

---

## Table of Contents

Extra Credit .....	1
Clear Everything .....	1
Log the time program starts .....	1
Add the encrypted message .....	1
Add the base point for key .....	1
Create a location to fall back on when executing .....	1
Test algorithm with key .....	2

## Extra Credit

%-----

## Clear Everything

```
clear
clf
close all
clc
```

## Log the time program starts

```
startTime = clock;
```

## Add the encrypted message

```
encodedMessage = [
    [25, -33, -53],;
    [27, -31, -84],;
    [8, -23, 40],;
    [-15, 15, 44],;
    [6, -31, 107],;
    [15, -30, 24]
];
```

## Add the base point for key

```
key = [
    [-4 -4 -4],;
    [-4 -4 -4],;
    [-4 -4 -4]
];
```

## Create a location to fall back on when executing

```
keySize = length(key);
```

---

```
depth = 4;
x = keySize ^ 2;
```

## Test algorithm with key

The first key does not need to be tested because it is singular anyways

```
while x > 0
    value = key(x);
    if value >= depth
        key(x) = -depth;
        x = x - 1;
    else
        key(x) = value + 1;
        testKey(key, encodedMessage, startTime);
        x = keySize ^ 2;
    end
end
```

Key

-2	3	1
1	-1	-4
2	-4	4

Inverse of Key

-10.0000	-8.0000	-5.5000
-6.0000	-5.0000	-3.5000
-1.0000	-1.0000	-0.5000

Message

ARD WBRKPPAHS VFFJ

Found after 809.274 seconds

~~~~~

Key

|    |    |    |
|----|----|----|
| -2 | 3  | 1  |
| 2  | -4 | 4  |
| 1  | -1 | -4 |

Inverse of Key

|          |         |         |
|----------|---------|---------|
| -10.0000 | -5.5000 | -8.0000 |
| -6.0000  | -3.5000 | -5.0000 |
| -1.0000  | -0.5000 | -1.0000 |

Message

ADR BWRPKPHASV FJF

Found after 840.611 seconds

~~~~~

Key

-1	1	3
1	-2	2
1	-1	-4

---

Inverse of Key

-10	-1	-8
-6	-1	-5
-1	0	-1

Message

AHR DWROKP ASY FOF

Found after 1113.24 seconds

~~~~~

Key

|    |    |    |
|----|----|----|
| -1 | 1  | 3  |
| 1  | -1 | -4 |
| 1  | -2 | 2  |

Inverse of Key

|     |    |    |
|-----|----|----|
| -10 | -8 | -1 |
| -6  | -5 | -1 |
| -1  | -1 | 0  |

Message

ARH WDRKOPA S YFFO

Found after 1113.29 seconds

~~~~~

Key

-1	1	3
1	-1	-4
2	-4	4

Inverse of Key

-10.0000	-8.0000	-0.5000
-6.0000	-5.0000	-0.5000
-1.0000	-1.0000	0

Message

ARD WBRKGPA S LFFG

Found after 1117.44 seconds

~~~~~

Key

|    |    |    |
|----|----|----|
| -1 | 1  | 3  |
| 2  | -4 | 4  |
| 1  | -1 | -4 |

Inverse of Key

|          |         |         |
|----------|---------|---------|
| -10.0000 | -0.5000 | -8.0000 |
| -6.0000  | -0.5000 | -5.0000 |
| -1.0000  | 0       | -1.0000 |

Message

ADR BWRGKP ASL FGF

Found after 1147.51 seconds

---

~~~~~  
Key

1	-1	-4
-2	3	1
2	-4	4

Inverse of Key

-8.0000	-10.0000	-5.5000
-5.0000	-6.0000	-3.5000
-1.0000	-1.0000	-0.5000

Message

RADW BKRPAFH SVFFJ

Found after 1667.66 seconds

~~~~~  
Key

|    |    |    |
|----|----|----|
| 1  | -2 | 2  |
| -1 | 1  | 3  |
| 1  | -1 | -4 |

Inverse of Key

|    |     |    |
|----|-----|----|
| -1 | -10 | -8 |
| -1 | -6  | -5 |
| 0  | -1  | -1 |

Message

HARD WORK PAYS OFF

Found after 1698.44 seconds

~~~~~  
Key

1	-1	-4
-1	1	3
1	-2	2

Inverse of Key

-8	-10	-1
-5	-6	-1
-1	-1	0

Message

RAHW DKROAP SYFFO

Found after 1698.93 seconds

~~~~~  
Key

|    |    |    |
|----|----|----|
| 1  | -1 | -4 |
| -1 | 1  | 3  |
| 2  | -4 | 4  |

Inverse of Key

|         |          |         |
|---------|----------|---------|
| -8.0000 | -10.0000 | -0.5000 |
| -5.0000 | -6.0000  | -0.5000 |

---

-1.0000    -1.0000       0

Message

RADW BKRGA P SLFFG

Found after 1703.07 seconds

~~~~~

Key

1	-2	2
1	-1	-4
-1	1	3

Inverse of Key

-1	-8	-10
-1	-5	-6
0	-1	-1

Message

HRADW OKR APY SOFF

Found after 1761.75 seconds

~~~~~

Key

|    |    |    |
|----|----|----|
| 1  | -1 | -4 |
| 1  | -2 | 2  |
| -1 | 1  | 3  |

Inverse of Key

|    |    |     |
|----|----|-----|
| -8 | -1 | -10 |
| -5 | -1 | -6  |
| -1 | 0  | -1  |

Message

RHAWD KORA P YSFOF

Found after 1762.15 seconds

~~~~~

Key

1	-1	-4
2	-4	4
-2	3	1

Inverse of Key

-8.0000	-5.5000	-10.0000
-5.0000	-3.5000	-6.0000
-1.0000	-0.5000	-1.0000

Message

RDAWB KPRAHP VSFJF

Found after 1793.67 seconds

~~~~~

Key

|   |    |    |
|---|----|----|
| 1 | -1 | -4 |
|---|----|----|

---

|    |    |   |
|----|----|---|
| 2  | -4 | 4 |
| -1 | 1  | 3 |

Inverse of Key

|         |         |          |
|---------|---------|----------|
| -8.0000 | -0.5000 | -10.0000 |
| -5.0000 | -0.5000 | -6.0000  |
| -1.0000 | 0       | -1.0000  |

Message

RDAWB KGRA P LSFGF

Found after 1797.5 seconds

~~~~~

Key

2	-4	4
-2	3	1
1	-1	-4

Inverse of Key

-5.5000	-10.0000	-8.0000
-3.5000	-6.0000	-5.0000
-0.5000	-1.0000	-1.0000

Message

DARB WPRKHPAVS JFF

Found after 1968.57 seconds

~~~~~

Key

|    |    |    |
|----|----|----|
| 2  | -4 | 4  |
| -1 | 1  | 3  |
| 1  | -1 | -4 |

Inverse of Key

|         |          |         |
|---------|----------|---------|
| -0.5000 | -10.0000 | -8.0000 |
| -0.5000 | -6.0000  | -5.0000 |
| 0       | -1.0000  | -1.0000 |

Message

DARB WGRK PALS GFF

Found after 2002.48 seconds

~~~~~

Key

2	-4	4
1	-1	-4
-2	3	1

Inverse of Key

-5.5000	-8.0000	-10.0000
-3.5000	-5.0000	-6.0000
-0.5000	-1.0000	-1.0000

Message

---

*DRABW PKRHAPV SJFF*

*Found after 2060.98 seconds*

~~~~~

*Key*

|    |    |    |
|----|----|----|
| 2  | -4 | 4  |
| 1  | -1 | -4 |
| -1 | 1  | 3  |

*Inverse of Key*

|         |         |          |
|---------|---------|----------|
| -0.5000 | -8.0000 | -10.0000 |
| -0.5000 | -5.0000 | -6.0000  |
| 0       | -1.0000 | -1.0000  |

*Message*

*DRABW GKR APL SGFF*

*Found after 2064.77 seconds*

~~~~~

*Published with MATLAB® R2020a*