Exercise 1

```python
import numpy as np
locker_list = list(range(1,101))
lockers=np.zeros(len(locker_list),dtype=bool)
for i in range(1,len(lockers)+1):
    for j in range(i,len(lockers)+1,i):
        lockers[j-1]=not lockers[j-1] #j-1 since i starts at 1
print(lockers)
pos=1
for i in range(1,len(lockers)+1):
    if i==1:
        if lockers[i-1]:
            print(i)
    if i==100:
        break
    if lockers[i]:
        print(i+1)
```

```
1
4
9
16
25
36
49
64
81
100
raulrodriguez@Rauls-MacBook-Air WorkSpaceVSPython %
```

Exercise 2

```python
import numpy as np
message=input("Enter messsage: ")
message=message.upper()
print(message)
chars=[ord(i)-32 if i==" " else ord(i)-64 for i in message]
while len(chars)%3!=0:
    chars.append(0)
#print(chars)
nums=[]
for i in range(len(chars)):
    if i%3==0:
        nums.append(chars[i:i+3])
nums=np.array(nums)
#print(nums)
A=np.array([[1,-2,2],
    [-1,1,3],
    [1,-1,-4]])
encoded=np.matmul(nums,A)
print(f'encoded message {encoded.flatten()}')
Ainv=np.linalg.inv(A)
Ainv=Ainv.astype(int)
#print(Ainv)
decoded=np.matmul(encoded,Ainv)
#print(decoded)
decoded=decoded.flatten()
message2=[chr(i+32) if i==0 else chr(i+64) for i in decoded]
print(f'decoded message {"".join(message2)}')
```

```
s/raulrodriguez/Documents/WorkSpaceVSPython/HW1_2ML.py
Enter messsage: meet me monday
MEET ME MONDAY
encoded message [ 13 -26  21  33 -53 -12  18 -23 -42   5 -20  56 -24  23  77]
decoded message MEET ME MONDAY
raulrodriguez@Rauls-MacBook-Air WorkSpaceVSPython %
```