Project 4

May 7, 2020

[2]:
```
# Import numpy.
import numpy as np
from random import randint
```

[22]:
```
A = np.zeros([3,3])
while np.linalg.det(A)==0:
    A = np.random.randint(0,10,(3,3))
```

[23]:
```
A
```

[23]:
```
array([[6, 2, 5],
       [8, 1, 5],
       [4, 7, 0]])
```

[33]:
```
#RON LOVES HERMIONE
#01234567891011121314151617181920212223242526
# ABCDEFGHIJ K L M N O P Q R S T U V W X Y Z
B = np.array([[18,15,14,0,12,15],[22,5,19,0,8,5],[18,13,9,15,14,5]])
B
```

[33]:
```
array([[18, 15, 14,  0, 12, 15],
       [22,  5, 19,  0,  8,  5],
       [18, 13,  9, 15, 14,  5]])
```

[34]:
```
#Multiply matrix A and matrix B
AB = A.dot(B)
AB
```

[34]:
```
array([[242, 165, 167,  75, 158, 125],
       [256, 190, 176,  75, 174, 150],
       [226,  95, 189,   0, 104,  95]])
```

[32]:
```
#Kyra Kemp
kyra = np.array([[5,3,6],[2,0,5],[2,2,0]])
kemp = np.array([[15,265,133,205,105],[0,171,91,115,36],[10,46,18,46,46]])
CInverse = np.linalg.inv(kyra)
CDecode = np.matmul(CInverse, kemp)
```

```
np.set_printoptions(precision=2)
print
print(kyra)
print(kemp)
print(CInverse)
print(np.around(CDecode, 0))
```

```
[[5 3 6]
 [2 0 5]
 [2 2 0]]
[[ 15 265 133 205 105]
 [  0 171  91 115  36]
 [ 10  46  18  46  46]]
[[-2.5   3.    3.75]
 [ 2.5  -3.   -3.25]
 [ 1.   -1.   -1.5 ]]
[[-0. 23.  8.  5. 18.]
 [ 5.  0.  1. 18.  5.]
 [ 0. 25. 15. 21.  0.]]
```

[33]:
```
#01234567891011121314151617181920212223242526
# ABCDEFGHIJ K L M N O P Q R S T U V W X Y Z
#0,23,8,5,18,5,0,1,18,5,0,25,15,21,0
# WHERE A RE YOU
```

[34]:
```
#Michael Pawlenko
michael = np.array([[5,5,0],[0,3,7],[1,8,6]])
pawlenko = np.array([[20,100,115,50],[35,155,30,62],[34,237,62,103]])
DInverse = np.linalg.inv(michael)
DDecode = np.matmul(DInverse, pawlenko)
np.set_printoptions(precision=2)
print
print(michael)
print(pawlenko)
print(DInverse)
print(np.around(DDecode, 0))
```

```
[[5 5 0]
 [0 3 7]
 [1 8 6]]
[[ 20 100 115  50]
 [ 35 155  30  62]
 [ 34 237  62 103]]
[[ 0.25  0.19 -0.23]
 [-0.05 -0.19  0.23]
 [ 0.02  0.23 -0.1 ]]
[[ 4.  1. 20.  1.]
```

```
[-0. 19.  3.  9.]
[ 5. 14.  3.  5.]]
```

[35]:
```
#01234567891011121314151617181920212223242526
# ABCDEFGHIJ K L M N O P Q R S T U V W X Y Z
#4,1,20,1,0,19,3,9,5,14,3,5
#DATA SCIENCE
```

[36]:
```
#Mashall Jahangir
mashall = np.array([[0,1,0],[0,8,7],[2,0,0]])
jahangir = np.
 ↪array([[15,13,5,0,19,20],[127,279,173,7,194,195],[38,40,2,50,0,16]])
EInverse = np.linalg.inv(mashall)
EDecode = np.matmul(EInverse, jahangir)
np.set_printoptions(precision=2)
print
print(mashall)
print(jahangir)
print(EInverse)
print(np.around(EDecode, 0))
```

```
[[0 1 0]
 [0 8 7]
 [2 0 0]]
[[ 15  13   5   0  19  20]
 [127 279 173   7 194 195]
 [ 38  40   2  50   0  16]]
[[ 0.00e+00  0.00e+00  5.00e-01]
 [ 1.00e+00  6.94e-18  0.00e+00]
 [-1.14e+00  1.43e-01 -0.00e+00]]
[[19. 20.  1. 25.  0.  8.]
 [15. 13.  5.  0. 19. 20.]
 [ 1. 25. 19.  1.  6.  5.]]
```

[37]:
```
#01234567891011121314151617181920212223242526
# ABCDEFGHIJ K L M N O P Q R S T U V W X Y Z
#19,20,1,25,0,8,15,13,5,0,19,20,1,25,19,1,6,5
#STAY HOME STAYSAFE
```

[38]:
```
#Timothy Chatman
timothy = np.array([[3,1,1],[7,5,4],[2,3,4]])
chatman = np.
 ↪array([[15,64,41,103,10,23,72,36,27],[42,186,149,337,45,105,198,139,116],[18,101,74,202,35,
FInverse = np.linalg.inv(timothy)
FDecode = np.matmul(FInverse, chatman)
np.set_printoptions(precision=2)
print
```

```
print(timothy)
print(chatman)
print(FInverse)
print(np.around(FDecode, 0))
```

```
[[3 1 1]
 [7 5 4]
 [2 3 4]]
[[ 15  64  41 103  10  23  72  36  27]
 [ 42 186 149 337  45 105 198 139 116]
 [ 18 101  74 202  35  64 108  74 100]]
[[ 0.53 -0.07 -0.07]
 [-1.33  0.67 -0.33]
 [ 0.73 -0.47  0.53]]
[[ 4. 15.  7. 19. -0.  1. 18.  5. -0.]
 [ 2.  5. 20. 20.  5. 18.  0. 20.  8.]
 [ 1. 14.  0. 26.  5.  2. 18.  1. 19.]]
```

[39]:
```
#01234567891011121314151617181920212223242526
# ABCDEFGHIJ K L M N O P Q R S T U V W X Y Z
#4,15,7,19,0,1,18,5,0,2,5,20,20,5,18,0,20,8,1,14,0,26,5,2,18,1,19
#DOGS ARE BETTER THAN ZEBRAS
```

[40]:
```
#Jordan Bickelhaupt
jordan = np.array([[6,5,7],[5,9,9],[8,7,2]])
bickelhaupt = np.array([[276,175,154,177],[353,170,160,248],[233,235,132,107]])
GInverse = np.linalg.inv(jordan)
GDecode = np.matmul(GInverse, bickelhaupt)
np.set_printoptions(precision=2)
print
print(jordan)
print(bickelhaupt)
print(GInverse)
print(np.around(GDecode, 0))
```

```
[[6 5 7]
 [5 9 9]
 [8 7 2]]
[[276 175 154 177]
 [353 170 160 248]
 [233 235 132 107]]
[[ 0.21 -0.18  0.08]
 [-0.28  0.2   0.09]
 [ 0.17  0.01 -0.13]]
[[13. 25. 14.  1.]
 [13.  5. -0.  9.]
 [19.  0. 10. 18.]]
```

[41]:
```
#01234567891011121314151617181920212223242526
# ABCDEFGHIJ K L M N O P Q R S T U V W X Y Z
#13,25,14,1,13,5,0,9,19,0,10,18
#MYNAME IS JR
```

[42]:
```
#Danyah Khan
danyah = np.array([[6,3,2],[7,1,4],[1,8,9]])
khan = np.array([[61,6,182,59,59],[77,7,184,48,103],[61,1,170,86,249]])
IInverse = np.linalg.inv(danyah)
IDecode = np.matmul(IInverse, khan)
np.set_printoptions(precision=2)
print
print(danyah)
print(khan)
print(IInverse)
print(np.around(IDecode, 0))
```

```
[[6 3 2]
 [7 1 4]
 [1 8 9]]
[[ 61   6 182  59  59]
 [ 77   7 184  48 103]
 [ 61   1 170  86 249]]
[[ 0.11  0.05 -0.05]
 [ 0.29 -0.25  0.05]
 [-0.27  0.22  0.07]]
[[ 8.  1. 22.  5.  0.]
 [ 1.  0. 14.  9.  3.]
 [ 5. -0.  4.  1. 25.]]
```

[43]:
```
#01234567891011121314151617181920212223242526
# ABCDEFGHIJ K L M N O P Q R S T U V W X Y Z
#8,1,22,5,0,1,0,14,9,3,5,0,4,1,25
#HAVE A NICE DAY
```

[ ]:
```

```