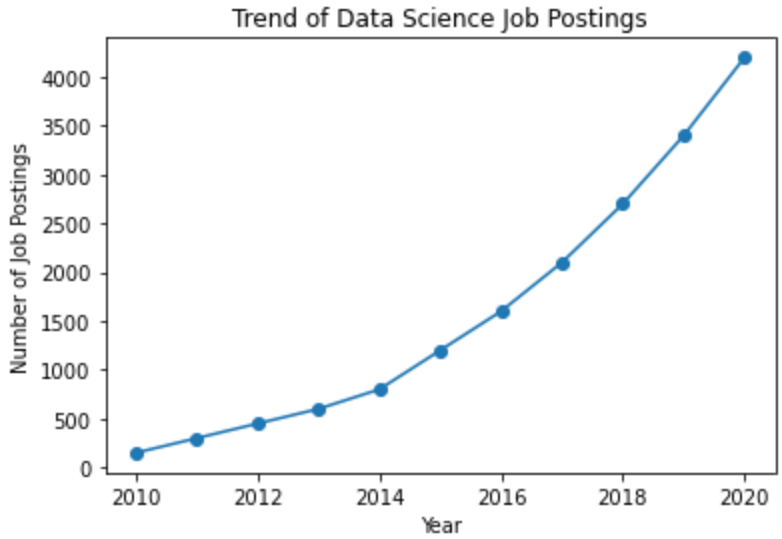
GURU PRASAD V 240701160 WEEK 04

1. The following table shows the number of Data Science job postings recorded over the years 2010
to 2020.
Year Job Postings
2010 150
2011 300
2012 450
2013 600
2014 800
2015 1200
2016 1600
2017 2100
2018 2700
2019 3400
2020 4200
Using Python (Pandas and Matplotlib):
1. Create a DataFrame for the given data.
2. Plot a line graph showing the trend of Data Science job postings over the years with markers
on data points.
3. Add suitable title and axis labels to the graph.
Expected Output: A line chart showing steady growth of job postings from 2010 to 2020.

In [13]:
```
import pandas as pd
import matplotlib.pyplot as plt
data = {'Year': list(range(2010, 2021)),
'Job Postings': [150, 300, 450, 600, 800, 1200, 1600, 2100, 2700, 3400, 4200]}
df = pd.DataFrame(data)
plt.plot(df['Year'], df['Job Postings'], marker='o')
plt.title('Trend of Data Science Job Postings')
plt.xlabel('Year')
plt.ylabel('Number of Job Postings')
plt.show()
```



2.Write a Python program using Matplotlib to create a bar chart that shows the distribution of
different Data Science roles (Data Analyst, Data Engineer, Data Scientist, ML Engineer, and
Business Analyst) with their respective counts. Add appropriate axis labels and a title to the
chart.

In [22]:
```
import matplotlib.pyplot as plt
roles = ['Data Analyst', 'Data Engineer', 'Data Scientist', 'ML Engineer', 'Bus
counts = [130, 90, 180, 80, 65]
plt.figure(figsize=(8, 6))
plt.bar(roles, counts, color='violet')
plt.xlabel('Data Science Role')
plt.ylabel('Number of Positions')
plt.title('Distribution of Data Science Roles')
plt.show()
```

3.Write a Python program to demonstrate the three main types of data: Structured,
Unstructured, and Semi-structured. Use a Pandas DataFrame for structured data, a text string
for unstructured data, and a dictionary for semi-structured data. Print each type of data with
clear labels.

In [23]:
```
import pandas as pd

structured = pd.DataFrame({
    'Name': ['Alice', 'Bob', 'Charlie'],
    'Age': [25, 30, 35]
})
unstructured = "Alice attended the Data Science conference in New York. She met
semi_structured = {
    'Name': 'Alice',
    'Skills': ['Python', 'Data Analysis', 'Machine Learning'],
    'Experience': {'Years': 5, 'Field': 'Data Science'}
}
print("Structured Data (DataFrame):")
print(structured)
print("\nUnstructured Data (Text):")
print(unstructured)
print("\nSemi-structured Data (Dictionary):")
print(semi_structured)
```

```
Structured Data (DataFrame):
      Name  Age
0    Alice   25
1      Bob   30
2  Charlie   35

Unstructured Data (Text):
Alice attended the Data Science conference in New York. She met Bob and Charl
ie there.

Semi-structured Data (Dictionary):
{'Name': 'Alice', 'Skills': ['Python', 'Data Analysis', 'Machine Learning'],
'Experience': {'Years': 5, 'Field': 'Data Science'}}
```

4.Write a Python program using the cryptography.fernet module to demonstrate symmetric
key encryption and decryption. Encrypt the text 'Rajalakshmi Engineering College' using a
generated key, display the encrypted ciphertext, and then decrypt it back to the original text.
Print the original, encrypted, and decrypted data.

In [24]:
```
from cryptography.fernet import Fernet
key = Fernet.generate_key()
f = Fernet(key)
token = f.encrypt(b"Rajalakshmi Engineering College")
token
f.decrypt(token)
key = Fernet.generate_key()
cipher_suite = Fernet(key)
plain_text = b"Rajalakshmi Engineering College."
cipher_text = cipher_suite.encrypt(plain_text)
decrypted_text = cipher_suite.decrypt(cipher_text)
print("Original Data:", plain_text)
print("Encrypted Data:", cipher_text)
print("Decrypted Data:", decrypted_text)
```

```
Original Data: b'Rajalakshmi Engineering College.'
Encrypted Data: b'gAAAAABorSy63_8swX0QPluPDy8ZGz--3WL6EVQ6HMiKMFV-UAuTkKb7cW4
AXbaMiBs4VERm0Wwdfn77wJDETlgRnKhTPCUJMtzOYw4ttHBqVmsuiQDYM0bSWK6BfD1PxebZQhfC
TCxY'
Decrypted Data: b'Rajalakshmi Engineering College.'
```