Using ‘supermarket_sales.csv’ file do the following operations and give required answer by using proper programming process.

1. Display the first 10 rows of the dataset.

2. Check for missing values and fill them using:
   Mean for numeric columns
   Mode for categorical columns

3. Find the total revenue generated by each branch .

4. Identify the top 5 most frequently sold product lines .

5. Calculate the average rating given by customers for each branch.

6. Determine the most preferred payment method (without using value_counts).

7. Find the total number of customers who made purchases using a membership.

8. Generate a cross-tabulation of customer type vs payment method using.

9. Compare the total sales made on weekends vs weekdays.

1. What is the output of the code shown below?

```
import re
text = "Will we earn RE?"
pattern = r'\w{4}\W+[^\W]'
result = re.sub(pattern, "$", text)
print(result)
```

2. What is the output of the code shown below?

```
import pandas as pd
import numpy as np
df=pd.DataFrame([[0,1.0,2.0,np.nan,5],[2.0,0,1.0,5.0,np.nan],[5.0,0,1.0,np.nan,5.0]])
df.dropna()
print(df.loc[1,3])
```

3. What is the output of the code shown below?

```
import re
text = "<p>Demo Text <b>blue</b> and <i>italy</i> text.</p>"
pattern = r'<[^>].>'
result = re.sub(pattern, "", text)
print(result)
```

4. What is the output of the code shown below?

```
import pandas as pd
import numpy as np
data = { 'A': [1, 2, 3, np.nan, 5],
   'B': [1, np.nan, np.nan, 4, 5],
   'C': [np.nan, 2, 3, 4, np.nan]}
df = pd.DataFrame(data)
mean_A = df['A'].mean()
df['A'].fillna(mean_A, inplace=True)
df.dropna(subset=['B'], inplace=True)
df['C'].fillna(1, inplace=True)
print(df.loc[1,'C'])
```

5. What is the output of the code shown below?

```
import pandas as pd
import numpy as np
data = {
   'A': [np.nan, np.nan, 3, np.nan, 5],
   'B': [1, np.nan, 3, np.nan, np.nan],
   'C': [np.nan, 2, 3, np.nan, 2]
}
df = pd.DataFrame(data)
df.dropna(thresh=2, inplace=True)
df['A'].fillna(0, inplace=True)
median_C = df['C'].median()
df['C'].fillna(median_C, inplace=True)
print(df.loc[2,'A'])
```

6. What is the output of the code shown below?

```
import pandas as pd
import numpy as np
data = {
   'A': [10, 20, np.nan, 40, 50],
   'B': [5, 15, 25, np.nan, 45],
   'C': [10, np.nan, 30, 40, 50]
}
df = pd.DataFrame(data)
mean_A = df['A'].mean()
df['A'].fillna(mean_A, inplace=True)
df.dropna(subset=['B', 'C'])
print(df.shape)
```

7. What is the output of the below code?

```
import re
text = "The quick brown fox jumps over the lazy dog."
result = re.findall(r'\w{4}\s', text)
print(len(result))
```