Project : - Personal Finance

Personal finance involves managing your money and financial assets. This includes creating a budget, setting financial goals, tracking expenses, and making informed decisions about investing and saving for the future.

To effectively manage personal finances, it's important to start by creating a budget that outlines income and expenses. This helps identify areas where spending can be reduced to save money. Setting financial goals, such as saving for a down payment on a house or paying off debt, is also important. Once goals are identified, a plan can be developed to achieve them.

Tracking expenses is crucial to personal finance management. By keeping track of spending, areas where overspending occurs can be identified and adjusted accordingly. Finally, investing and saving for the future are important components of personal finance. By making informed decisions about investments, individuals can grow their wealth over time.

In your Jupiter Notebook project, you can include further information about each of these topics, as well as tips and resources for managing personal finances effectively.

Importing the necessary libraries

In [52]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
%matplotlib inline
import seaborn as sns
import warnings
warnings.filterwarnings('ignore')
```

Lading the dataset

In [53]:
```
f_data = pd.read_csv('F:\\Project\\Banking ( expense)\\financial_year.csv')
```

Data Pre-processing

In [54]:
```
f_data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 699 entries, 0 to 698
Data columns (total 6 columns):
 #   Column              Non-Null Count  Dtype 
---  ------              --------------  ----- 
 0   Date                699 non-null    object
 1   Description         699 non-null    object
 2   Ref No./Cheque No.  641 non-null    object
 3   Debit               699 non-null    object
 4   Credit              699 non-null    object
 5   Balance             699 non-null    object
dtypes: object(6)
memory usage: 32.9+ KB
```

In [55]:
```
# viewing the first 5 rows
f_data.head()
```

Out[55]:

	Date	Description	Ref No./Cheque No.	Debit	Credit	Balance
0	1-Apr-22	TO TRANSFER-UPI/DR/209169616147/79061786/BA...	TRANSFER TO 5099755162093	666		4,910.23
1	2-Apr-22	TO TRANSFER-UPI/DR/209248567935/PhonePe/YES...	TRANSFER TO 4692647162092	668		4,242.23
2	2-Apr-22	by debit card-OTHPOS209205043796INNOVITI PO...	NaN	787		3,455.23
3	2-Apr-22	TO TRANSFER-UPI/DR/209209086723/MOHMED ALI/...	TRANSFER TO 5097986162095	15		3,440.23
4	2-Apr-22	TO TRANSFER-UPI/DR/209261379341/SNAPDEAL/SB...	TRANSFER TO 5097971162092	575		2,865.23

```
In [56]: # viewing the last 5 rows
         f_data.tail()
```

Out[56]:

	Date	Description	Ref No./Cheque No.	Debit	Credit	Balance
694	4-Apr-23	ATM WDL-ATM CASH 30941 DEV BHOOMI INST OF T...	NaN	4,000.00		1,344.28
695	4-Apr-23	TO TRANSFER-UPI/DR/309420668848/Somwati/PYT...	TRANSFER TO 5097638162093	140		1,204.28
696	4-Apr-23	TO TRANSFER-UPI/DR/309409943260/NARENDRA/YE...	TRANSFER TO 4898732162093	10		1,194.28
697	4-Apr-23	TO TRANSFER-UPI/DR/309420787686/GAURAV K/YE...	TRANSFER TO 4692475162096	15		1,179.28
698	5-Apr-23	TO TRANSFER-INSUFFICIENT BAL ATM DECLINE CH...	TRANSFER TO 3199937024984	23.6		1,155.68

```
In [57]: # Checking for the all the available columns in the data frame
         f_data.columns

Out[57]: Index(['Date', 'Description', 'Ref No./Cheque No.', 'Debit', 'Credit',
                'Balance'],
               dtype='object')
```

As you can see we have 6 columns in which some of them are no use, so let's remove those columns

Columns are

- Ref No./Cheque No.
- Credit
- Balance

```
In [58]: # Let's drop the unnecessary columns which has no use in our analysis
         df = f_data.drop(['Ref No./Cheque No.', 'Credit','Balance'], axis = 1)

In [59]: # Columns
         df.columns

Out[59]: Index(['Date', 'Description', 'Debit'], dtype='object')
```

Converting columns name to lower

```
In [60]: df.columns = map(str.lower, df.columns)
```

In [61]:
```
df.head(10)
```

Out[61]:

	date	description	debit
0	1-Apr-22	TO TRANSFER-UPI/DR/209169616147/79061786/BA...	666
1	2-Apr-22	TO TRANSFER-UPI/DR/209248567935/PhonePe/YES...	668
2	2-Apr-22	by debit card-OTHPOS209205043796INNOVITI PO...	787
3	2-Apr-22	TO TRANSFER-UPI/DR/209209086723/MOHMED ALI/...	15
4	2-Apr-22	TO TRANSFER-UPI/DR/209261379341/SNAPDEAL/SB...	575
5	2-Apr-22	BY TRANSFER-UPI/CR/209259989593/Razorpay/YE...	
6	3-Apr-22	BY TRANSFER-UPI/209019936720/REVERSAL--	
7	3-Apr-22	TO TRANSFER-UPI/DR/209380047589/KISHAN S/UC...	20
8	3-Apr-22	TO TRANSFER-UPI/DR/209323755090/Narendra/UT...	250
9	4-Apr-22	TO TRANSFER-UPI/DR/209432235162/Deepak P/PY...	30

There are some transaction which has no use in my analysis just because i get some transactions to get it withdrow isntantly.

So it's better get out of the data set.

In [62]:
```
# Create a Boolean mask for self transactions
self_mask = df['description'].str.contains(' BY TRANSFER|DEV BHOOMI INST OF TE
                                           case=False)
# Drop rows corresponding to self transactions
df = df.drop(df[self_mask].index)
```

Analysis Process

In [63]:
```
# create a new column with transaction category based on the description
df['Category'] = df['debit']  # default category for all transactions
df.loc[df['description'].str.contains('KISHAN S|Deepak P|SHRISHTI|ROHIT KA|ARU
df.loc[df['description'].str.contains('Dev Bhoo', case=False), 'GasExpense'] =
df.loc[df['description'].str.contains('AZEEM|haircut', case=False), 'GroomExpe
df.loc[df['description'].str.contains('Ram Baha|Guru Ji|GAURAV K', case=False)
df.loc[df['description'].str.contains('PhonePe', case=False), 'Bills_expense']

# convert the 'Date' column to datetime format
df['Date'] = pd.to_datetime(df['date'], format='%d-%b-%y')

# create a new column with the year and month extracted from the 'Date' column
df['Year_Month'] = df['Date'].dt.strftime('%Y-%m')
```

- We create a new column 'Category' with a default value of 'Other' for all transactions. We then use df.loc[] to assign transaction categories based on the presence of certain keywords in the 'Description' column.

- Next, we convert the 'Date' column to a datetime format using pd.to_datetime(). We then create a new column 'Year_Month' with the year and month extracted from the 'Date' column using the dt.strftime() method.
- The resulting DataFrame will have a new column 'Category' with transaction categories, and a new column 'Year_Month' with the year and month of each transaction.

In [64]:
```
# Although new columns is added into the data set so droping the existing unnec
df.drop('date', axis = 1)
```

Out[64]:

	description	debit	Category	FoodExpense	GasExpense	GroomE
0	TO TRANSFER-UPI/DR/209169616147/79061786/BA...	666	666	NaN	NaN	
1	TO TRANSFER-UPI/DR/209248567935/PhonePe/YES...	668	668	NaN	NaN	
2	by debit card-OTHPOS209205043796INNOVITI PO...	787	787	NaN	NaN	
3	TO TRANSFER-UPI/DR/209209086723/MOHMED ALI/...	15	15	NaN	NaN	
4	TO TRANSFER-UPI/DR/209261379341/SNAPDEAL/SB...	575	575	NaN	NaN	
...	...	...	...	...	...	
693	TO TRANSFER-UPI/DR/309420536186/GAURAV K/YE...	40	40	NaN	NaN	
695	TO TRANSFER-UPI/DR/309420668848/Somwati/PYT...	140	140	NaN	NaN	
696	TO TRANSFER-UPI/DR/309409943260/NARENDRA/YE...	10	10	NaN	NaN	
697	TO TRANSFER-UPI/DR/309420787686/GAURAV K/YE...	15	15	NaN	NaN	
698	TO TRANSFER-INSUFFICIENT BAL ATM DECLINE CH...	23.6	23.6	NaN	NaN	

588 rows × 10 columns

In [65]:
```
# drop rows with index 135 and 578
df = df.drop([135, 578])
```

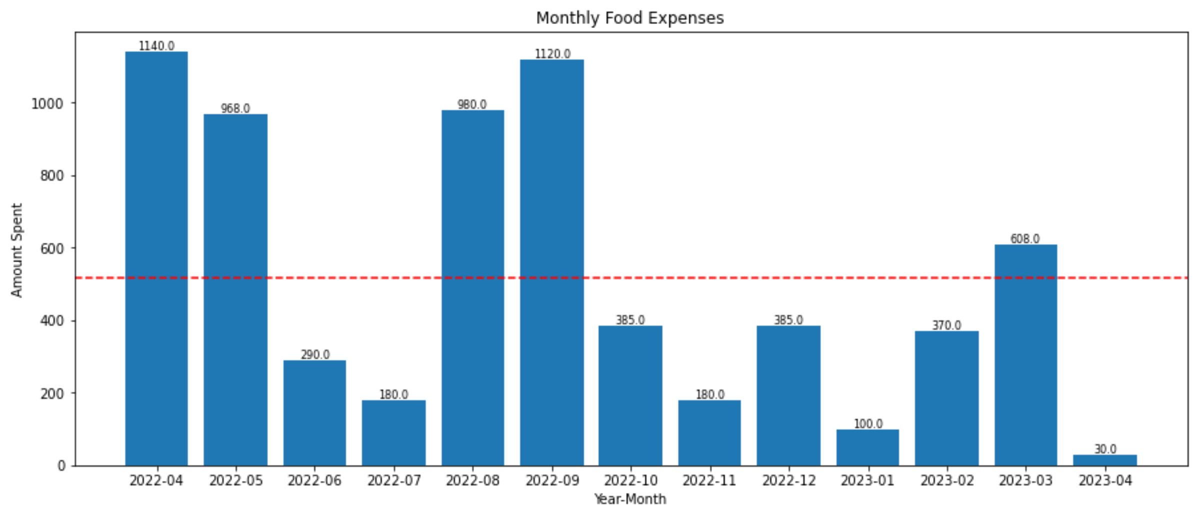
All the new columns

In [67]:
```
df.columns
```

Out[67]:
```
Index(['date', 'description', 'debit', 'Category', 'FoodExpense', 'GasExpens
e',
       'GroomExpense', 'Stat_expense', 'Bills_expense', 'Date', 'Year_Mont
h'],
      dtype='object')
```

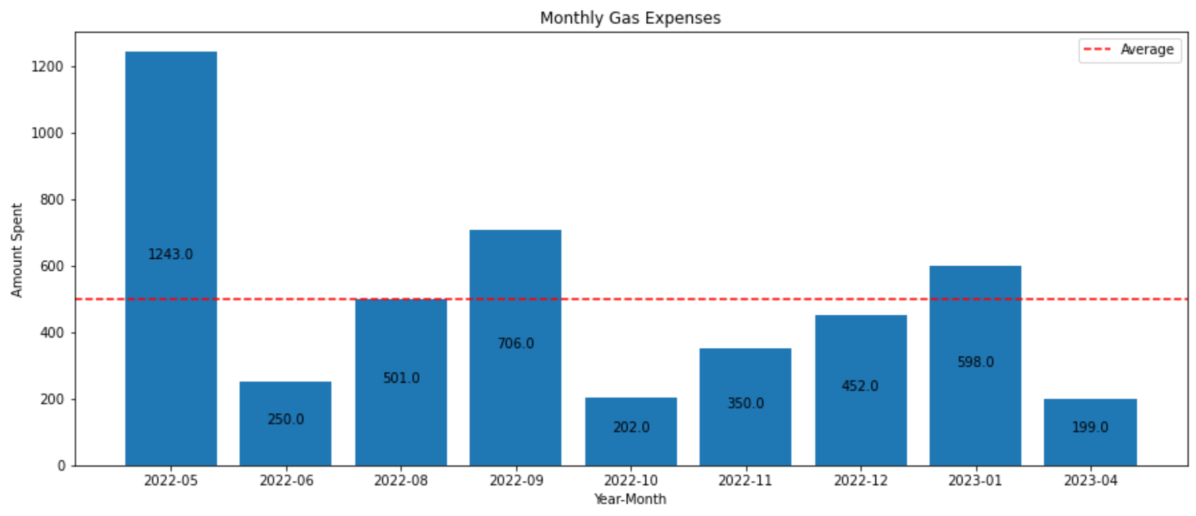
Monthly Food Expenses

In [68]:
```
# Geting  the sum of expenses for each month
df_food_sum = df_food.groupby('Year_Month')['FoodExpense'].sum().reset_index()

# Plot the bar chart
plt.figure(figsize=(15,6))
bars = plt.bar(df_food_sum['Year_Month'], df_food_sum['FoodExpense'])

# Adding the sum of expenses on top of the bars
for i, bar in enumerate(bars):
    plt.text(x=bar.get_x() + bar.get_width() / 2, y=bar.get_height() + 5,
             s=str(round(df_food_sum.loc[i, 'FoodExpense'], 2)), ha='center',

# Adding the average line
plt.axhline(df_food_sum['FoodExpense'].mean(), color='red', linestyle='--')

# Seting the title and axis labels
plt.title('Monthly Food Expenses')
plt.xlabel('Year-Month')
plt.ylabel('Amount Spent')

plt.show()
```



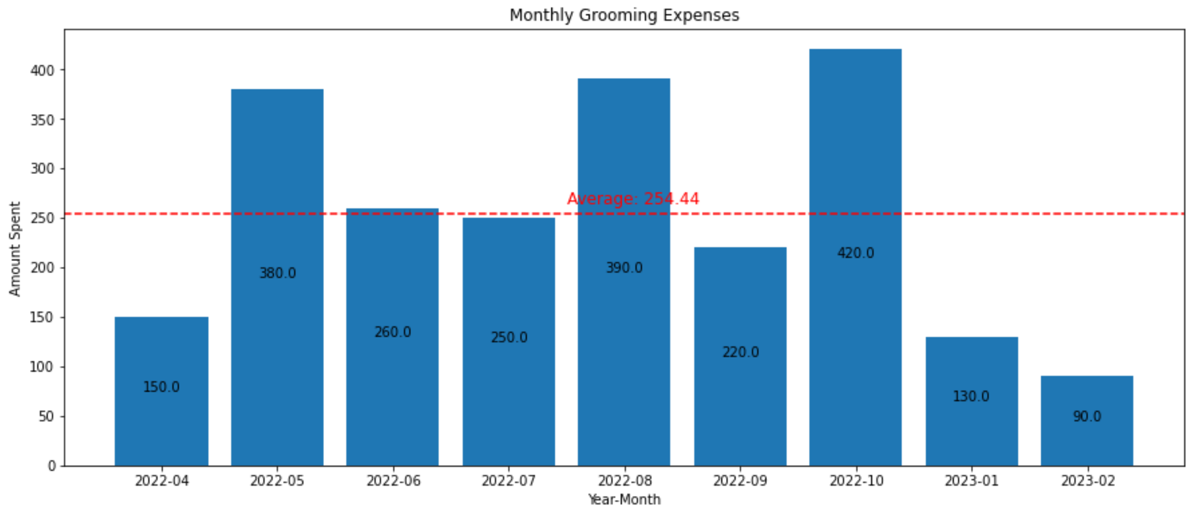
Monthly Gas/Fuel Expenses

In [69]:
```
df_Gas = df.loc[:, ['GasExpense', 'Year_Month']]
df_Gas = df_Gas.dropna()
df_Gas['GasExpense'] = df_Gas['GasExpense'].astype(float)

df_Gas_sum = df_Gas.groupby('Year_Month')['GasExpense'].sum().reset_index()

# calculating the average gas expense
avg_gas_expense = df_Gas_sum['GasExpense'].mean()

plt.figure(figsize=(15,6))
plt.bar(df_Gas_sum['Year_Month'], df_Gas_sum['GasExpense'])

# adddding text labels for the total sum of each month
for i, v in enumerate(df_Gas_sum['GasExpense']):
    plt.text(i, v/2, str(round(v, 2)), ha='center', fontsize=10)

# adding a horizontal line for the average gas expense
plt.axhline(avg_gas_expense, color='red', linestyle='--', label='Average')

plt.title('Monthly Gas Expenses')
plt.xlabel('Year-Month')
plt.ylabel('Amount Spent')
plt.legend()
plt.show()
```



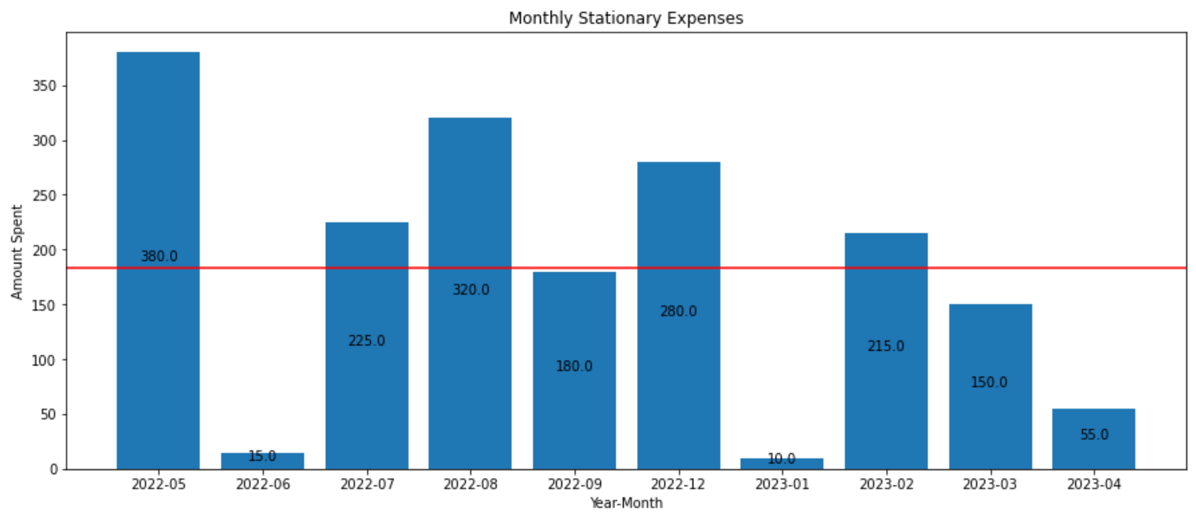
Monthly Salon Expenses

In [70]:
```
df_Hair = df.loc[:, ['GroomExpense', 'Year_Month']]
df_Hair = df_Hair.dropna()
df_Hair['GroomExpense'] = df_Hair['GroomExpense'].astype(float)

df_Hair_sum = df_Hair.groupby('Year_Month')['GroomExpense'].sum().reset_index(

plt.figure(figsize=(15,6))
plt.bar(df_Hair_sum['Year_Month'], df_Hair_sum['GroomExpense'])

# add text labels for the total sum of each month
for i, v in enumerate(df_Hair_sum['GroomExpense']):
    plt.text(i, v/2, str(round(v, 2)), ha='center', fontsize=10)

# add average line
avg = df_Hair_sum['GroomExpense'].mean()
plt.axhline(avg, color='red', linestyle='--')
plt.text(len(df_Hair_sum)/2-1, avg+10, f'Average: {round(avg, 2)}', color='red

plt.title('Monthly Grooming Expenses')
plt.xlabel('Year-Month')
plt.ylabel('Amount Spent')
plt.show()
```



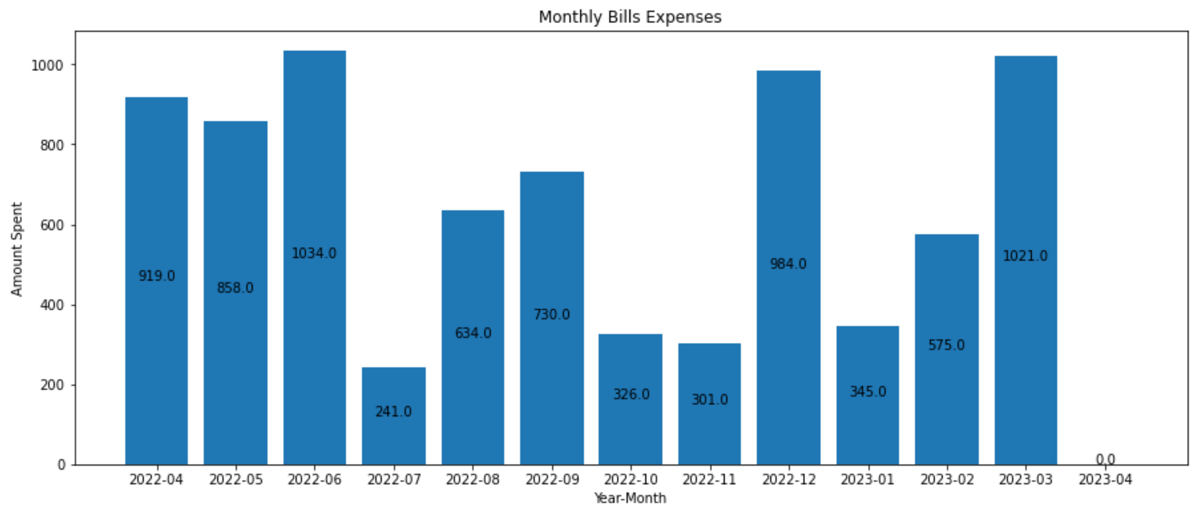
Monthly Stationary Expenses

In [71]:
```python
df_stationary = df.loc[:, ['Stat_expense', 'Year_Month']]
df_stationary = df_stationary.dropna()
df_stationary['Stat_expense'] = df_stationary['Stat_expense'].astype(float)

# grouping the DataFrame by 'Year_Month' and take the sum of 'Stat_expense' fo
df_stationary_sum = df_stationary.groupby('Year_Month')['Stat_expense'].sum().

# calculating the average expense for stationary items
avg_stationary_expense = df_stationary_sum['Stat_expense'].mean()

plt.figure(figsize=(15,6))
plt.bar(df_stationary_sum['Year_Month'], df_stationary_sum['Stat_expense'])

# adding a horizontal line for the average expense
plt.axhline(y=avg_stationary_expense, color='r', linestyle='-')

# adding text labels for the total sum of each month
for i, v in enumerate(df_stationary_sum['Stat_expense']):
    plt.text(i, v/2, str(round(v, 2)), ha='center', fontsize=10)

plt.title('Monthly Stationary Expenses')
plt.xlabel('Year-Month')
plt.ylabel('Amount Spent')
plt.show()
```



Monthly Bills Expenses

In [72]:
```
df_Bills = df.loc[:, ['Bills_expense', 'Year_Month']]
df_Bills.dropna()
df_Bills['Bills_expense'] = df_Bills['Bills_expense'].astype(float)

# group the DataFrame by 'Year_Month' and take the sum of 'Bills_expense' for e
df_Bills_sum = df_Bills.groupby('Year_Month')['Bills_expense'].sum().reset_ind

plt.figure(figsize=(15,6))
plt.bar(df_Bills_sum['Year_Month'], df_Bills_sum['Bills_expense'])

# add text labels for the total sum of each month
for i, v in enumerate(df_Bills_sum['Bills_expense']):
    plt.text(i, v/2, str(round(v, 2)), ha='center', fontsize=10)

plt.title('Monthly Bills Expenses')
plt.xlabel('Year-Month')
plt.ylabel('Amount Spent')
plt.show()
```



This is the completion of this project

Author

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| Date (YYYY-MM-DD) |
| 2023-04-06 |