JSON:

```
1 {  
2   "decrypted_text": "PHAMHOANGTUANKHA"  
3 }
```

### Ceasar cipher trên giao diện web

#### CAESAR CIPHER

##### ENCRYPTION

Plain text:

Key:

Encrypt

##### DECRYPTION

Cipher text:

Key:

Decrypt

text: PHAMHOANGTUANKHA  
key: 3  
encrypted text: SKDPKRDQJWXDQNKD

#### DECRYPTION

---

Cipher text:

Key:

Decrypt

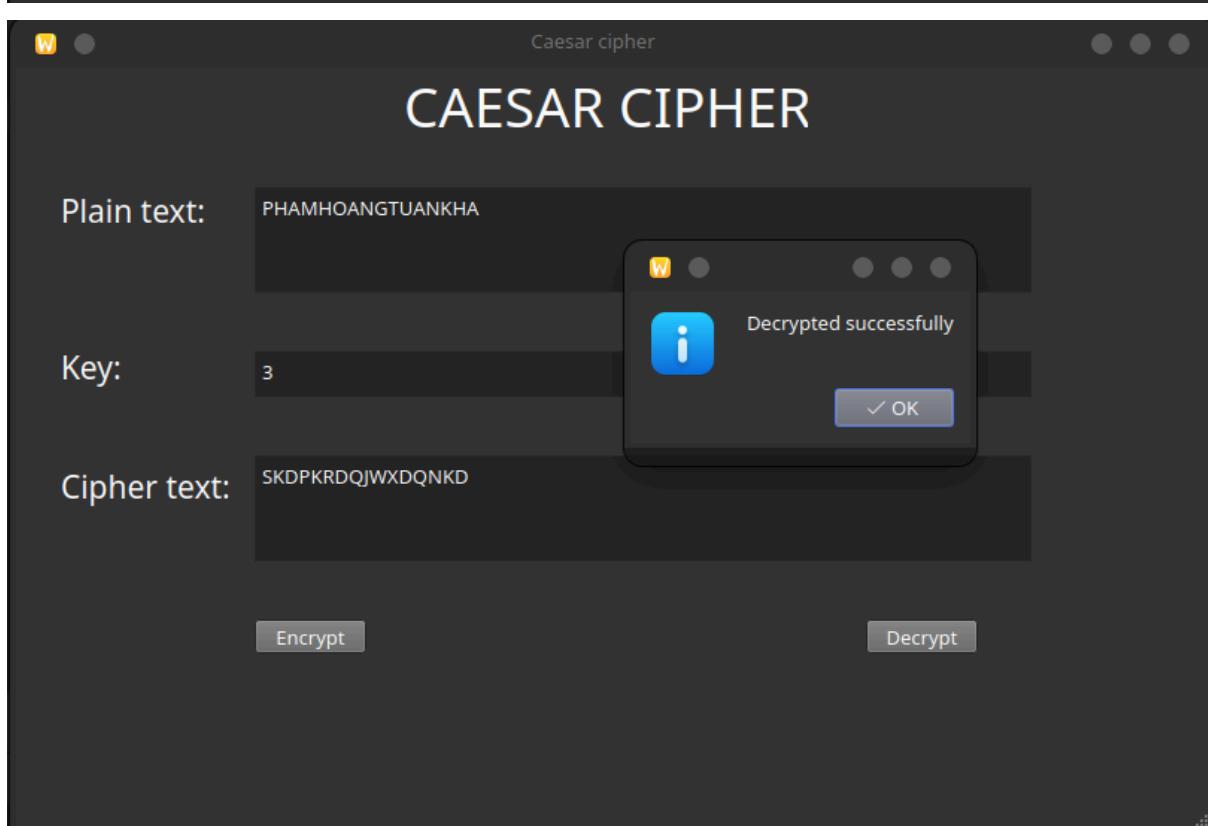
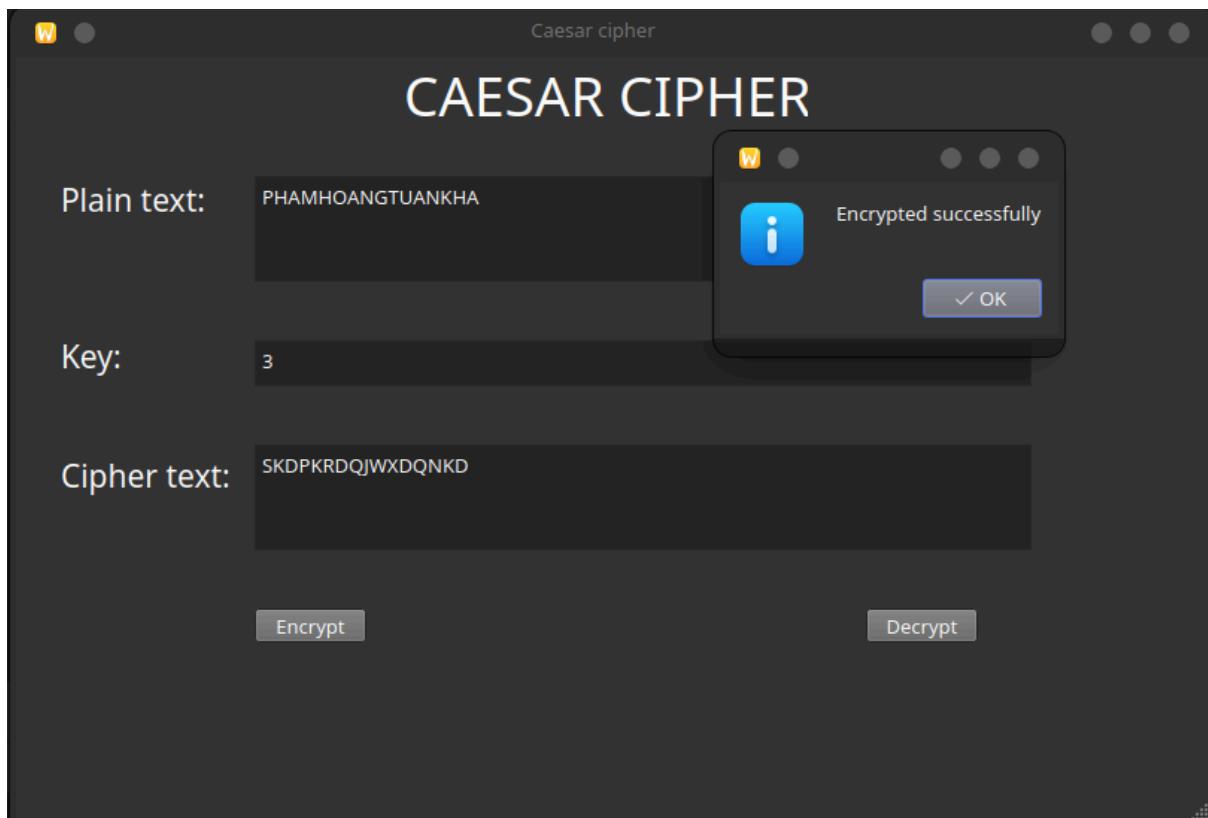
text: SKDPKRDQJWXDQNKD

key: 3

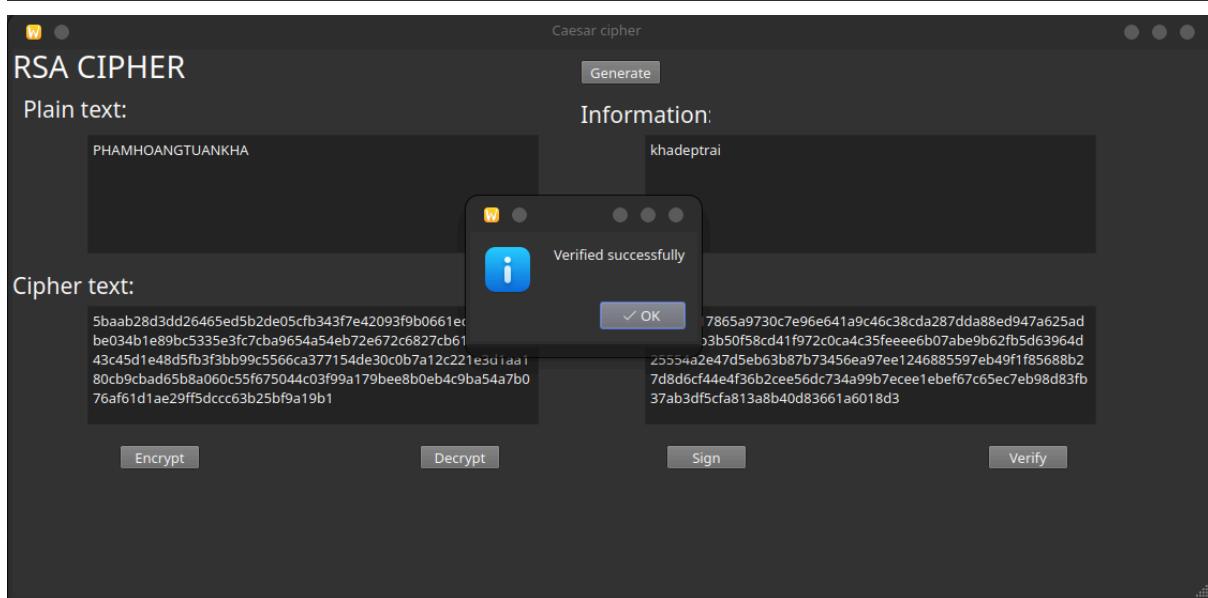
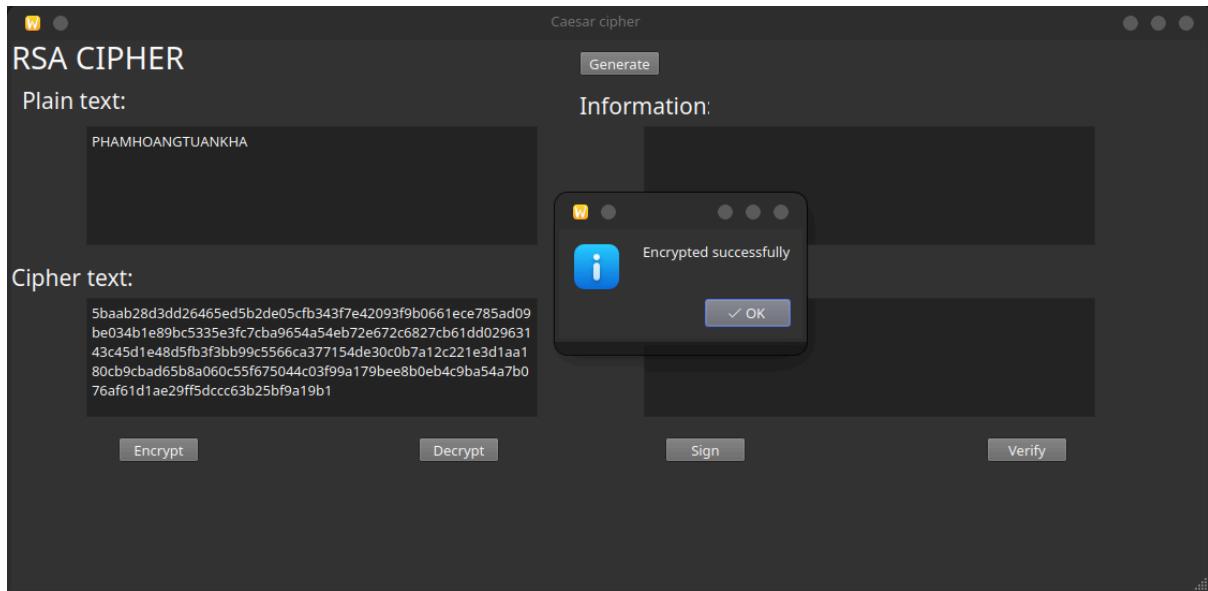
decrypted text: PHAMHOANGTUANKHA

### 3. lab-03

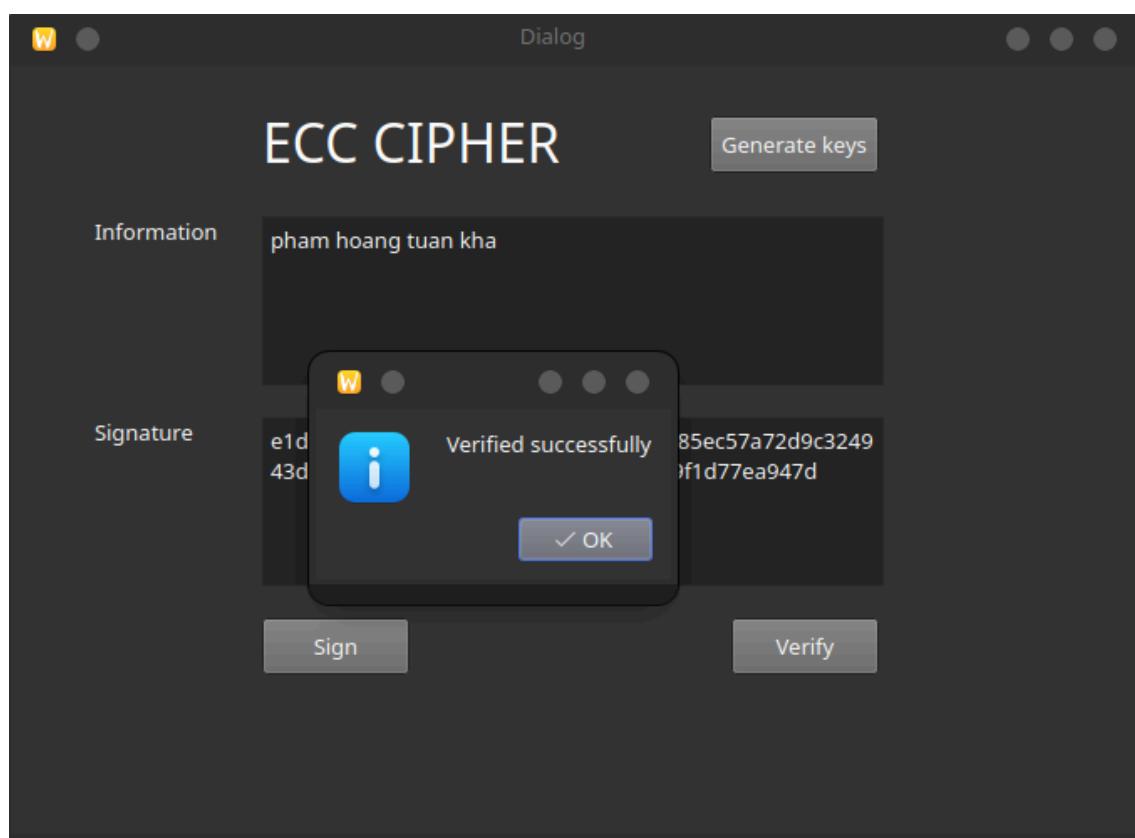
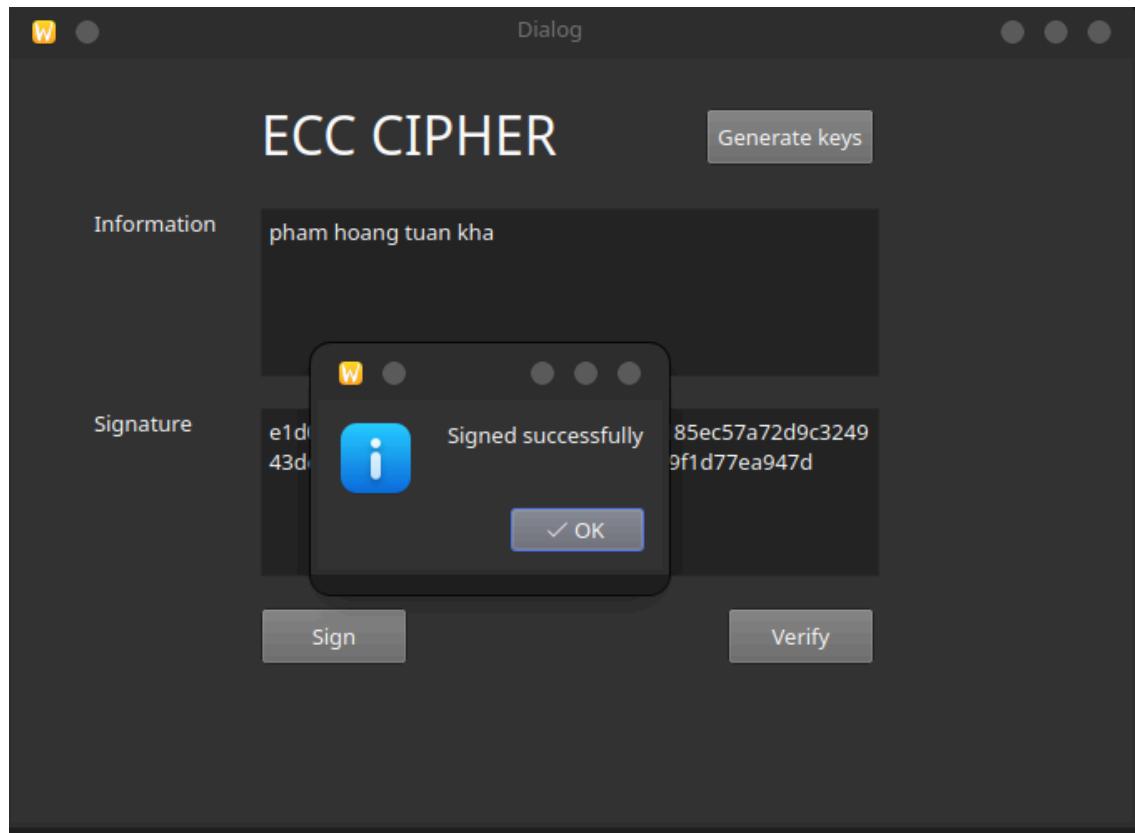
Caesar cipher



## RSA cipher



## ECC cipher



## 4. Lab-04

*aes rsa socket*

```
kaaru@fedora ~ > PycharmProjects > bmttnc-hutech-2280601361 > lab-04 > aes_rsa_socket > !master > python server.py
Connected with ('127.0.0.1', 46180)
Connected with ('127.0.0.1', 47196)
Received from ('127.0.0.1', 46180): xin chao
Received from ('127.0.0.1', 47196): rat vui duoc gap ban

kaaru@fedora ~ > PycharmProjects > bmttnc-hutech-2280601361 > lab-04 > aes_rsa_socket > !master > python client.py
Enter message ('exit' to quit): xin chao
Enter message ('exit' to quit): Received: rat vui duoc gap ban

kaaru@fedora ~ > PycharmProjects > bmttnc-hutech-2280601361 > lab-04 > aes_rsa_socket > !master > python client.py
Enter message ('exit' to quit): Received: xin chao
rat vui duoc gap ban
Enter message ('exit' to quit): '
```

*dh\_key\_pair*

```
tmux a -t bmtt -s bmttnc-hutech-2280601361
```

...cts > bmttnc-hutech-2280601361 > lab-04 > dh\_key\_pair > !master  
python server.py  
...cts > bmttnc-hutech-2280601361 > lab-04 > dh\_key\_pair > !master

...cts > bmttnc-hutech-2280601361 > lab-04 > dh\_key\_pair > !master  
python client.py  
Shared secret: 1241d00dc62cf281d6d05c13b3f8256eaa2917d1742ca1c962  
9953bc2afc2fe3d962521358a76d4c1b9a36fd94e984076b183b666aef7a7162fb  
a8cbe869d39ffc98122049b34c90c9337d9fd76baac52a6a043c639cc4b2c887d3  
e2d9d517d499d7dd77dc46f012fbf0282f0f65d69d51532ce2c925732c2ef00af12  
a466859ebabbe83598138a3c6db916a61ed51b917007f971dc6a5135c670010dc  
5ffa087aa001658c414f32387d6bcc6a45f8b48e1fc83f0773c23d0c41831165238  
d64811f869fe5d5ae40a2c6993b5aa5ac8bf82f46fd0804d0902fe03db1fd092b  
d6daddde289aaa3ac9d016c2a54d9d63fc53cb6e2114cba1bbecd22b506  
...cts > bmttnc-hutech-2280601361 > lab-04 > dh\_key\_pair > !master

*Hash:*

[sha-256.py](#)

```
/usr/bin/python3.13 /home/kaaru/PycharmProjects/bmttnc-hutech-2280601361/lab-04/hash/sha-256.py
Nhập dữ liệu hash bằng SHA-256: PHAMHOANGTUANKHA
Giá trị hash SHA-256: 40c953e6613cce78e7040019d152290c899ec0105a844506409d9190c123305
|
Process finished with exit code 0
```

[sha-3.py](#)

```
/usr/bin/python3.13 /home/kaaru/PycharmProjects/bmttnc-hutech-2280601361/lab-04/hash/sha-3.py
Nhập chuỗi của bạn: PHAMHOANGTUANKHA
Chuỗi của bạn đã nhập: PHAMHOANGTUANKHA
SHA-3 hash: f9e79e4d32b70b34e2277adda63d99e71641af36e1bceb38e9babfd1c474c458
```

[md5\\_hash.py](#)

```
/usr/bin/python3.13 /home/kaaru/PycharmProjects/bmttnc-hutech-2280601361/lab-04/hash/md5_hash.py
Nhập chuỗi cần băm: PHAMHOANGTUANKHA
Ma băm MD5 của chuỗi 'PHAMHOANGTUANKHA' là: b22d70fd875a8601aa9023c7a55c08e8
|
Process finished with exit code 0
```

[md5\\_library.py](#)

```
/usr/bin/python3.13 /home/kaaru/PycharmProjects/bmttnc-hutech-2280601361/lab-04/hash/md5_library.py
Nhập chuỗi cần băm: PHAMHOANGTUANKHA
Ma băm MD5 của chuỗi 'PHAMHOANGTUANKHA' là: 279fc0a129e96bb6d0507f6571dcb793
|
Process finished with exit code 0
```

[blake2.py](#)

```
/usr/bin/python3.13 /home/kaaru/PycharmProjects/bmttnc-hutech-2280601361/lab-04/hash/blake2.py
Nhập chuỗi của bạn: PHAMHOANGTUANKHA
Chuỗi của bạn đã nhập: PHAMHOANGTUANKHA
BLAKE2 hash: f227ee8be2d9f3fd77bf6a8e3780ef1664792bb9114f5cce9b7cf0a2500b2b73965fb32169236c54b44d1a6b4f4e2fbeafb14e85999a0fa1c4aab01e70228ac4
|
Process finished with exit code 0
```

## Websocket

```
Sending message melon to 2 client(s).
Sending message orange to 2 client(s).
Sending message grape to 2 client(s).
Sending message melon to 2 client(s).
Sending message apple to 2 client(s).
Sending message banana to 2 client(s).
Sending message apple to 2 client(s).
Sending message grape to 2 client(s).

received word from server: melon
received word from server: orange
received word from server: grape
received word from server: melon
received word from server: apple
received word from server: banana
received word from server: apple
received word from server: grape

received word from server: melon
received word from server: orange
received word from server: grape
received word from server: melon
received word from server: apple
received word from server: banana
received word from server: apple
received word from server: grape

1 lab-04/websocket 2 fish
python bmtt
```

## 5. Lab-05

### Base64

```
kaaru@fedora ~ > PycharmProjects > bmttnc-hutech-2280601361 > lab-05 > \lab-06 python base64/encrypt.py
Nhập thông tin cần mã hóa: Phạm Hoang Tuan Kha
Đã mã hóa và ghi vào tệp data.txt
kaaru@fedora ~ > PycharmProjects > bmttnc-hutech-2280601361 > lab-05 > \lab-06 python base64/decrypt.py
Chuỗi sau khi giải mã: Phạm Hoang Tuan Kha
kaaru@fedora ~ > PycharmProjects > bmttnc-hutech-2280601361 > lab-05 > \lab-06
```

SSL

Blockchain

```
kaaru@fedora ~ > PycharmProjects > bmttnc-hutech-2280601361 > lab-05 > blockchain > \lab-06 python test_blockchain.py
Block #1
Timestamp: 1749718442.333257
Transactions: []
Proof: 1
Previous hash: 0
Hash: 29c0c755fd65bc5f2d1de85a2870962e577f070267087195d040a31023106044
-----
Block #2
Timestamp: 1749718442.3337502
Transactions: [{"sender": "Alice", "receiver": "Bob", "amount": 10}, {"sender": "Bob", "receiver": "Charlice", "amount": 5}, {"sender": "Charlie", "receiver": "Alice", "amount": 3}, {"sender": "Genesis", "receiver": "Miner", "amount": 1}]
Proof: 533
Previous hash: 29c0c755fd65bc5f2d1de85a2870962e577f070267087195d040a31023106044
Hash: 3abc9318cf31d52c3ac2c272ea771f5175128150d9410aecdc42e2fd78a604a
-----
Is Blockchain valid: True
```

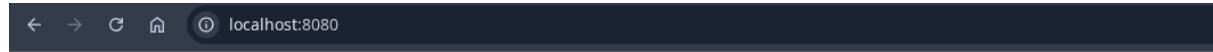
Img-hidden

```
kaaru@fedora ~ > PycharmProjects > bmttnc-hutech-2280601361 > lab-05 > img-hidden > \lab-06 python encrypt.py silly.jpg PhạmHoàngTuanKhaýþ$!Íÿÿ  
Steganography complete. Encoded image saved as encoded_image.png  
kaaru@fedora ~ > PycharmProjects > bmttnc-hutech-2280601361 > lab-05 > img-hidden > \lab-06 python decrypt.py encoded_image.png  
Decoded message: PhạmHoàngTuanKhaýþ$!Íÿÿ  
kaaru@fedora ~ > PycharmProjects > bmttnc-hutech-2280601361 > lab-05 > img-hidden > \lab-06 python decrypt.py silly.jpg  
Decoded message: Á¶Ùm¶ÙvÙm¶ÙI$!Íÿÿ  
kaaru@fedora ~ > PycharmProjects > bmttnc-hutech-2280601361 > lab-05 > img-hidden > \lab-06
```

## 6. Lab-06

*Web server:*

webserver.py



# Hello, this is a simple web server!



# Welcome to the admin page!

webserver-html.py



# Hello, welcome to my website :3



This is admin only! Please contact the administrator for more information or just leave :D

## *Network scanner*

```
kaaru@fedora ~ > PycharmProjects > bmttnc-hutech-2280601361 > lab-06 > Vlab-06 sudo python netscanner/network_scanner.py  
Devices on the local network:  
IP: 192.168.1.1, MAC: b8:29:03:22:77:f8, Vendor: VIETNAM POST AND TELECOMMUNICATION INDUSTRY TECHNOLOGY JOIN STOCK COMPANY  
kaaru@fedora ~ > PycharmProjects > bmttnc-hutech-2280601361 > lab-06 > Vlab-06
```

## *Network capture*

```
kaaru@fedora ~ > PycharmProjects > bmttnc-hutech-2280601361 > lab-06 > Jlab-06 > sudo python netcapture/network_capture.py
Danh sach cac giao dien mang:
1. eno1
2. wlp4s0
3. docker0
Chon giao dien mang(nhap so): 2
Captured packet:
Ether / IP / TCP 162.159.133.234:https > 192.168.1.2:51668 PA / Raw
Captured packet:
Ether / IP / TCP 162.159.133.234:https > 192.168.1.2:51668 PA / Raw
Captured packet:
Ether / IP / TCP 162.159.133.234:https > 192.168.1.2:51668 PA / Raw
Captured packet:
Ether / IP / TCP 162.159.133.234:https > 192.168.1.2:51668 PA / Raw
Captured packet:
Ether / IP / TCP 162.159.133.234:https > 192.168.1.2:51668 PA / Raw
Captured packet:
```

## *Port scanner*

```
kaaru@fedora ~ > PycharmProjects > bmttnc-hutech-2280601361 > lab-06 > lab-06 > sudo python portscanner/port_scanner.py  
Enter the target domain: hutech.edu.vn  
Open common ports:  
[80, 443]  
kaaru@fedora ~ > PycharmProjects > bmttnc-hutech-2280601361 > lab-06 > lab-06 > 
```

*ICMP:*

## icmp listen.py

## icmp\_change.py

```
Modified ICMP Packet:  
Source IP: 192.168.1.2  
Destination IP: 8.8.8.8  
Type: 8  
Code: 0  
ID: 4  
Sequence: 1  
Load: b'This is a modified ICMP packet.'  
=====.  
Sent 1 packets.  
Original ICMP Packet:  
Source IP: 192.168.1.2  
Destination IP: 8.8.8.8  
Type: 0  
Code: 0  
ID: 4  
Sequence: 1  
Load: b'This is a modified ICMP packet.'  
Modified ICMP Packet:  
Source IP: 8.8.8.8  
Destination IP: 192.168.1.2  
Type: 0  
Code: 0  
ID: 4  
Sequence: 1  
Load: b'This is a modified ICMP packet.'
```

```
..> PycharmProjects > bmttnc-hutech-2280601361 > lab-06 > \lab-06  
ping 8.8.8.8  
PING 8.8.8.8 (8.8.8.8) 56(84) bytes of data.  
64 bytes from 8.8.8.8: icmp_seq=1 ttl=116 time=48.2 ms  
64 bytes from 8.8.8.8: icmp_seq=2 ttl=116 time=48.3 ms  
64 bytes from 8.8.8.8: icmp_seq=3 ttl=116 time=55.0 ms  
64 bytes from 8.8.8.8: icmp_seq=4 ttl=116 time=38.7 ms  
64 bytes from 8.8.8.8: icmp_seq=5 ttl=116 time=49.5 ms  
^C  
--- 8.8.8.8 ping statistics ---  
5 packets transmitted, 5 received, 0% packet loss, time 4005ms  
rtt min/avg/max/mdev = 38.704/47.914/54.953/5.233 ms  
..> PycharmProjects > bmttnc-hutech-2280601361 > lab-06 > \lab-06
```

## Monitor:

### monitor.py

```
kaaru@fedora ~ > PycharmProjects > bmttnc-hutech-2280601361 > lab-06 > monitor > \lab-06 sudo python monitor.py 16:54:21 [491/491]  
[sudo] password for kaaru:  
System monitor: Starting system monitoring...  
CPU: Usage: 0.0%  
Memory: Usage: 53.5%  
System info: Hostname: fedora  
System info: Operating system: Linux 6.14.8-300.fc42.x86_64  
System info: Python version: 3.13.3  
Network: Bytes Sent: 19084612, Bytes Received: 198911138  
Software: Running software:  
Software: PID: 1, Name: systemd, Username: root  
Software: PID: 2, Name: kthreadd, Username: root  
Software: PID: 3, Name: pool_workqueue_release, Username: root  
Software: PID: 4, Name: kworker/R-rcu_gp, Username: root  
Software: PID: 5, Name: kworker/R-sync_wq, Username: root  
Software: PID: 6, Name: kworker/R-kvfree_rcu_reclaim, Username: root  
Software: PID: 7, Name: kworker/R-slub_flushwq, Username: root  
Software: PID: 8, Name: kworker/R-netsns, Username: root  
Software: PID: 10, Name: kworker/0:0H-events_highpri, Username: root  
Software: PID: 13, Name: kworker/R-mm_percpu_wq, Username: root  
Software: PID: 15, Name: rcu_tasks_kthread, Username: root  
Software: PID: 16, Name: rcu_tasks_rude_kthread, Username: root  
Software: PID: 17, Name: rcu_tasks_trace_kthread, Username: root  
Software: PID: 18, Name: ksoftirqd/0, Username: root  
Software: PID: 19, Name: rcu_preempt, Username: root  
Software: PID: 20, Name: rcu_exp_par_gp_kthread_worker/0, Username: root  
Software: PID: 21, Name: rcu_exp_gp_kthread_worker, Username: root  
Software: PID: 22, Name: migration/0, Username: root  
Software: PID: 23, Name: idle_inject/0, Username: root
```

```
1 nvim 2 lab-06/monitor 3 lazygit
```

## monitor-bot.py

