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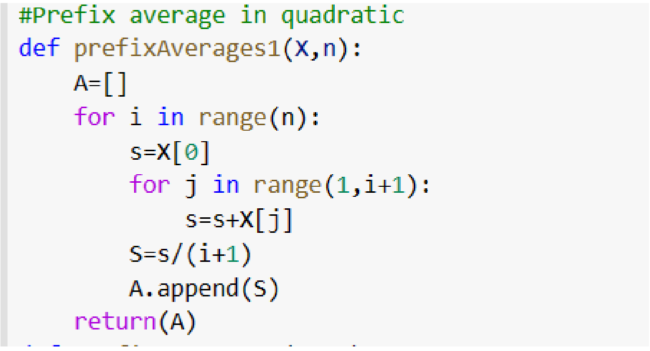
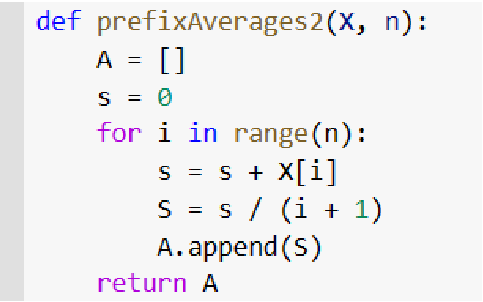
Assignment 1

1.Prefix Average in Quadratic

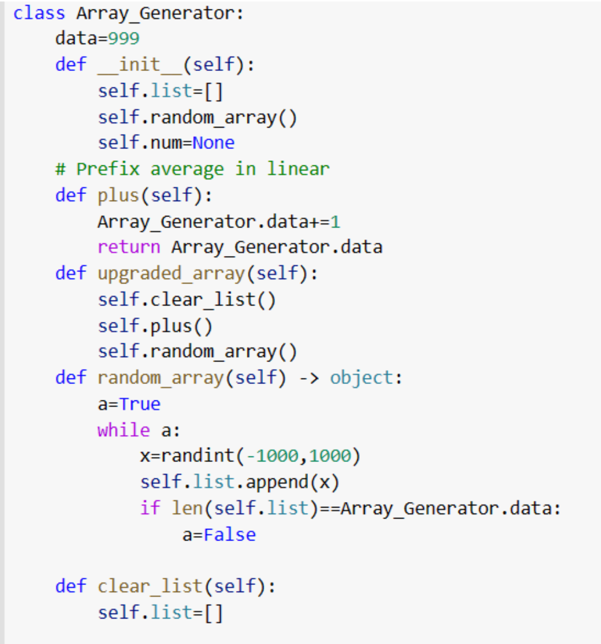


```
#Prefix average in quadratic
def prefixAverages1(X,n):
    A=[]
    for i in range(n):
        s=X[0]
        for j in range(1,i+1):
            s=s+X[j]
        S=s/(i+1)
        A.append(S)
    return(A)
```

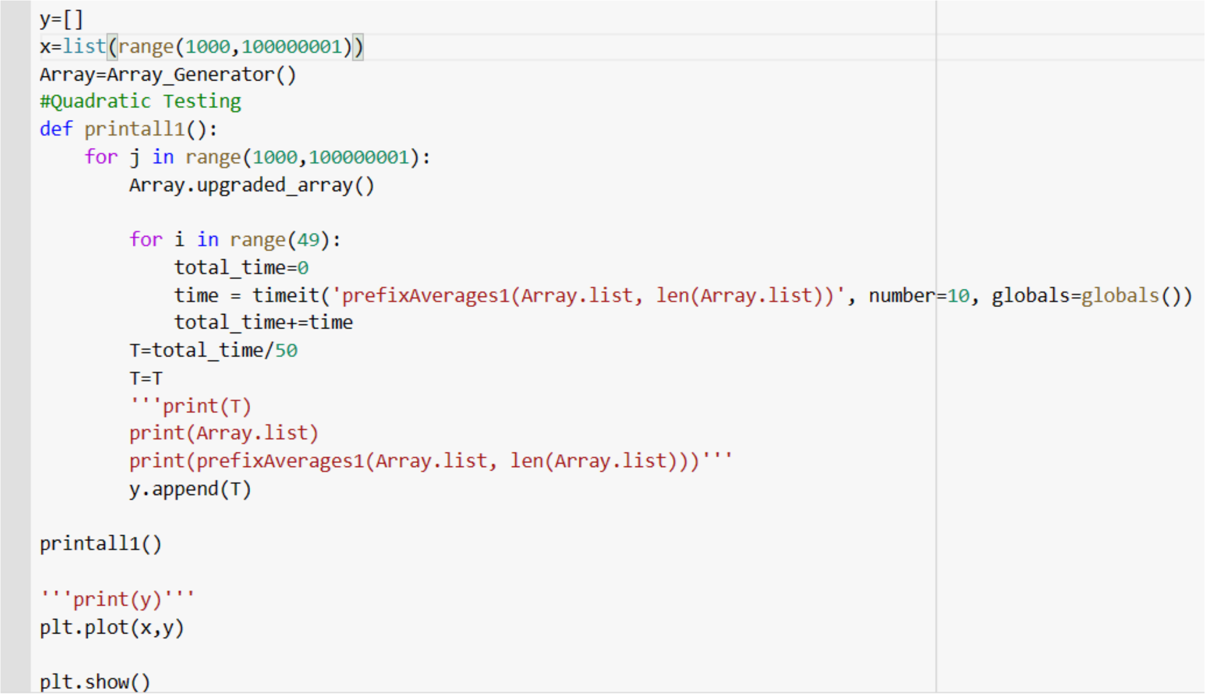
2.Prefix Average in Linear



```
def prefixAverages2(X, n):
    A = []
    s = 0
    for i in range(n):
        s = s + X[i]
        S = s / (i + 1)
        A.append(S)
    return A
```

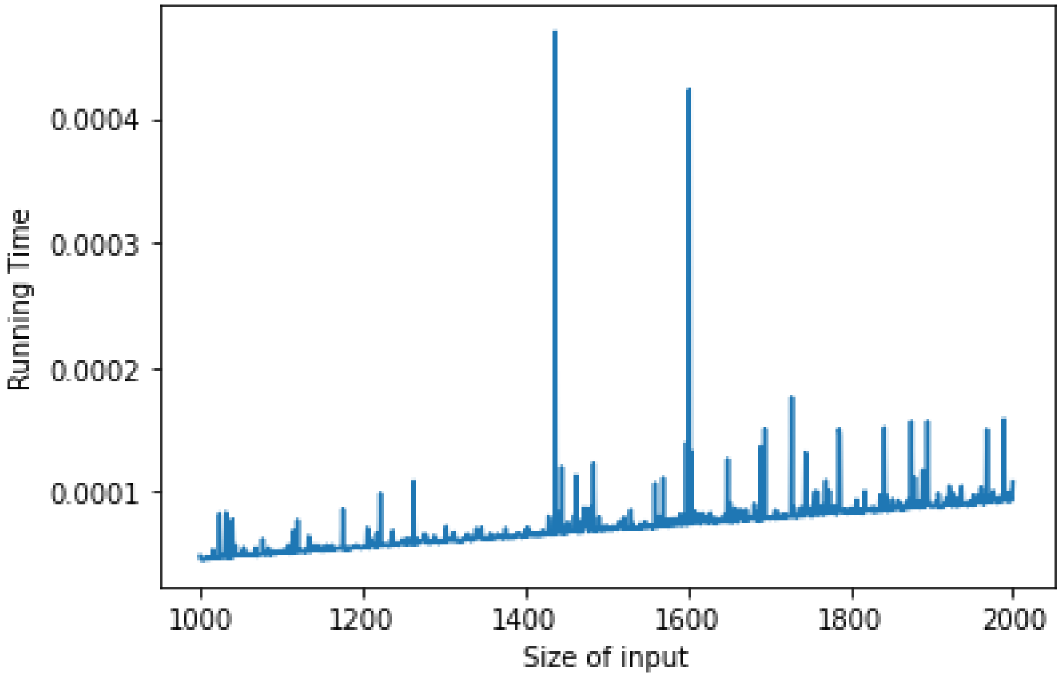


```
class Array_Generator:
    data=999
    def __init__(self):
        self.list=[]
        self.random_array()
        self.num=None
    # Prefix average in linear
    def plus(self):
        Array_Generator.data+=1
        return Array_Generator.data
    def upgraded_array(self):
        self.clear_list()
        self.plus()
        self.random_array()
    def random_array(self) -> object:
        a=True
        while a:
            x=randint(-1000,1000)
            self.list.append(x)
            if len(self.list)==Array_Generator.data:
                a=False

    def clear_list(self):
        self.list=[]
```

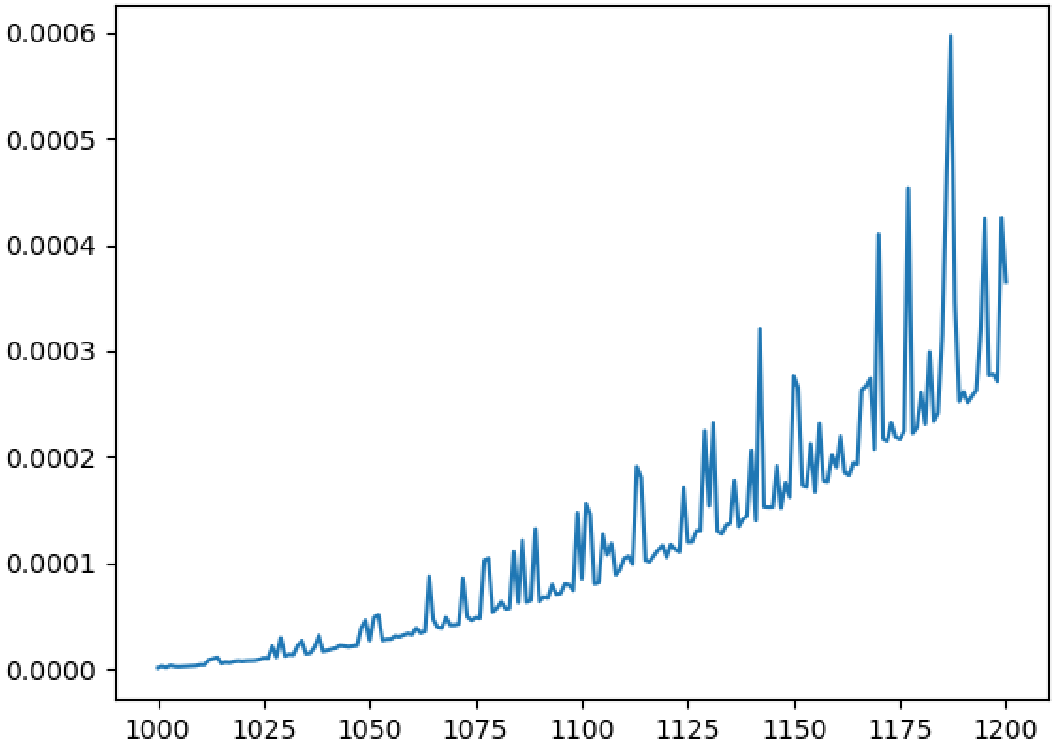


```
y=[]
x=list(range(1000,100000001))
Array=Array_Generator()
#Quadratic Testing
def printall1():
    for j in range(1000,100000001):
        Array.upgraded_array()

        for i in range(49):
            total_time=0
            time = timeit('prefixAverages1(Array.list, len(Array.list))', number=10, globals=globals())
            total_time+=time
        T=total_time/50
        T=T
        '''print(T)
        print(Array.list)
        print(prefixAverages1(Array.list, len(Array.list)))'''
        y.append(T)

printall1()

'''print(y)'''
plt.plot(x,y)

plt.show()
```

Prefix Average in Linear



Prefix Average in Quadratic



0.0006
0.0005
0.0004
0.0003
0.0002
0.0001
0.0000
1000
1025
1050
1075
1100
1125
1150
1175
1200