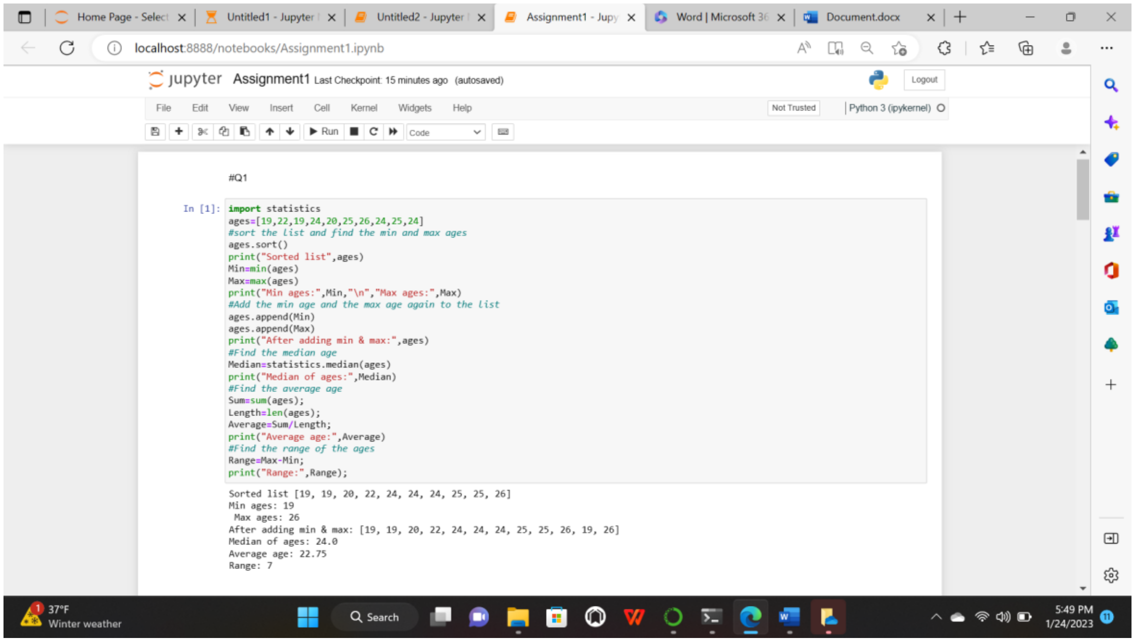
Question 1

- I have imported statistics library.
- The Input list is given, and it is sorted by using sort method.
- Min and Max methods are found and added to the ages list.
- The median of the list is found using the median method from statistics library.
- The average value of a list is calculated using sum of the elements of the list and length of the list.
- The range of the list is found using the difference between Min and Max values.



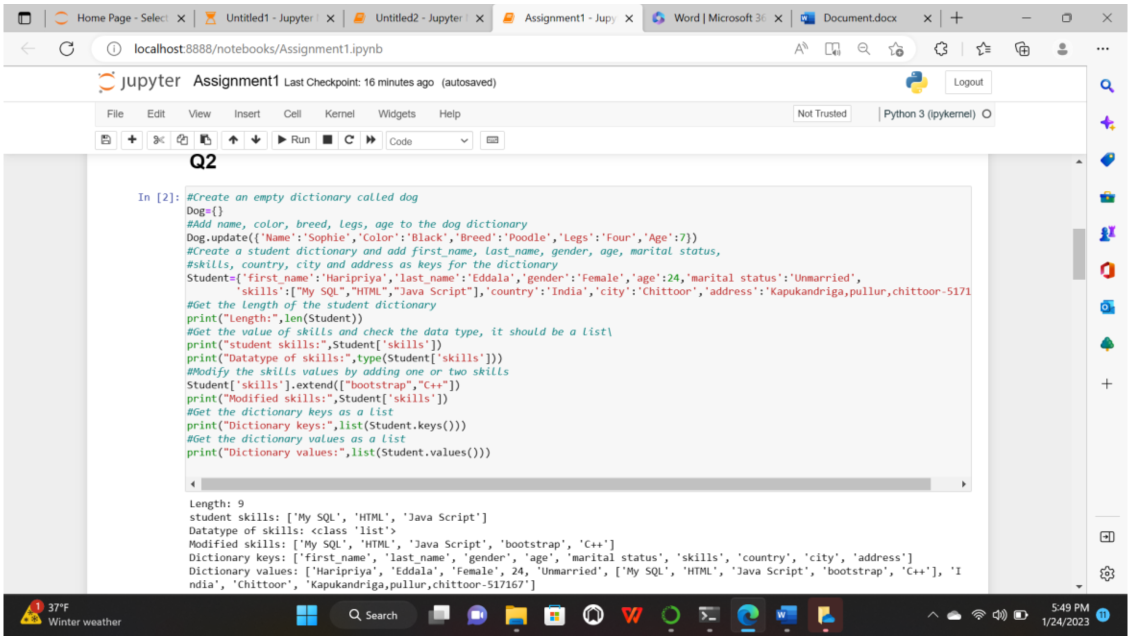
#Q1

In [1]:
```
import statistics
ages=[19,22,19,24,20,25,26,24,25,24]
#sort the list and find the min and max ages
ages.sort()
print("Sorted list",ages)
Min=min(ages)
Max=max(ages)
print("Min ages:",Min,"\n","Max ages:",Max)
#Add the min age and the max age again to the list
ages.append(Min)
ages.append(Max)
print("After adding min & max:",ages)
#Find the median age
Median=statistics.median(ages)
print("Median of ages:",Median)
#Find the average age
Sum=sum(ages);
Length=len(ages);
Average=Sum/Length;
print("Average age:",Average)
#Find the range of the ages
Range=Max-Min;
print("Range:",Range);
```

```
Sorted list [19, 19, 20, 22, 24, 24, 24, 25, 25, 26]
Min ages: 19
 Max ages: 26
After adding min & max: [19, 19, 20, 22, 24, 24, 24, 25, 25, 26, 19, 26]
Median of ages: 24.0
Average age: 22.75
Range: 7
```

Question 2

- Created an empty dictionary named ‘Dog’ and added keys and values according to the given input.
- Created a ‘Student’ dictionary with the keys and values as given in the input.
- Performed the operations such as length of the dictionary, accessing the values of dictionary using keys, modifying values



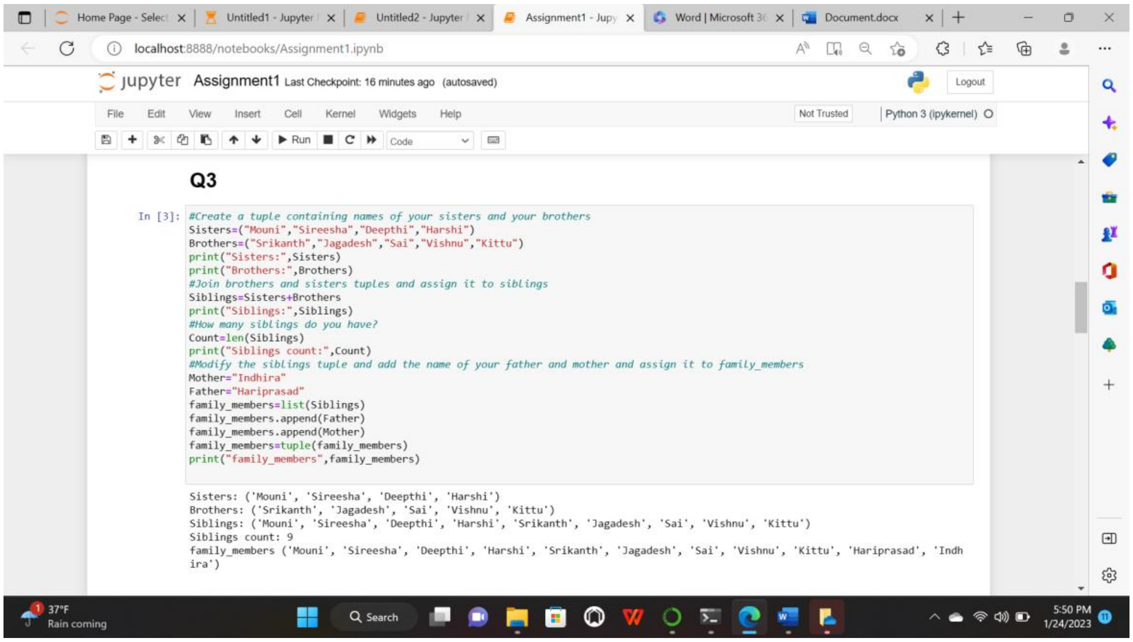
Q2

```
In [2]: #Create an empty dictionary called dog
Dog={}
#Add name, color, breed, legs, age to the dog dictionary
Dog.update({'Name':'Sophie','Color':'Black','Breed':'Poodle','Legs':'Four','Age':7})
#Create a student dictionary and add first_name, last_name, gender, age, marital status,
#skills, country, city and address as keys for the dictionary
Student={'first_name':'Haripriya','last_name':'Eddala','gender':'Female','age':24,'marital status':'Unmarried',
        'skills':["My SQL","HTML","Java Script"],'country':'India','city':'Chittoor','address':'Kapukandriga,pullur,chittoor-5171
#Get the length of the student dictionary
print("Length:",len(Student))
#Get the value of skills and check the data type, it should be a list\
print("student skills:",Student['skills'])
print("Datatype of skills:",type(Student['skills']))
#Modify the skills values by adding one or two skills
Student['skills'].extend(["bootstrap","C++"])
print("Modified skills:",Student['skills'])
#Get the dictionary keys as a list
print("Dictionary keys:",list(Student.keys()))
#Get the dictionary values as a list
print("Dictionary values:",list(Student.values()))
```

```
Length: 9
student skills: ['My SQL', 'HTML', 'Java Script']
Datatype of skills: <class 'list'>
Modified skills: ['My SQL', 'HTML', 'Java Script', 'bootstrap', 'C++']
Dictionary keys: ['first_name', 'last_name', 'gender', 'age', 'marital status', 'skills', 'country', 'city', 'address']
Dictionary values: ['Haripriya', 'Eddala', 'Female', 24, 'Unmarried', ['My SQL', 'HTML', 'Java Script', 'bootstrap', 'C++'], 'I
ndia', 'Chittoor', 'Kapukandriga,pullur,chittoor-517167']
```

Question 3

- Created two separate tuples named sisters and brothers with elements.
- Joined those two tuples and assigned it to the siblings tuple.
- Created two variables mother and father and assigned values to them.
- Created a list named family_members, assigned siblings (converted to list) to it and appended mother and father values.



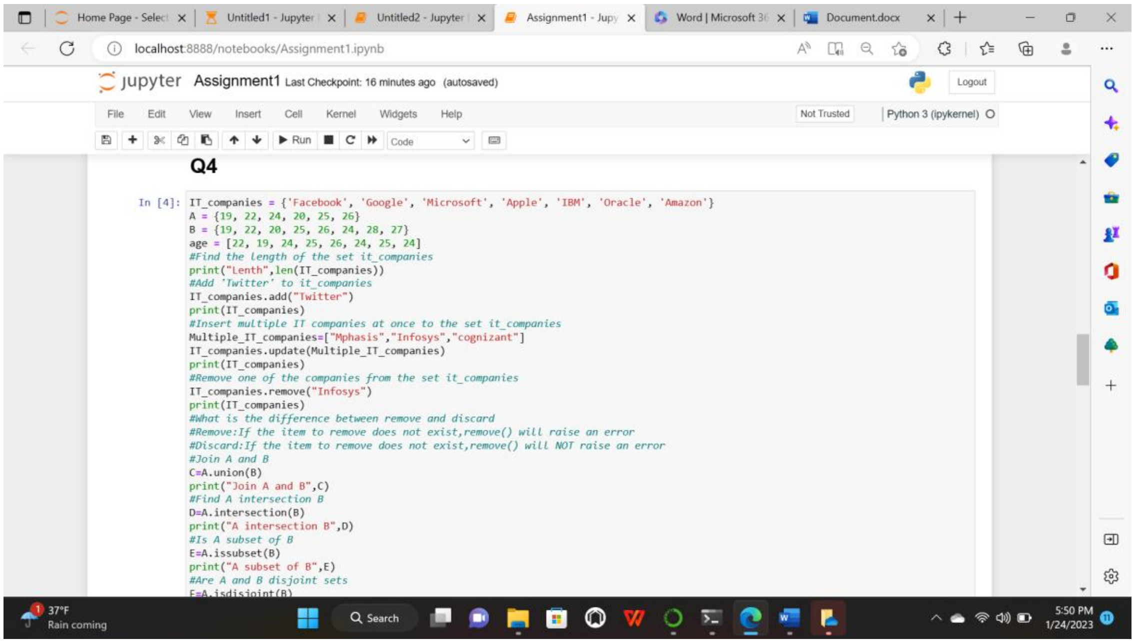
Q3

```
In [3]: #Create a tuple containing names of your sisters and your brothers
Sisters=("Mouni","Sireesha","Deepthi","Harshi")
Brothers=("Srikanth","Jagadesh","Sai","Vishnu","Kittu")
print("Sisters:",Sisters)
print("Brothers:",Brothers)
#Join brothers and sisters tuples and assign it to siblings
Siblings=Sisters+Brothers
print("Siblings:",Siblings)
#How many siblings do you have?
Count=len(Siblings)
print("Siblings count:",Count)
#Modify the siblings tuple and add the name of your father and mother and assign it to family_members
Mother="Indhira"
Father="Hariprasad"
family_members=list(Siblings)
family_members.append(Father)
family_members.append(Mother)
family_members=tuple(family_members)
print("family_members",family_members)
```

```
Sisters: ('Mouni', 'Sireesha', 'Deepthi', 'Harshi')
Brothers: ('Srikanth', 'Jagadesh', 'Sai', 'Vishnu', 'Kittu')
Siblings: ('Mouni', 'Sireesha', 'Deepthi', 'Harshi', 'Srikanth', 'Jagadesh', 'Sai', 'Vishnu', 'Kittu')
Siblings count: 9
family_members ('Mouni', 'Sireesha', 'Deepthi', 'Harshi', 'Srikanth', 'Jagadesh', 'Sai', 'Vishnu', 'Kittu', 'Hariprasad', 'Indh
ira')
```

Question 4

- Created sets named IT Companies, A, B, age and assigned values.
- Performed length and add operations on set IT Companies.
- Inserted and removed values to the set using update and remove method.
- Performed set operations like union, intersection, is subset, is disjoint, symmetric difference.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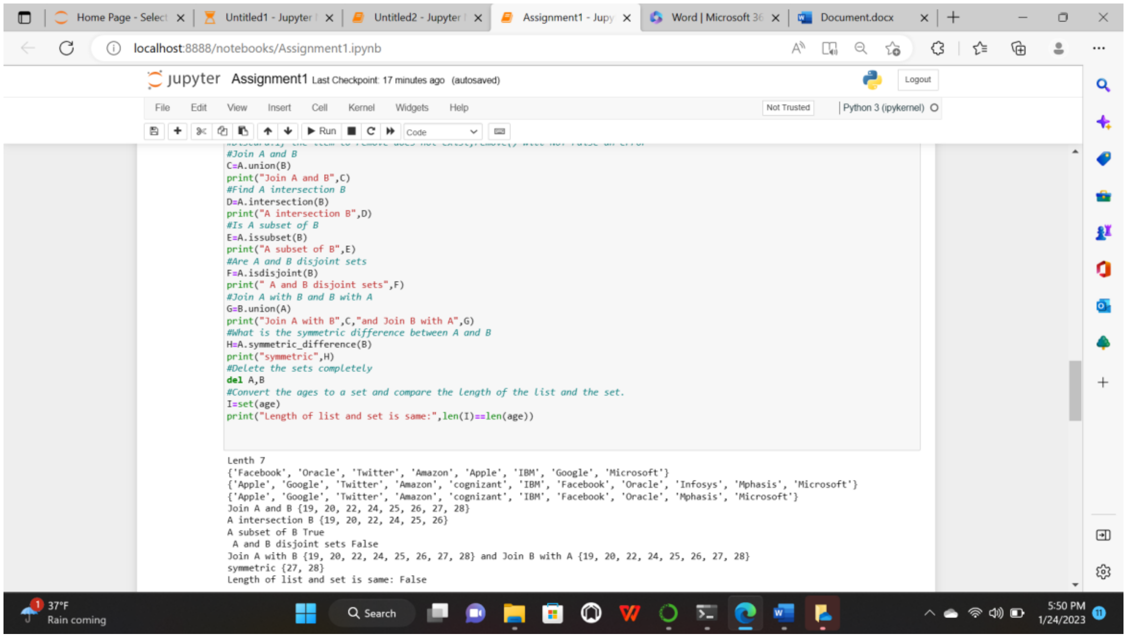
Python 3 (ipykernel)
Run
Code

Q4

```
In [4]: IT_companies = {'Facebook', 'Google', 'Microsoft', 'Apple', 'IBM', 'Oracle', 'Amazon'}
        A = {19, 22, 24, 20, 25, 26}
        B = {19, 22, 20, 25, 26, 24, 28, 27}
        age = [22, 19, 24, 25, 26, 24, 25, 24]
        #Find the length of the set it_companies
        print("Lenth",len(IT_companies))
        #Add 'Twitter' to it_companies
        IT_companies.add("Twitter")
        print(IT_companies)
        #Insert multiple IT companies at once to the set it_companies
        Multiple_IT_companies=["Mphasis","Infosys","cognizant"]
        IT_companies.update(Multiple_IT_companies)
        print(IT_companies)
        #Remove one of the companies from the set it_companies
        IT_companies.remove("Infosys")
        print(IT_companies)
        #What is the difference between remove and discard
        #Remove:If the item to remove does not exist,remove() will raise an error
        #Discard:If the item to remove does not exist,remove() will NOT raise an error
        #Join A and B
        C=A.union(B)
        print("Join A and B",C)
        #Find A intersection B
        D=A.intersection(B)
        print("A intersection B",D)
        #Is A subset of B
        E=A.issubset(B)
        print("A subset of B",E)
        #Are A and B disjoint sets
        F=A.isdisjoint(B)
```

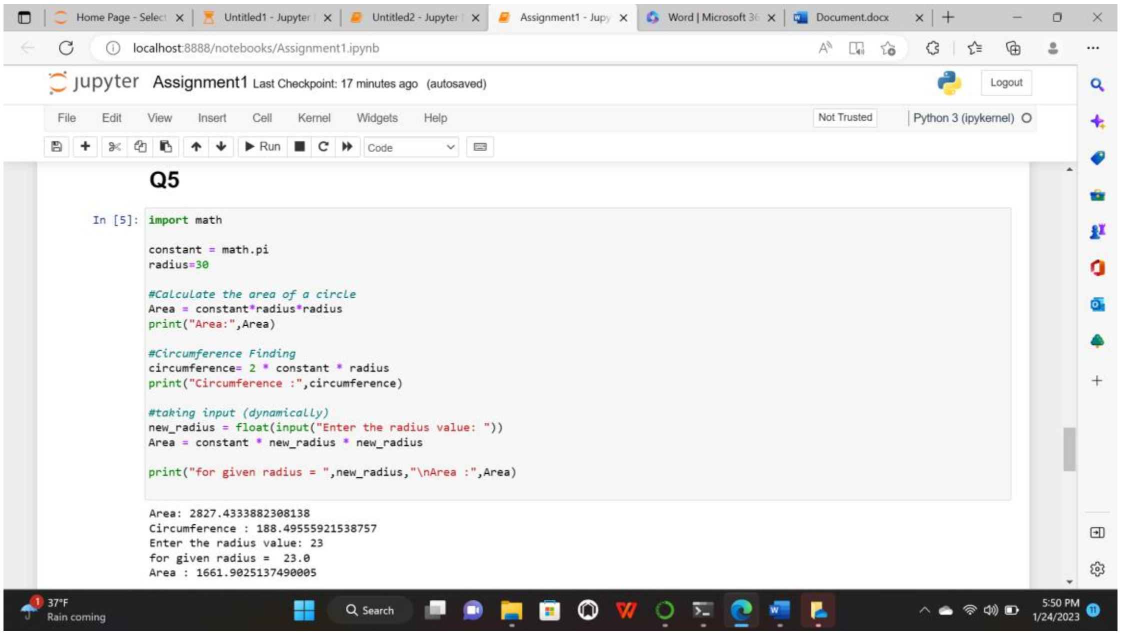

localhost:8888/notebooks/Assignment1.ipynb
jupyter Assignment1 Last Checkpoint: 17 minutes ago (autosaved)
Logout
File Edit View Insert Cell Kernel Widgets Help
Not Trusted
Python 3 (ipykernel)
Run
Code

```
#Join A and B
C=A.union(B)
print("Join A and B",C)
#Find A intersection B
D=A.intersection(B)
print("A intersection B",D)
#Is A subset of B
E=A.issubset(B)
print("A subset of B",E)
#Are A and B disjoint sets
F=A.isdisjoint(B)
print(" A and B disjoint sets",F)
#Join A with B and B with A
G=B.union(A)
print("Join A with B",C,"and Join B with A",G)
#What is the symmetric difference between A and B
H=A.symmetric_difference(B)
print("symmetric",H)
#Delete the sets completely
del A,B
#Convert the ages to a set and compare the length of the list and the set.
I=set(age)
print("Length of list and set is same:",len(I)==len(age))
```

```
Lenth 7
{'Facebook', 'Oracle', 'Twitter', 'Amazon', 'Apple', 'IBM', 'Google', 'Microsoft'}
{'Apple', 'Google', 'Twitter', 'Amazon', 'cognizant', 'IBM', 'Facebook', 'Oracle', 'Infosys', 'Mphasis', 'Microsoft'}
{'Apple', 'Google', 'Twitter', 'Amazon', 'cognizant', 'IBM', 'Facebook', 'Oracle', 'Mphasis', 'Microsoft'}
Join A and B {19, 20, 22, 24, 25, 26, 27, 28}
A intersection B {19, 20, 22, 24, 25, 26}
A subset of B True
 A and B disjoint sets False
Join A with B {19, 20, 22, 24, 25, 26, 27, 28} and Join B with A {19, 20, 22, 24, 25, 26, 27, 28}
symmetric {27, 28}
Length of list and set is same: False
```

Question 5

- Imported Math library
- Created variables named constant (pi=3.14 imported from math) and radius (value is 30)
- Calculated area and circumference of the circle using formulae with int and float type radius.



Q5

```
In [5]: import math

        constant = math.pi
        radius=30

        #Calculate the area of a circle
        Area = constant*radius*radius
        print("Area:",Area)

        #Circumference Finding
        circumference= 2 * constant * radius
        print("Circumference :",circumference)

        #taking input (dynamically)
        new_radius = float(input("Enter the radius value: "))
        Area = constant * new_radius * new_radius

        print("for given radius = ",new_radius,"\nArea :",Area)
```

```
Area: 2827.4333882308138
Circumference : 188.49555921538757
Enter the radius value: 23
for given radius =  23.0
Area : 1661.9025137490005
```

Question 6

- Created a string named sentence.
- Words of the string are separated using split method and using the set method unique words are found.

Question 7

- Used the tab escape sequence to get the required output.

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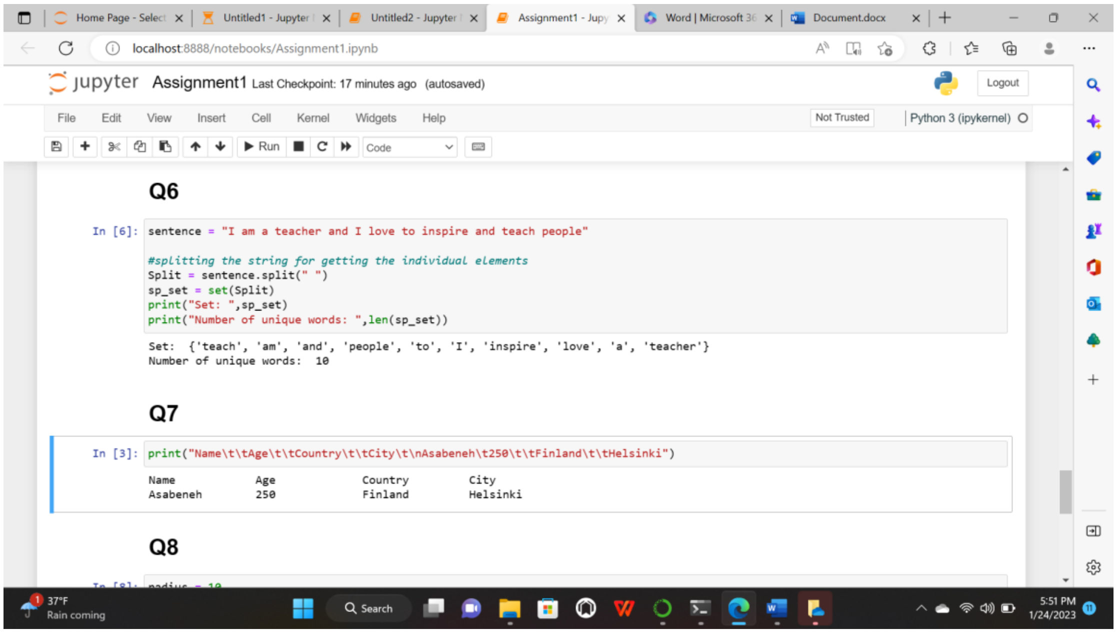


Q6

```
In [6]: sentence = "I am a teacher and I love to inspire and teach people"

        #splitting the string for getting the individual elements
        Split = sentence.split(" ")
        sp_set = set(Split)
        print("Set: ",sp_set)
        print("Number of unique words: ",len(sp_set))

        Set:  {'teach', 'am', 'and', 'people', 'to', 'I', 'inspire', 'love', 'a', 'teacher'}
        Number of unique words:  10
```

Q7

```
In [3]: print("Name\t\tAge\t\tCountry\t\tCity\t\nAsabeneh\t250\t\tFinland\t\tHelsinki")

        Name            Age             Country         City
        Asabeneh        250             Finland         Helsinki
```

Q8

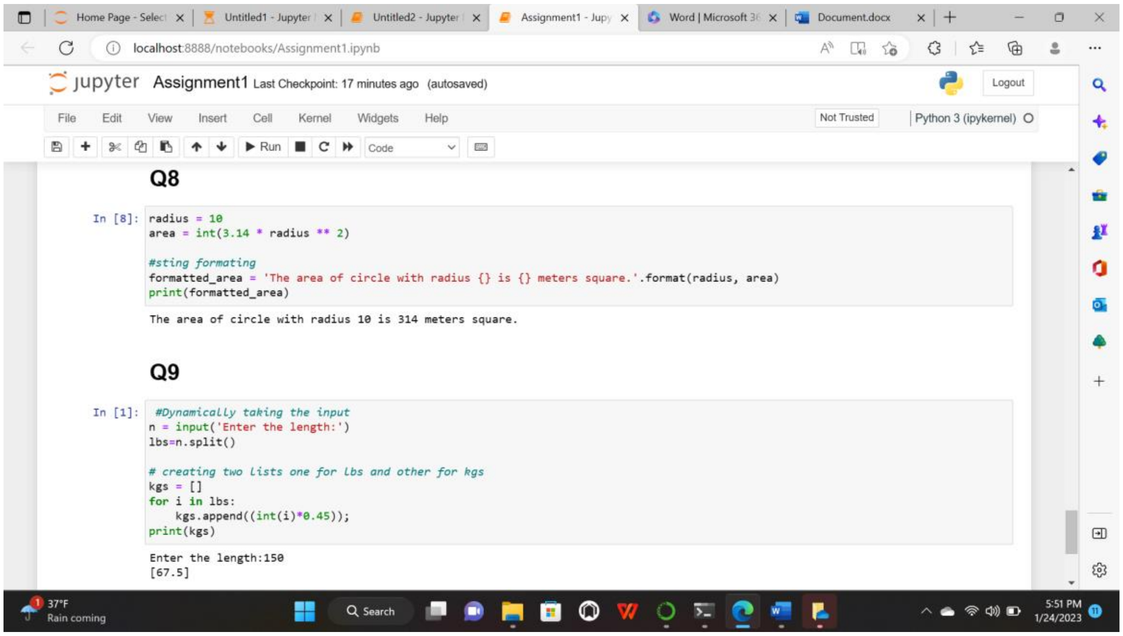
```
In [8]: radius = 10
```

Question 8

- Area of the circle is calculated and displayed the output string using the string format method.

Question 9

- Input values are given in the form of string, the values are separated using split method and converted to integer values.
- Given input values are in the form of lbs, those are converted to Kgs using the formula.



Q8

```
In [8]: radius = 10
        area = int(3.14 * radius ** 2)

        #sting formating
        formatted_area = 'The area of circle with radius {} is {} meters square.'.format(radius, area)
        print(formatted_area)

        The area of circle with radius 10 is 314 meters square.
```

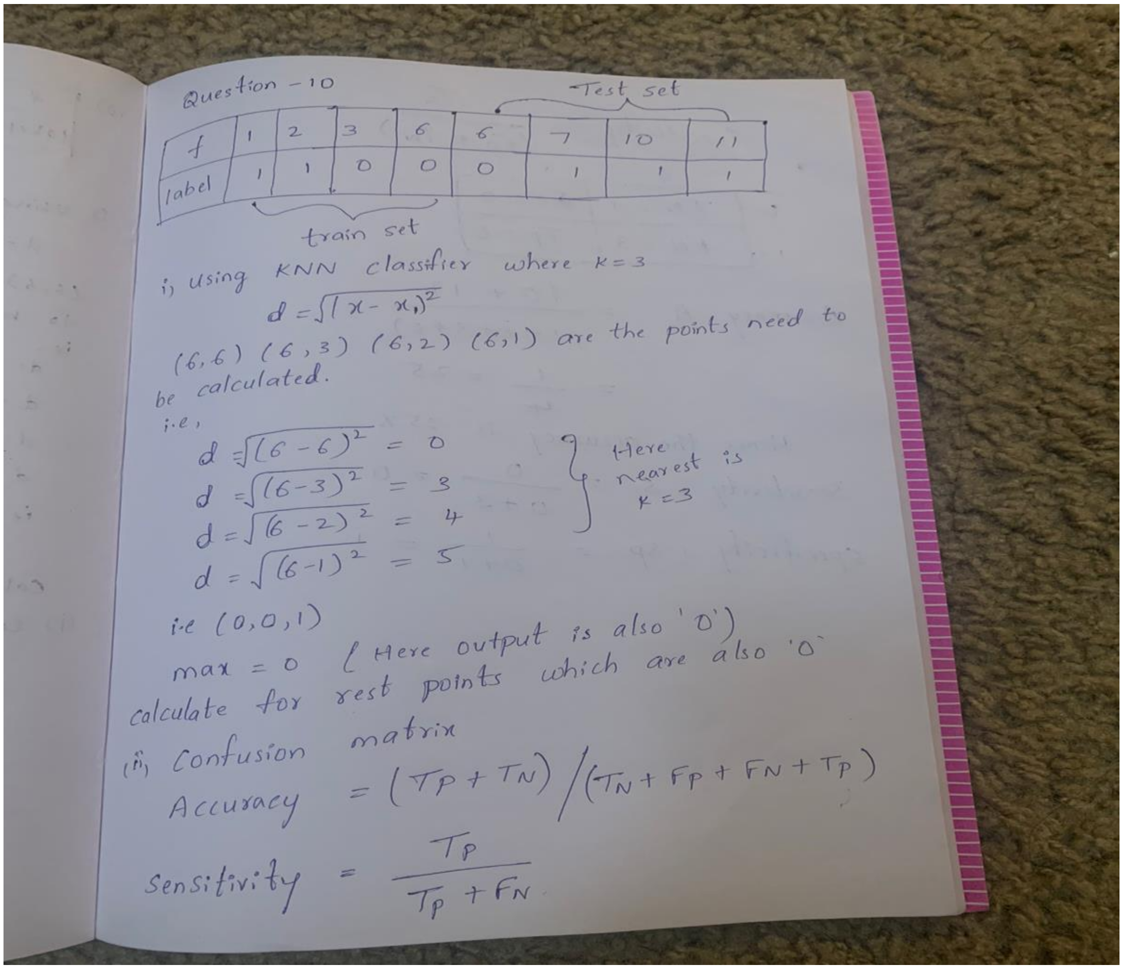
Q9

```
In [1]:  #Dynamically taking the input
        n = input('Enter the length:')
        lbs=n.split()

        # creating two lists one for lbs and other for kgs
        kgs = []
        for i in lbs:
            kgs.append((int(i)*0.45));
        print(kgs)

        Enter the length:150
        [67.5]
```

Question-10



Question -10

Test set

f	1	2	3	6	6	7	10	11
label	1	1	0	0	0	1	1	1

train set

i) using KNN classifier where $k=3$

$$d = \sqrt{(x - x_1)^2}$$

(6,6) (6,3) (6,2) (6,1) are the points need to be calculated.

i.e,

$$d = \sqrt{(6-6)^2} = 0$$
$$d = \sqrt{(6-3)^2} = 3$$
$$d = \sqrt{(6-2)^2} = 4$$
$$d = \sqrt{(6-1)^2} = 5$$

Here nearest is $k=3$

i.e (0,0,1)

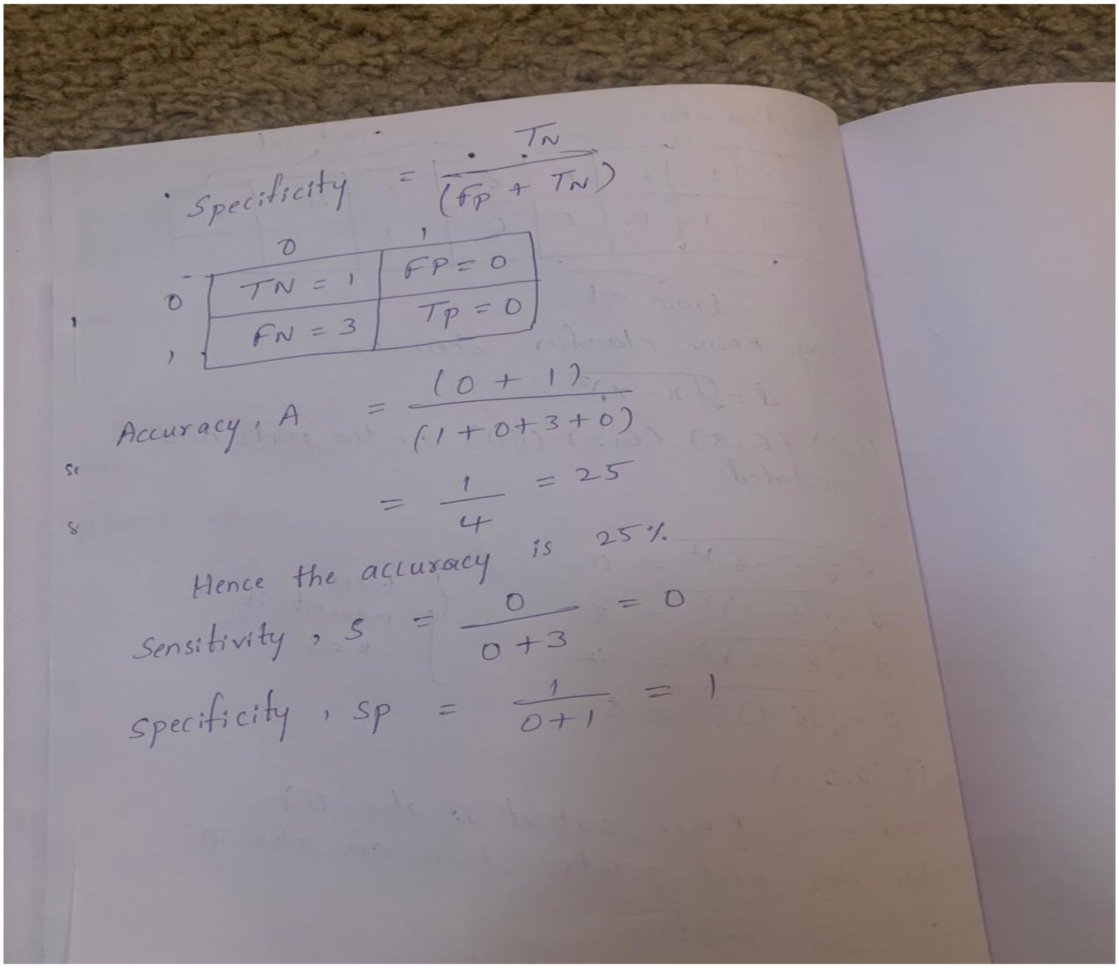
max = 0 (Here output is also '0')

calculate for rest points which are also '0'

(ii) Confusion matrix

Accuracy $= (T_P + T_N) / (T_N + F_P + F_N + T_P)$

$$\text{Sensitivity} = \frac{T_P}{T_P + F_N}$$



- Specificity $= \frac{TN}{(FP + TN)}$

	0	1
0	TN = 1	FP = 0
1	FN = 3	Tp = 0

$$\text{Accuracy, } A = \frac{(0 + 1)}{(1+0+3+0)}$$

$$= \frac{1}{4} = 25$$

Hence the accuracy is 25%.

$$\text{Sensitivity, } S = \frac{0}{0+3} = 0$$

$$\text{Specificity, } Sp = \frac{1}{0+1} = 1$$