

מבוא לתכנות מדעי פיתון  
תרגיל בית 7  
שותפים: נימר נסייר 322626896  
פאטמה נעמה 212100582

שאלה 1:

Link: [https://py3.codeskulptor.org/#user306\\_i3Ybeyg7R2DQPTw\\_0.py](https://py3.codeskulptor.org/#user306_i3Ybeyg7R2DQPTw_0.py)

```
#Question 1
#first read the file
f=open("grades.txt","r")
# make a sum,counter,max,min,and students above 88
sum1=0
counter=0
max1=0
min1=0
students88=0
# go over each line in the file
for line in f:
    #split the line into to pieces, we need the second one
    x=line.split()
    # add all the marks
    sum1+=int(x[1])
    # counter to get the average
    counter+=1
    #func to get maximum number
    num=int(x[1])
    if max1<num:
        max1=num
    #func to get minimum number
    if min1>num:
        min1=num
    # check how many students are above 88
    if int(x[0])>88:
        students88+=1
print("The average mark is:",sum1/counter)
print("The minimum mark is:",min1)
print("The maximum mark is:",max1)
print("There are",students88,"students above the mark of 88")
f.close()
```

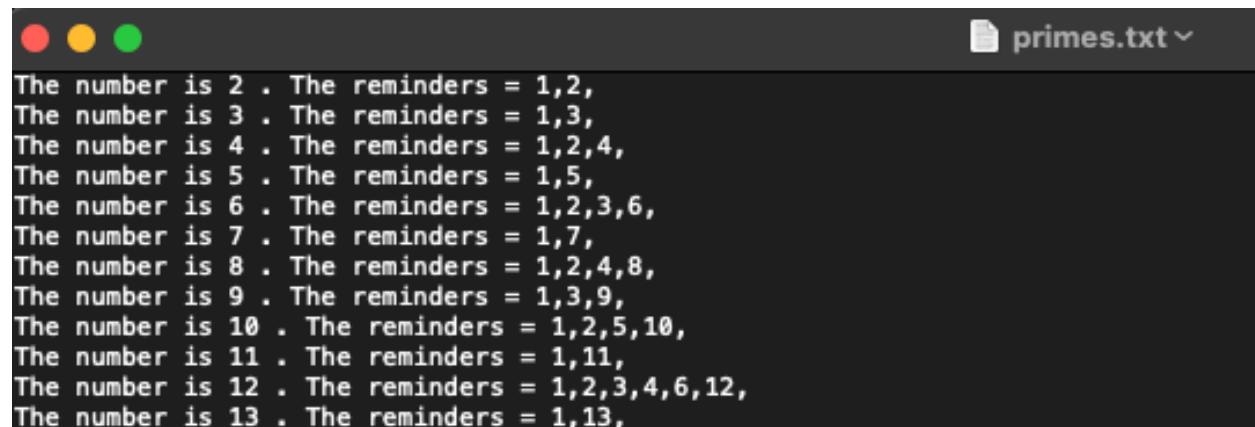
```
(IPdb [40]): runfile('/Users/nemernser/.spyder-py3/
Question 1.py', wdir='/Users/nemernser/.spyder-py3')
The average mark is: 49.829
The minimum mark is: 0
The maximum mark is: 100
There are 1000 students above the mark of 88
```

שאלה 2:

Link: [https://py3.codeskulptor.org/#user306\\_i3Ybeyg7R2DQPTw\\_1.py](https://py3.codeskulptor.org/#user306_i3Ybeyg7R2DQPTw_1.py)

```
#Question 2
#open a file
f_write=open("primes.txt","w")
# make a list for the remainders
listst=[]
#for from 2 to 1000
for i in range(2,1001):
    #basic writing for the file and the number which is i
    f_write.write("The number is "+str(i)+" . ")
    f_write.write("The reminders = ")
    #check all the numbers that can be devided by i
    for j in range(1,i+1):
        #if they are reminders we add them to the list
        if i%j==0:
            listst.append(j)
    # for to go over all the elements in the list
    for element in listst:
        #write all the numbers
        f_write.write(str(element)+",")
    f_write.write("\n")
    # clear the list for another number
    listst=[]
f_write.close()
```

למשל 3 תמונות:



```
The number is 2 . The reminders = 1,2,
The number is 3 . The reminders = 1,3,
The number is 4 . The reminders = 1,2,4,
The number is 5 . The reminders = 1,5,
The number is 6 . The reminders = 1,2,3,6,
The number is 7 . The reminders = 1,7,
The number is 8 . The reminders = 1,2,4,8,
The number is 9 . The reminders = 1,3,9,
The number is 10 . The reminders = 1,2,5,10,
The number is 11 . The reminders = 1,11,
The number is 12 . The reminders = 1,2,3,4,6,12,
The number is 13 . The reminders = 1,13,
```

```
The number is 178 . The reminders = 1,2,89,178,  
The number is 179 . The reminders = 1,179,  
The number is 180 . The reminders = 1,2,3,4,5,6,9,10,12,15,18,20,30,36,45,60,90,180,  
The number is 181 . The reminders = 1,181,  
The number is 182 . The reminders = 1,2,7,13,14,26,91,182,  
The number is 183 . The reminders = 1,3,61,183,  
The number is 184 . The reminders = 1,2,4,8,23,46,92,184,  
The number is 185 . The reminders = 1,5,37,185,  
The number is 186 . The reminders = 1,2,3,6,31,62,93,186,  
The number is 187 . The reminders = 1,11,17,187,  
The number is 188 . The reminders = 1,2,4,47,94,188,  
The number is 189 . The reminders = 1,3,7,9,21,27,63,189,  
The number is 190 . The reminders = 1,2,5,10,19,38,95,190,  
The number is 191 . The reminders = 1,191,  
The number is 192 . The reminders = 1,2,3,4,6,8,12,16,24,32,48,64,96,192,  
The number is 193 . The reminders = 1,193,  
The number is 194 . The reminders = 1,2,97,194,  
The number is 195 . The reminders = 1,3,5,13,15,39,65,195,
```

primes.txt

```
The number is 639 . The reminders = 1,3,9,71,213,639,  
The number is 640 . The reminders = 1,2,4,5,8,10,16,20,32,40,64,80,128,160,320,640,  
The number is 641 . The reminders = 1,641,  
The number is 642 . The reminders = 1,2,3,6,107,214,321,642,  
The number is 643 . The reminders = 1,643,  
The number is 644 . The reminders = 1,2,4,7,14,23,28,46,92,161,322,644,  
The number is 645 . The reminders = 1,3,5,15,43,129,215,645,  
The number is 646 . The reminders = 1,2,17,19,34,38,323,646,  
The number is 647 . The reminders = 1,647,  
The number is 648 . The reminders = 1,2,3,4,6,8,9,12,18,24,27,36,54,72,81,108,162,216,324,648,  
The number is 649 . The reminders = 1,11,59,649,  
The number is 650 . The reminders = 1,2,5,10,13,25,26,50,65,130,325,650,  
The number is 651 . The reminders = 1,3,7,21,31,93,217,651
```

```
#Question 3
def CheckLists(list1,list2):
    #counter and length of the two lists
    counter=0
    length1=len(list1)
    length2=len(list2)
    # get the min length because we dont have to check more
    godel=min(length1,length2)
    for i in range(godel):
        # if there are two equal elements in the same place
        if list1[i]==list2[i]:
            counter+=1
    return counter
A=[1,2,3,'4']
B=[1,'c']
print("There are:",CheckLists(A,B))
A=['a',3,'t',5]
B=['t','a',3]
print("There are:",CheckLists(A,B))
```

```
(IPdb [42]): runfile('/User
question3.py', wdir='/Users
There are: 1
There are: 0
```

שאלה 4:

Link: [https://py3.codeskulptor.org/#user306\\_i3Ybeyg7R2DQPTw\\_3.py](https://py3.codeskulptor.org/#user306_i3Ybeyg7R2DQPTw_3.py)

```
#Question 4
n=int(input("Please enter n: "))
def FlbList(n):
    #The Fibonacci sequence is a number series where each
    #element is the sum of the previous two elements, starting from 0 and 1
    #as requested
    seq=[0,1]
    #add last two numbers in seq
    for i in range(2,n):
        numnext=seq[-1] + seq[-2]
        seq.append(numnext)
    #return numbers
    return seq
print("The fibonacci list with ",n,"numbers is",FlbList(n))
```

למשל 20 n

```
Please enter n: 20
The fibonacci list with 20 numbers is [0, 1, 1, 2, 3, 5,
8, 13, 21, 34, 55, 89, 144, 233, 377, 610, 987, 1597,
2584, 4181]
(IPdb [44]):
```

למשל 5 n

```
Please enter n: 5
The fibonacci list with 5 numbers is [0, 1, 1, 2, 3]
```

Link: [https://py3.codeskulptor.org/#user306\\_i3Ybeyg7R2DQPTw\\_4.py](https://py3.codeskulptor.org/#user306_i3Ybeyg7R2DQPTw_4.py)

```
import random
def prob(N,p):
    #fill the list from 1 to N people
    listp=[]
    counter_p=0
    for i in range(1,N+1):
        listp.append(i)
    # 1/N probability
    person=random.choice(listp)
    #lets check if a person caught the ball or not
    for i in range(10000):
        simulate_c=1

        #make a list with zeros to check if they all caught the ball
        ListZero=[0]*N
        #pick in a random order another person
        person=random.choice(listp)
        #get probability
        #change his place in the list to 1 so we know when everyone caught the ball
        ListZero[person-1]=1
        #keep going until everyone catches the ball or 100 passed have passed
        while sum(ListZero)!=N and simulate_c<=100:
            #grab a random person
            probability=random.choice(listp)
            # check his probability
            if random.random()<=p:
                #change his place to 1
                ListZero[probability-1]=1
            else:
                break
            #passed 1
            simulate_c+=1
        #same checking if we passed we add 1
        if sum(ListZero)==N and simulate_c<=100:
            passed=1
        else:
            passed=0
        counter_p+=passed

    num=counter_p/10000

    return num
```

```
print("Simulation finished, probability in 10k simulations is:",prob(6,0.97))
```

```
#now for question 7
```

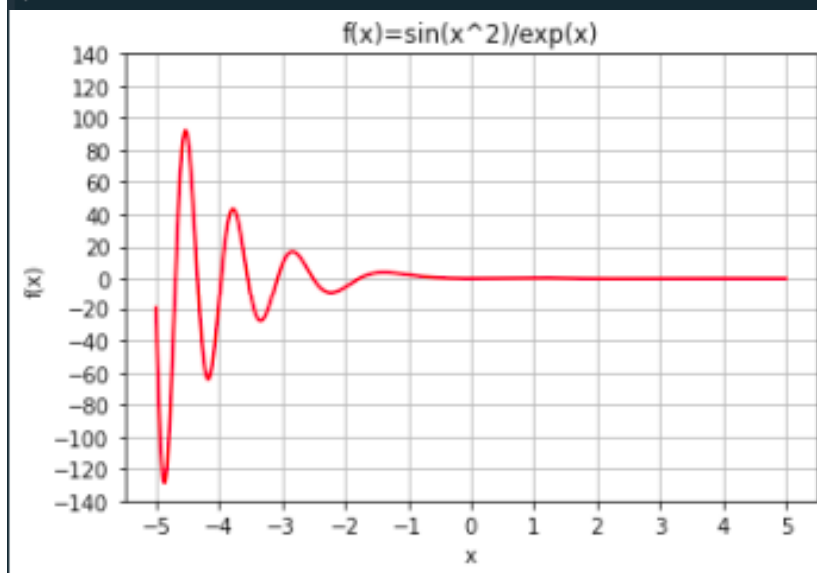
```
Question 5.py', wdir='/users/nemernser/.spyder-py3')
```

```
Simulation finished, probability in 10k simulations is:
0.6794
```

Link: [https://py3.codeskulptor.org/#user306\\_VoPlbKslNX\\_0.py](https://py3.codeskulptor.org/#user306_VoPlbKslNX_0.py)

```
import matplotlib.pyplot as plt
import math
# Using ourrange function introduced in class
def ourrange(start,stop,step=1):
    rez_range=[]
    if stop<start:
        return rez_range
    rez_range.append(start)
    while True:
        if rez_range[-1]+step<stop:
            rez_range.append(rez_range[-1]+step)
        else:
            break
    return rez_range

#using our function from class
x=ourrange(-5,5,0.001)
#empty list
y=[]
#get all elements from the function and add them to the list
for i in x:
    #add elements from the function to the list
    y.append(math.sin(i**2)/math.exp(i))
x_ax=[]
y_ax=[]
for j in range(-5,6,1):
    x_ax.append(j)
for w in range(-140,141,20):
    y_ax.append(w)
#drawing the graph...
plt.plot(x,y,color="red")
plt.grid()
plt.xlabel("x")
plt.ylabel("f(x)")
plt.xticks(x_ax)
plt.yticks(y_ax)
plt.title("f(x)=sin(x^2)/exp(x)")
plt.show()
```





שאלה 7:

Link: [https://py3.codeskulptor.org/#user306\\_yKNOh8Gb0E\\_0.py](https://py3.codeskulptor.org/#user306_yKNOh8Gb0E_0.py)

השתמשתי בפונקציה של שאלה 5 prob

```
import matplotlib.pyplot as plt
# Using ourrange function introduced in class
def ourrange(start, stop, step=1):
    rez_range=[]
    if stop<start:
        return rez_range
    rez_range.append(start)
    while True:
        if rez_range[-1]+step<stop:
            rez_range.append(rez_range[-1]+step)
        else:
            break
    return rez_range
#make a list
y=[]
#our function from class
# go from 2 to 15 as requesteede
x=ourrange(2, 16)
for i in x:
    #add all probabilities to the list
    y.append(prob(i,0.97))
#draw the graph...
x_ax=[]
for j in range(2,16):
    x_ax.append(j)
plt.plot(x,y,color="blue")
plt.xlabel("Number of players")
plt.ylabel("Probability of success")
plt.title("Probability of winning the game")
plt.xticks(x_ax)
plt.grid()
plt.show()
```

