GitHub: https://github.com/sandy100061/MachineLearningAssignment/tree/main/Assignment1

Video Link: https://drive.google.com/file/d/1Zj6D7z3mHXPrtvy_QCCHLJJMzoHHsyMf/view?usp=drive_link

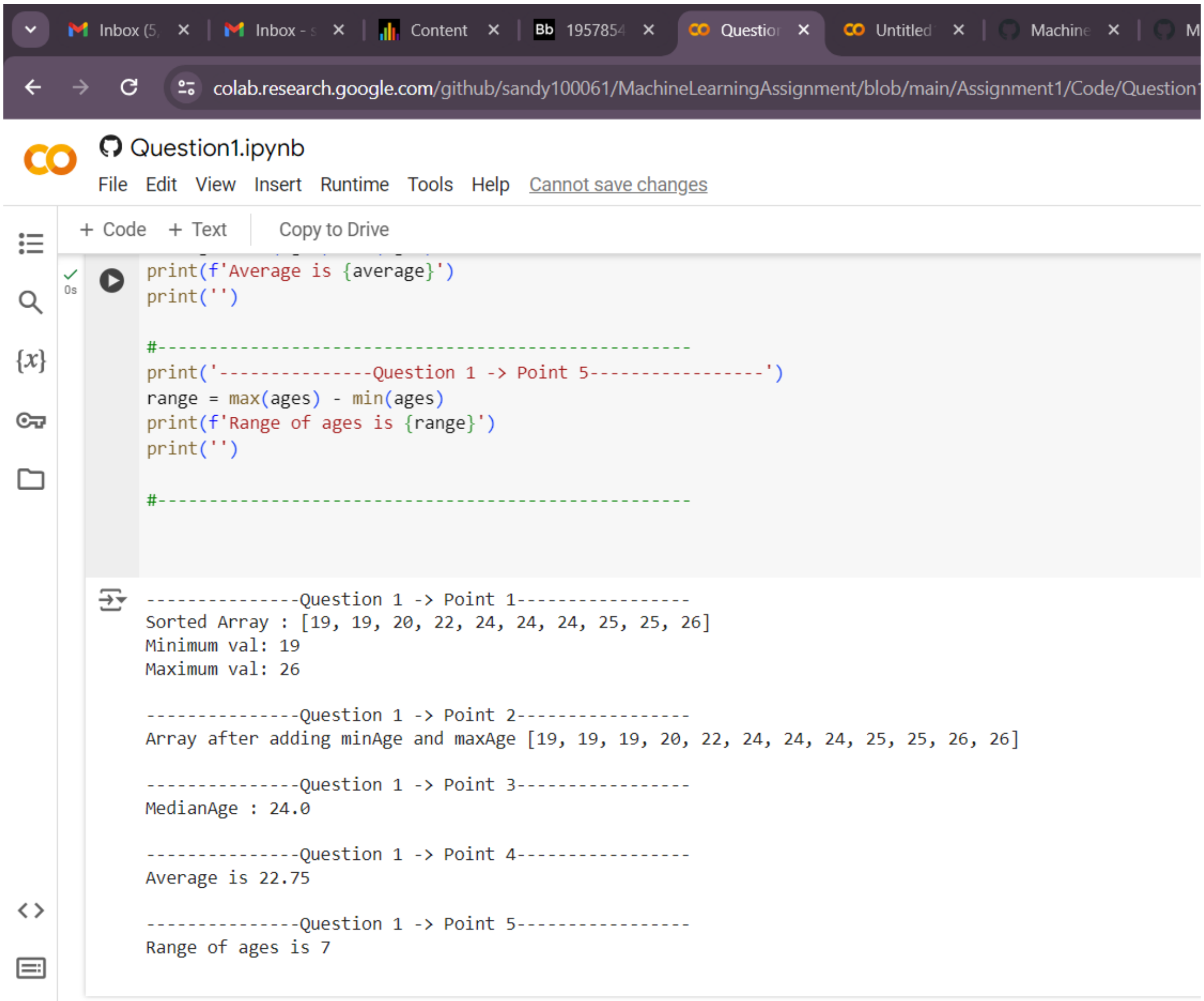
Question 1

The following is a list of 10 students' ages:

ages = [19, 22, 19, 24, 20, 25, 26, 24, 25, 24]

- Sort the list and find the min and max age
- Add the min age and the max-age again to the list
- Find the median age (one middle item or two middle items divided by two)
- Find the average age (sum of all items divided by their number)
- Find the range of the ages (max minus min)

```
# Sorting the list and find the min and max age
   ages = [19, 22, 19, 24, 20, 25, 26, 24, 25, 24]
   ages.sort()
   print(f'Sorted Array : {ages}')
   minAge = min(ages)
   maxAge = max(ages)

# min and max-age
print(f'Minimum val: {minAge}')
print(f'Maximum val: {maxAge}')


# Add the min age again to the list
  ages.append(minAge)
  print(ages)


# Add the max-age again to the list
  ages.append(maxAge)
  print(ages)

# Calculation of Median using statics library
   import statistics
   print(f'MedianAge : {statistics.median(ages)}')

# Calculation of Average value
   average= sum(ages)/len(ages)
   print(f'Average is {average}')
```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```
print(f'Average is {average}')
print('')

#----------------------------------------------------
print('--------------Question 1 -> Point 5----------------')
range = max(ages) - min(ages)
print(f'Range of ages is {range}')
print('')

#----------------------------------------------------
```

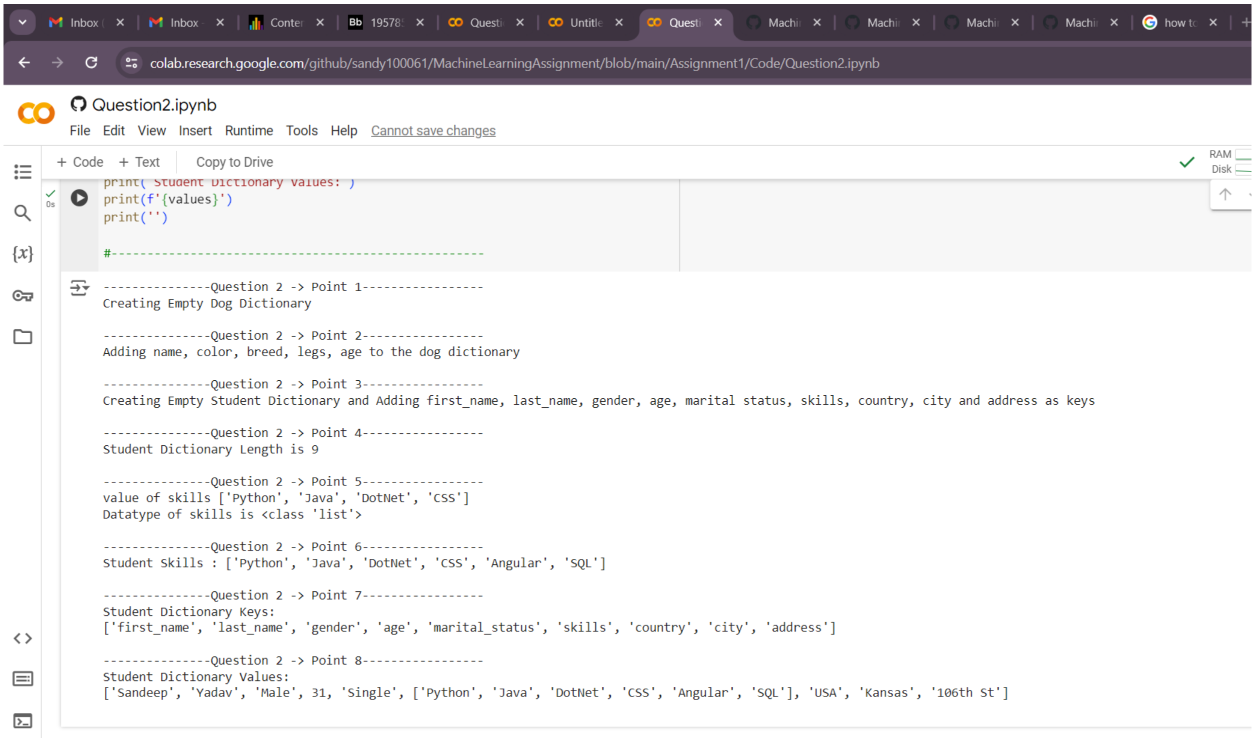
```
--------------Question 1 -> Point 1----------------
Sorted Array : [19, 19, 20, 22, 24, 24, 24, 25, 25, 26]
Minimum val: 19
Maximum val: 26

--------------Question 1 -> Point 2----------------
Array after adding minAge and maxAge [19, 19, 19, 20, 22, 24, 24, 24, 25, 25, 26, 26]

--------------Question 1 -> Point 3----------------
MedianAge : 24.0

--------------Question 1 -> Point 4----------------
Average is 22.75

--------------Question 1 -> Point 5----------------
Range of ages is 7
```

Question 2

- Create an empty dictionary called a dog.
- Add name, color, breed, legs, and age to the dog dictionary
- Create a student dictionary and add first_name, last_name, gender, age, marital status, skills, country, city, and address as keys for the dictionary
- Get the length of the student dictionary
- Get the value of skills and check the data type; it should be a list
- Modify the skills values by adding one or two skills
- Get the dictionary keys as a list
- Get the dictionary values as a list

```
# Create an empty dictionary called dog.
   dog = {}

# Add name, color, breed, legs, age to the dog dictionary
  print('Adding name, color, breed, legs, age to the dog dictionary')
 dog['name'] = 'Daisy'
 dog['color'] = 'Black'
 dog['breed'] = 'Labrador Retriever'
 dog['legs'] = 4
 dog['age'] = 14

# Create a student dictionary and add first_name, last_name, gender, age, marital
status, skills, country, city and address as keys for the dictionary
    print('Creating Empty Student Dictionary and Adding first_name, last_name, gender,
age, marital status, skills, country, city and address as keys')
student = {}

student['first_name'] = 'Sandeep'
student['last_name'] = 'Yadav'
student['gender'] = 'Male'
student['age'] = 31
student['marital_status'] = 'Single'
student['skills'] = ['Python', 'Java', 'DotNet', 'CSS']
student['country'] = 'USA'
student['city'] = 'Kansas'
student['address'] = '106th St'

# Get the length of the student dictionary
  studentLen = len(student)
  print(f'Student Dictionary Length is {studentLen}')
```

```
#Get the value of skills and check the data type, it should be a list
   skills = student['skills']
print(f'value of skills {skills}')
print(f'Datatype of skills is {type(skills)}')

# Modify the skills values by adding one or two skills
   skills.append('Angular')
skills.append('SQL')
print(f'Student Skills : {student["skills"]}')

#Get the dictionary keys as a list
   keys = list(student)
print('Student Dictionary Keys:')
print(f'{keys}')

# Get the dictionary values as a list
   values = list(student.values())
print('Student Dictionary Values:')
print(f'{values}')
```



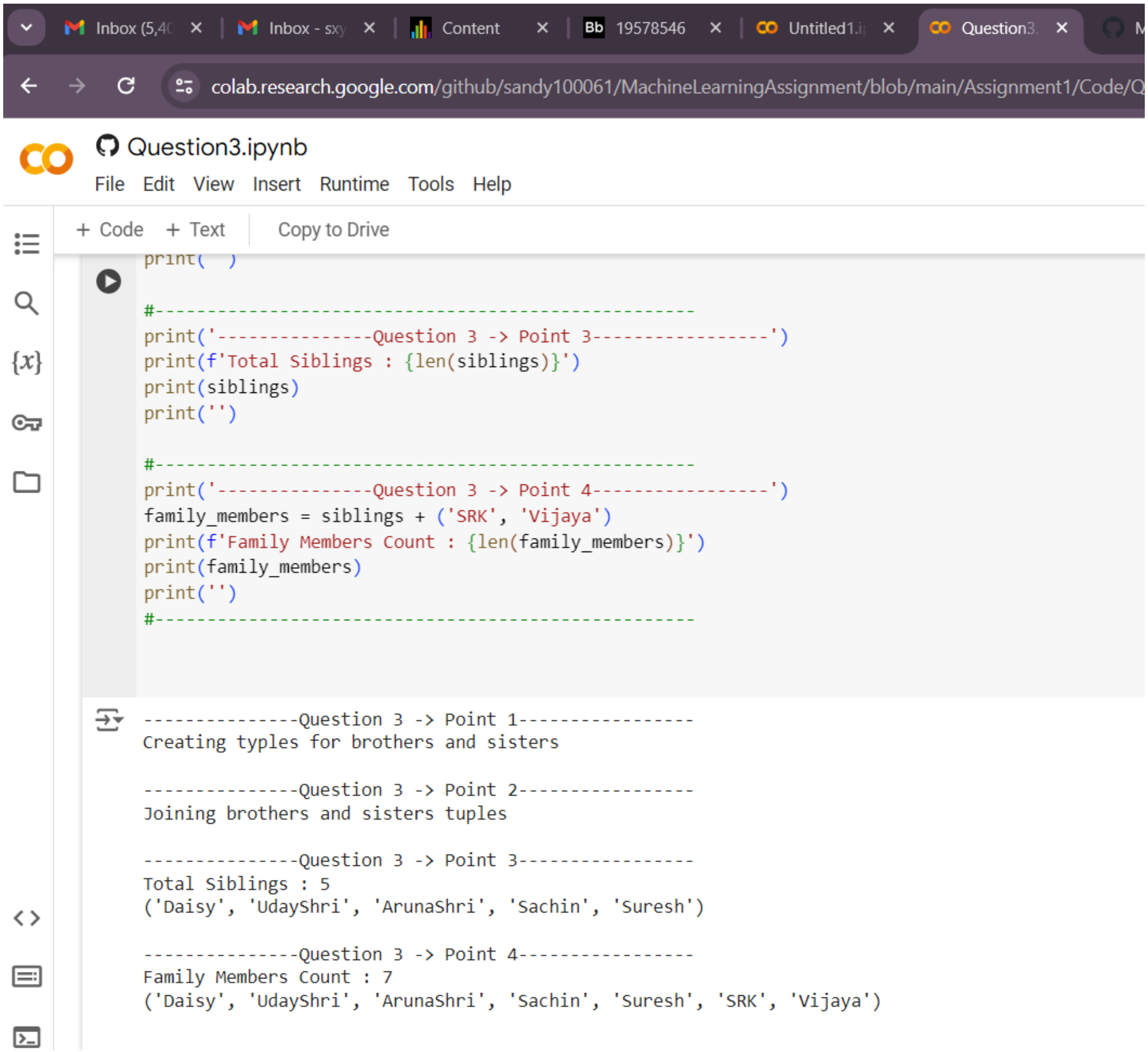
```
print('Student Dictionary Values:')
print(f'{values}')
print('')

#--------------------------------------------------
```

```
--------------Question 2 -> Point 1----------------
Creating Empty Dog Dictionary

--------------Question 2 -> Point 2----------------
Adding name, color, breed, legs, age to the dog dictionary

--------------Question 2 -> Point 3----------------
Creating Empty Student Dictionary and Adding first_name, last_name, gender, age, marital status, skills, country, city and address as keys

--------------Question 2 -> Point 4----------------
Student Dictionary Length is 9

--------------Question 2 -> Point 5----------------
value of skills ['Python', 'Java', 'DotNet', 'CSS']
Datatype of skills is <class 'list'>

--------------Question 2 -> Point 6----------------
Student Skills : ['Python', 'Java', 'DotNet', 'CSS', 'Angular', 'SQL']

--------------Question 2 -> Point 7----------------
Student Dictionary Keys:
['first_name', 'last_name', 'gender', 'age', 'marital_status', 'skills', 'country', 'city', 'address']

--------------Question 2 -> Point 8----------------
Student Dictionary Values:
['Sandeep', 'Yadav', 'Male', 31, 'Single', ['Python', 'Java', 'DotNet', 'CSS', 'Angular', 'SQL'], 'USA', 'Kansas', '106th St']
```

Question 3

- Create a tuple containing the names of your sisters and your brothers (imaginary siblings are fine)
- Join brothers and sisters’ tuples and assign it to siblings.
- How many siblings do you have?
- Modify the sibling’s tuple and add the name of your father and mother and assign it to family_members

```
#Create a tuple containing names of your sisters and your brothers (imaginary siblings
are fine)
  print('Creating typles for brothers and sisters')
sisters = ('Daisy', 'UdayShri', 'ArunaShri')
brothers = ('Sachin', 'Suresh')

# Join brothers and sisters tuples and assign it to siblings
  print('Joining brothers and sisters tuples')
siblings = sisters + brothers

# How many siblings do you have?
   print(f'Total Siblings : {len(siblings)}')
print(siblings)

# Family Members
     family_members = siblings + ('SRK', 'Vijaya')
print(f'Family Members Count : {len(family_members)}')
print(family_members)
```



```python
print('')

#---------------------------------------------------
print('--------------Question 3 -> Point 3----------------')
print(f'Total Siblings : {len(siblings)}')
print(siblings)
print('')

#---------------------------------------------------
print('--------------Question 3 -> Point 4----------------')
family_members = siblings + ('SRK', 'Vijaya')
print(f'Family Members Count : {len(family_members)}')
print(family_members)
print('')
#---------------------------------------------------
```

```
--------------Question 3 -> Point 1----------------
Creating typles for brothers and sisters

--------------Question 3 -> Point 2----------------
Joining brothers and sisters tuples

--------------Question 3 -> Point 3----------------
Total Siblings : 5
('Daisy', 'UdayShri', 'ArunaShri', 'Sachin', 'Suresh')

--------------Question 3 -> Point 4----------------
Family Members Count : 7
('Daisy', 'UdayShri', 'ArunaShri', 'Sachin', 'Suresh', 'SRK', 'Vijaya')
```

Question 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}

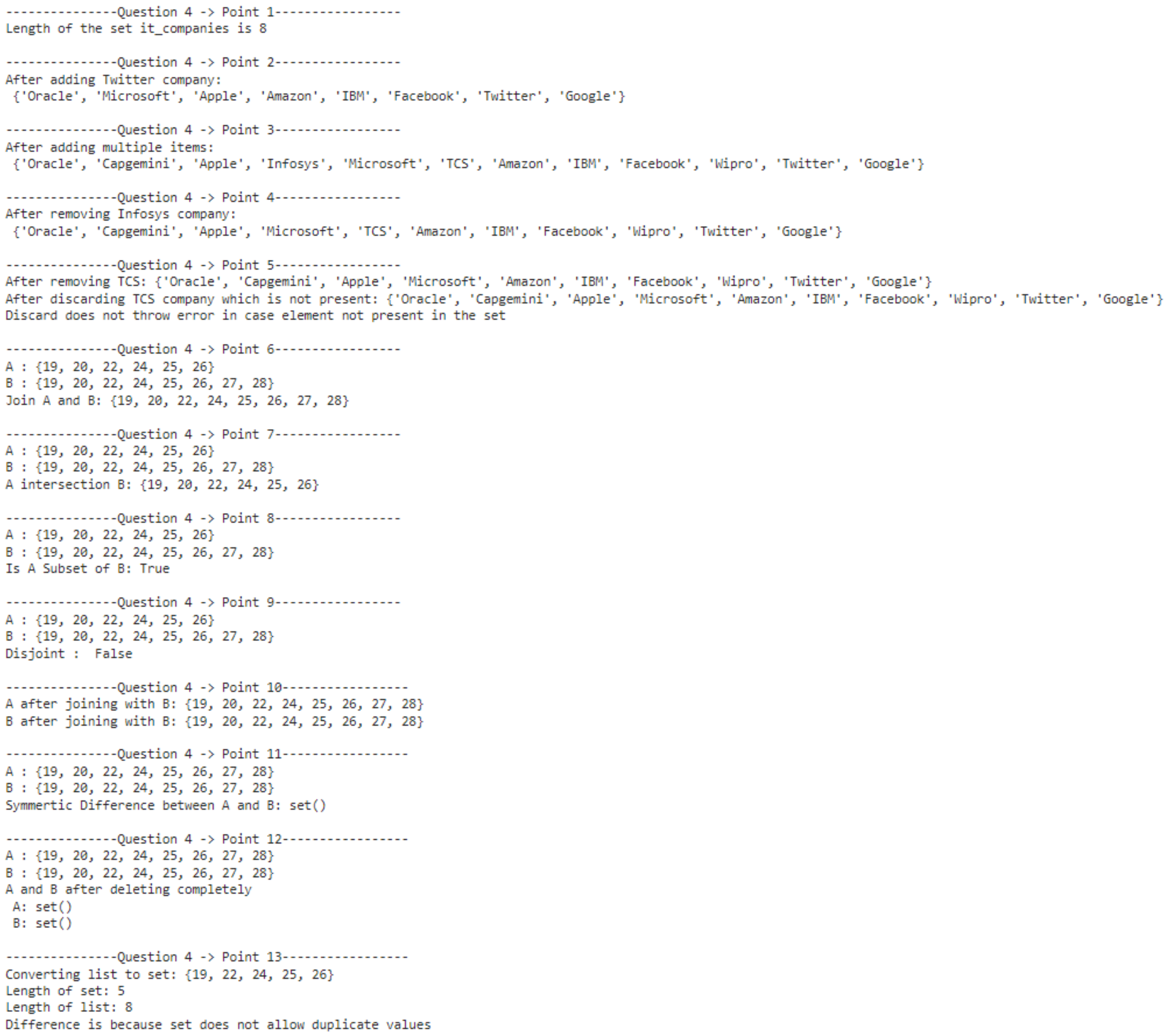
age = [22, 19, 24, 25, 26, 24, 25, 24]

- Find the length of the set it_companies
- Add 'Twitter' to it_companies
- Insert multiple IT companies at once to the set it_companies
- Remove one of the companies from the set it_companies
- What is the difference between remove and discard
- Join A and B
- Find A intersection B
- Is A subset of B
- Are A and B disjoint sets
- Join A with B and B with A
- What is the symmetric difference between A and B
- Delete the sets completely
- Convert the ages to a set and compare the length of the list and the set

```
#Find the length of the set it_companies
  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]
print(f'Length of the set it_companies is {len(age)}')

#Add 'Twitter' to it_companies
  it_companies.add('Twitter')
print("After adding Twitter company:\n", it_companies)

#Insert multiple IT companies at once to the set it_companies
  it_companies.update({'Infosys','Capgemini','Wipro','TCS'})
print("After adding multiple items:\n",it_companies)

#Remove one of the companies from the set it_companies
  it_companies.remove('Infosys')
print("After removing Infosys company:\n",it_companies)
```

```
#What is the difference between remove and discard
#Discard doesn't raise any error if any item is not present in the set
#Remove
it_companies.remove('TCS')
print("After removing TCS:",it_companies)
#Discard
it_companies.discard('TCS')
print("After discarding TCS company which is not present:",it_companies)
print("Discard does not throw error in case element not present in the set")

#Join A and B
  A = {19, 22, 24, 20, 25, 26}
print(f'A : {A}')
B = {19, 22, 20, 25, 26, 24, 28, 27}
print(f'B : {B}')
print("Join A and B:", A.union(B))

#Find A intersection B
  A = {19, 22, 24, 20, 25, 26}
print(f'A : {A}')
B = {19, 22, 20, 25, 26, 24, 28, 27}
print(f'B : {B}')
print("A intersection B:", A.intersection(B))


#Is A subset of B
  A = {19, 22, 24, 20, 25, 26}
print(f'A : {A}')
B = {19, 22, 20, 25, 26, 24, 28, 27}
print(f'B : {B}')
print("Is A Subset of B:", A.issubset(B))


#Join A with B and B with A

A = {19, 22, 24, 20, 25, 26}
B = {19, 22, 20, 25, 26, 24, 28, 27}
A = A.union(B)
B = B.union(B)
print(f'A after joining with B: {A}')
print(f'B after joining with B: {B}')

#Disjoint
  A = {19, 22, 24, 20, 25, 26}
print(f'A : {A}')
B = {19, 22, 20, 25, 26, 24, 28, 27}
```

```
print(f'B : {B}')
print("Disjoint : ", A.isdisjoint(B))


#What is the symmetric difference between A and B
  print(f'A : {A}')
print(f'B : {B}')
print(f'Symmertic Difference between A and B: {A.symmetric_difference(B)}')

#Delete the sets completely
  print(f'A : {A}')
print(f'B : {B}')
A.clear()
B.clear()
print(f'A and B after deleting completely\n A: {A} \n B: {B}')

#Convert the ages to a set and compare the length of the list and the set
  age = [22, 19, 24, 25, 26, 24, 25, 24]
print("Converting list to set:", set(age))
#Length of set(age)
print("Length of set:",len(set(age)))
#Length of list(age)
print("Length of list:",len(age))
print('Difference is because set does not allow duplicate values')
```



```
--------------Question 4 -> Point 1----------------
Length of the set it_companies is 8

--------------Question 4 -> Point 2----------------
After adding Twitter company:
 {'Oracle', 'Microsoft', 'Apple', 'Amazon', 'IBM', 'Facebook', 'Twitter', 'Google'}

--------------Question 4 -> Point 3----------------
After adding multiple items:
 {'Oracle', 'Capgemini', 'Apple', 'Infosys', 'Microsoft', 'TCS', 'Amazon', 'IBM', 'Facebook', 'Wipro', 'Twitter', 'Google'}

--------------Question 4 -> Point 4----------------
After removing Infosys company:
 {'Oracle', 'Capgemini', 'Apple', 'Microsoft', 'TCS', 'Amazon', 'IBM', 'Facebook', 'Wipro', 'Twitter', 'Google'}

--------------Question 4 -> Point 5----------------
After removing TCS: {'Oracle', 'Capgemini', 'Apple', 'Microsoft', 'Amazon', 'IBM', 'Facebook', 'Wipro', 'Twitter', 'Google'}
After discarding TCS company which is not present: {'Oracle', 'Capgemini', 'Apple', 'Microsoft', 'Amazon', 'IBM', 'Facebook', 'Wipro', 'Twitter', 'Google'}
Discard does not throw error in case element not present in the set

--------------Question 4 -> Point 6----------------
A : {19, 20, 22, 24, 25, 26}
B : {19, 20, 22, 24, 25, 26, 27, 28}
Join A and B: {19, 20, 22, 24, 25, 26, 27, 28}

--------------Question 4 -> Point 7----------------
A : {19, 20, 22, 24, 25, 26}
B : {19, 20, 22, 24, 25, 26, 27, 28}
A intersection B: {19, 20, 22, 24, 25, 26}

--------------Question 4 -> Point 8----------------
A : {19, 20, 22, 24, 25, 26}
B : {19, 20, 22, 24, 25, 26, 27, 28}
Is A Subset of B: True

--------------Question 4 -> Point 9----------------
A : {19, 20, 22, 24, 25, 26}
B : {19, 20, 22, 24, 25, 26, 27, 28}
Disjoint :  False

--------------Question 4 -> Point 10----------------
A after joining with B: {19, 20, 22, 24, 25, 26, 27, 28}
B after joining with B: {19, 20, 22, 24, 25, 26, 27, 28}

--------------Question 4 -> Point 11----------------
A : {19, 20, 22, 24, 25, 26, 27, 28}
B : {19, 20, 22, 24, 25, 26, 27, 28}
Symmertic Difference between A and B: set()

--------------Question 4 -> Point 12----------------
A : {19, 20, 22, 24, 25, 26, 27, 28}
B : {19, 20, 22, 24, 25, 26, 27, 28}
A and B after deleting completely
 A: set()
 B: set()

--------------Question 4 -> Point 13----------------
Converting list to set: {19, 22, 24, 25, 26}
Length of set: 5
Length of list: 8
Difference is because set does not allow duplicate values
```

Question 5

The radius of a circle is 30 meters.

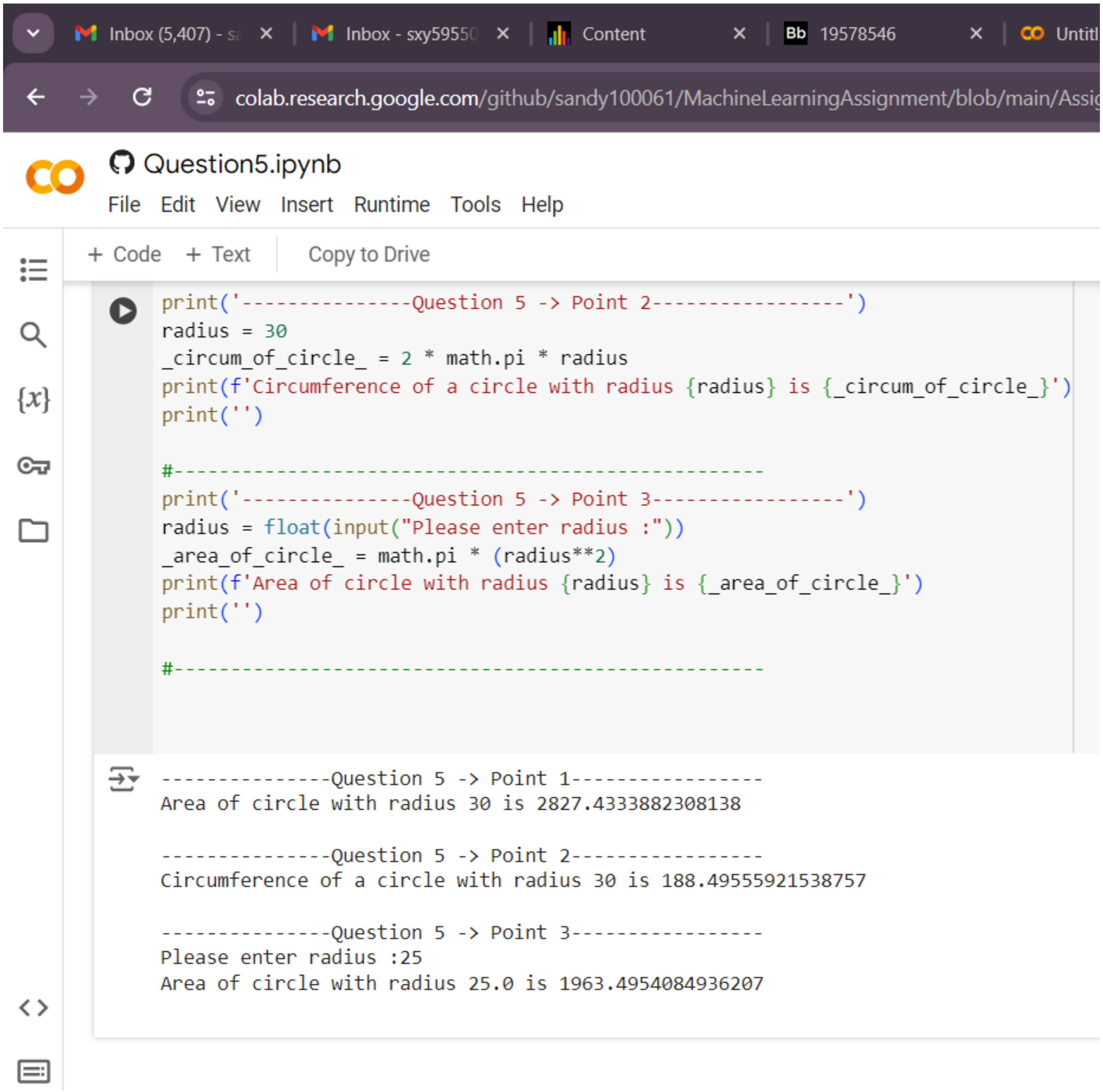
- Calculate the area of a circle and assign the value to a variable name of area_of_circle
- Calculate the circumference of a circle and assign the value to a variable name of circum_of_circle

- Take radius as user input and calculate the area.

```
#Calculate the area of a circle and assign the value to a variable name of area_of_circle
import mathr = 30
radius = 30
_area_of_circle_ = math.pi * (radius**2)
print(f'Area of circle with radius {radius} is {_area_of_circle_}')
```

```
#Calculate the circumference of a circle and assign the value to a variable name of
circum_of_circle
 radius = 30
_circum_of_circle_ = 2 * math.pi * radius
print(f'Circumference of a circle with radius {radius} is {_circum_of_circle_}')
```

```
#Take radius as user input and calculate the area.
radius = float(input("Please enter radius :"))
_area_of_circle_ = math.pi * (radius**2)
print(f'Area of circle with radius {radius} is {_area_of_circle_}')
```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```
print('--------------Question 5 -> Point 2----------------')
radius = 30
_circum_of_circle_ = 2 * math.pi * radius
print(f'Circumference of a circle with radius {radius} is {_circum_of_circle_}')
print('')

#----------------------------------------------------

print('--------------Question 5 -> Point 3----------------')
radius = float(input("Please enter radius :"))
_area_of_circle_ = math.pi * (radius**2)
print(f'Area of circle with radius {radius} is {_area_of_circle_}')
print('')

#----------------------------------------------------
```

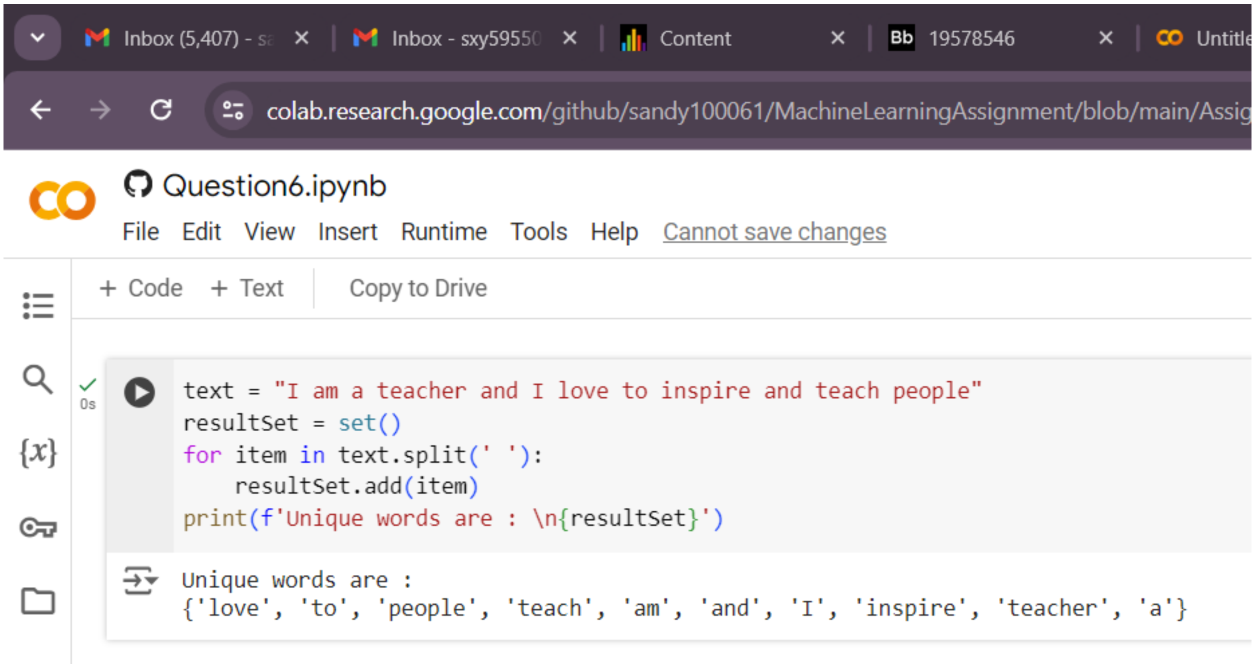
```
--------------Question 5 -> Point 1----------------
Area of circle with radius 30 is 2827.4333882308138

--------------Question 5 -> Point 2----------------
Circumference of a circle with radius 30 is 188.49555921538757

--------------Question 5 -> Point 3----------------
Please enter radius :25
Area of circle with radius 25.0 is 1963.4954084936207
```

Question 6

“I am a teacher and I love to inspire and teach people”

- How many unique words have been used in the sentence? Use the split methods and set to get the unique words.

```
#Unique word
text = "I am a teacher and I love to inspire and teach people"
resultSet = set()
for item in text.split(' '):
    resultSet.add(item)
print(f'Unique words are : \n{resultSet}')
```



```
text = "I am a teacher and I love to inspire and teach people"
resultSet = set()
for item in text.split(' '):
    resultSet.add(item)
print(f'Unique words are : \n{resultSet}')
```

```
Unique words are :
{'love', 'to', 'people', 'teach', 'am', 'and', 'I', 'inspire', 'teacher', 'a'}
```

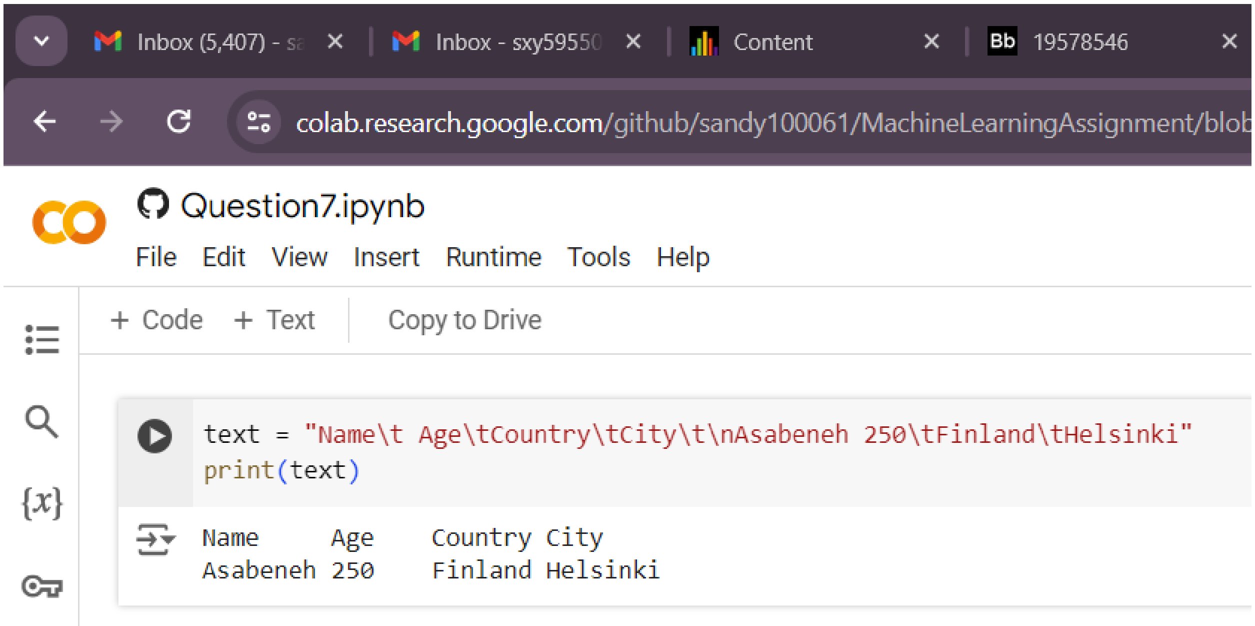
Question 7

Use a tab escape sequence to get the following lines.

Name   Age   Country   City

Asabeneh   250   Finland   Helsinki

text = "Name\t Age\tCountry\tCity\t\nAsabeneh 250\tFinland\tHelsinki"
print(text)



```
text = "Name\t Age\tCountry\tCity\t\nAsabeneh 250\tFinland\tHelsinki"
print(text)
```

```
Name     Age    Country City
Asabeneh 250    Finland Helsinki
```

Question 8

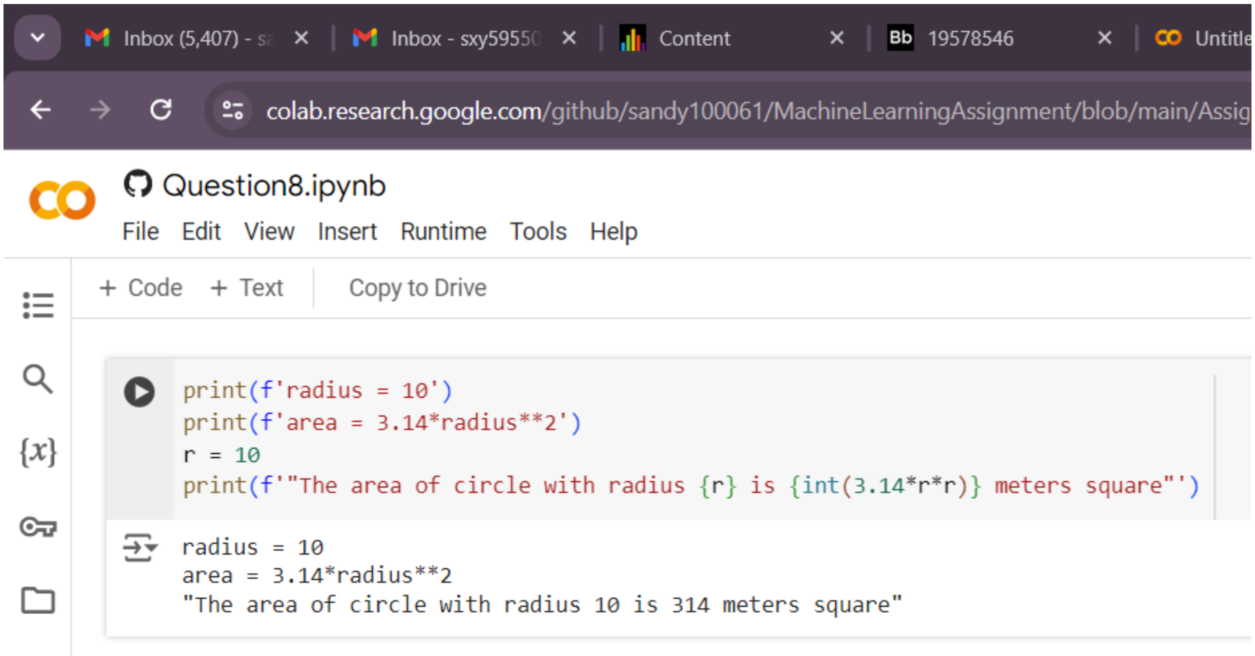
- Use the string formatting method to display the following:

  radius = 10

  area = 3.14 * radius ** 2

“The area of a circle with radius 10 is 314 meters square.”

```
print(f'radius = 10')
print(f'area = 3.14*radius**2')
r = 10
print(f'"The area of circle with radius {r} is {int(3.14*r*r)} meters square"')
```



```
print(f'radius = 10')
print(f'area = 3.14*radius**2')
r = 10
print(f'"The area of circle with radius {r} is {int(3.14*r*r)} meters square"')
```

```
radius = 10
area = 3.14*radius**2
"The area of circle with radius 10 is 314 meters square"
```

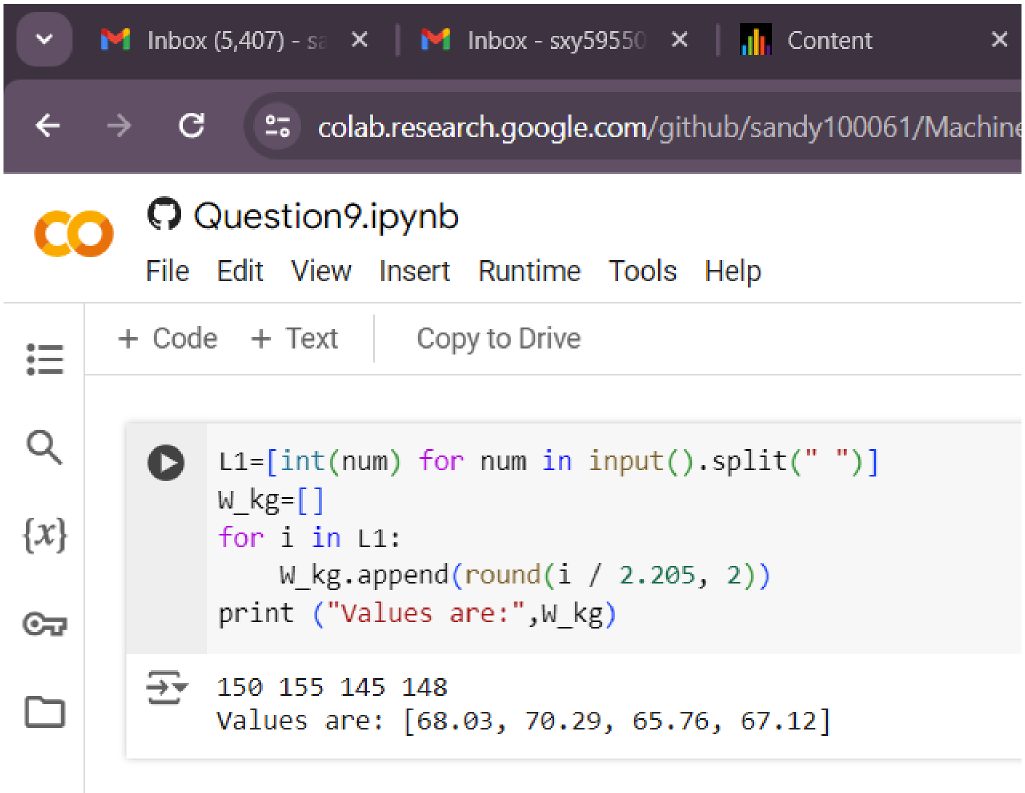
Question 9

- Write a program, which reads weights (lbs.) of N students into a list and convert these weights to kilograms in a separate list using Loop. N: No of students (Read input from user)

  Ex: L1: [150, 155, 145, 148]

  Output: [68.03, 70.3, 65.77, 67.13]

```
L1=[int(num) for num in input().split(" ")]
W_kg=[]
for i in L1:
   W_kg.append(round(i / 2.205, 2))
print ("Values are:",W_kg)
```



```
L1=[int(num) for num in input().split(" ")]
W_kg=[]
for i in L1:
    W_kg.append(round(i / 2.205, 2))
print ("Values are:",W_kg)
```

```
150 155 145 148
Values are: [68.03, 70.29, 65.76, 67.12]
```