Finance Analysis

December 19, 2023

[8]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

[39]:
```
data=pd.read_csv("Finance_data.csv")
```

[26]:
```
data.head()
```

[26]:

	gender	age	Investment_Avenues	Mutual_Funds	Equity_Market	Debentures	\
0	Female	34	Yes	1	2	5	
1	Female	23	Yes	4	3	2	
2	Male	30	Yes	3	6	4	
3	Male	22	Yes	2	1	3	
4	Female	24	No	2	1	3	

	Government_Bonds	Fixed_Deposits	PPF	Gold	…	Duration	\
0	3	7	6	4	…	1-3 years	
1	1	5	6	7	…	More than 5 years	
2	2	5	1	7	…	3-5 years	
3	7	6	4	5	…	Less than 1 year	
4	6	4	5	7	…	Less than 1 year	

	Invest_Monitor	Expect	Avenue	What are your savings objectives?	\
0	Monthly	20%-30%	Mutual Fund	Retirement Plan	
1	Weekly	20%-30%	Mutual Fund	Health Care	
2	Daily	20%-30%	Equity	Retirement Plan	
3	Daily	10%-20%	Equity	Retirement Plan	
4	Daily	20%-30%	Equity	Retirement Plan	

	Reason_Equity	Reason_Mutual	Reason_Bonds	\
0	Capital Appreciation	Better Returns	Safe Investment	
1	Dividend	Better Returns	Safe Investment	
2	Capital Appreciation	Tax Benefits	Assured Returns	
3	Dividend	Fund Diversification	Tax Incentives	
4	Capital Appreciation	Better Returns	Safe Investment	

	Reason_FD	Source

```
0        Fixed Returns  Newspapers and Magazines
1  High Interest Rates     Financial Consultants
2        Fixed Returns                Television
3  High Interest Rates                  Internet
4            Risk Free                  Internet

[5 rows x 24 columns]
```

[27]:
```
data.tail()
```

[27]:
```
   gender  age Investment_Avenues  Mutual_Funds  Equity_Market  Debentures  \
35   Male   30                Yes             1              4           6
36   Male   30                Yes             2              4           7
37   Male   25                Yes             5              4           7
38   Male   31                Yes             2              4           7
39   Male   29                Yes             4              3           5

    Government_Bonds  Fixed_Deposits  PPF  Gold  …   Duration  \
35                 5               3    2     7  …  3-5 years
36                 5               1    3     6  …  1-3 years
37                 6               1    2     3  …  3-5 years
38                 5               3    1     6  …  1-3 years
39                 7               2    1     6  …  3-5 years

   Invest_Monitor   Expect                 Avenue  \
35        Monthly  20%-30%         Fixed Deposits
36        Monthly  20%-30%                 Equity
37        Monthly  30%-40%  Public Provident Fund
38         Weekly  20%-30%                 Equity
39        Monthly  20%-30%         Fixed Deposits

   What are your savings objectives?         Reason_Equity  \
35                       Health Care  Capital Appreciation
36                   Retirement Plan  Capital Appreciation
37                       Health Care  Capital Appreciation
38                       Health Care              Dividend
39                   Retirement Plan              Dividend

           Reason_Mutual     Reason_Bonds      Reason_FD  \
35        Better Returns  Assured Returns  Fixed Returns
36        Better Returns  Assured Returns      Risk Free
37        Better Returns  Safe Investment  Fixed Returns
38  Fund Diversification  Assured Returns  Fixed Returns
39        Better Returns  Safe Investment  Fixed Returns

                     Source
35     Financial Consultants
```

```
36  Newspapers and Magazines
37     Financial Consultants
38  Newspapers and Magazines
39     Financial Consultants

[5 rows x 24 columns]
```

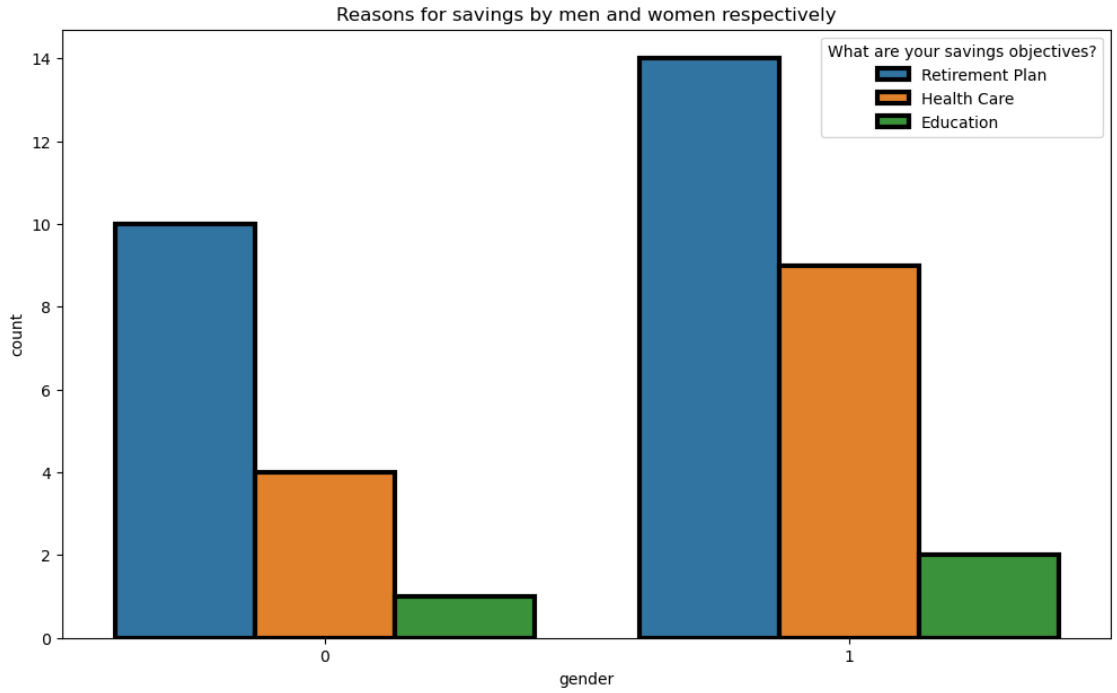
[28]:
```
data.keys()
```

[28]:
```
Index(['gender', 'age', 'Investment_Avenues', 'Mutual_Funds', 'Equity_Market',
       'Debentures', 'Government_Bonds', 'Fixed_Deposits', 'PPF', 'Gold',
       'Stock_Marktet', 'Factor', 'Objective', 'Purpose', 'Duration',
       'Invest_Monitor', 'Expect', 'Avenue',
       'What are your savings objectives?', 'Reason_Equity', 'Reason_Mutual',
       'Reason_Bonds', 'Reason_FD', 'Source'],
      dtype='object')
```

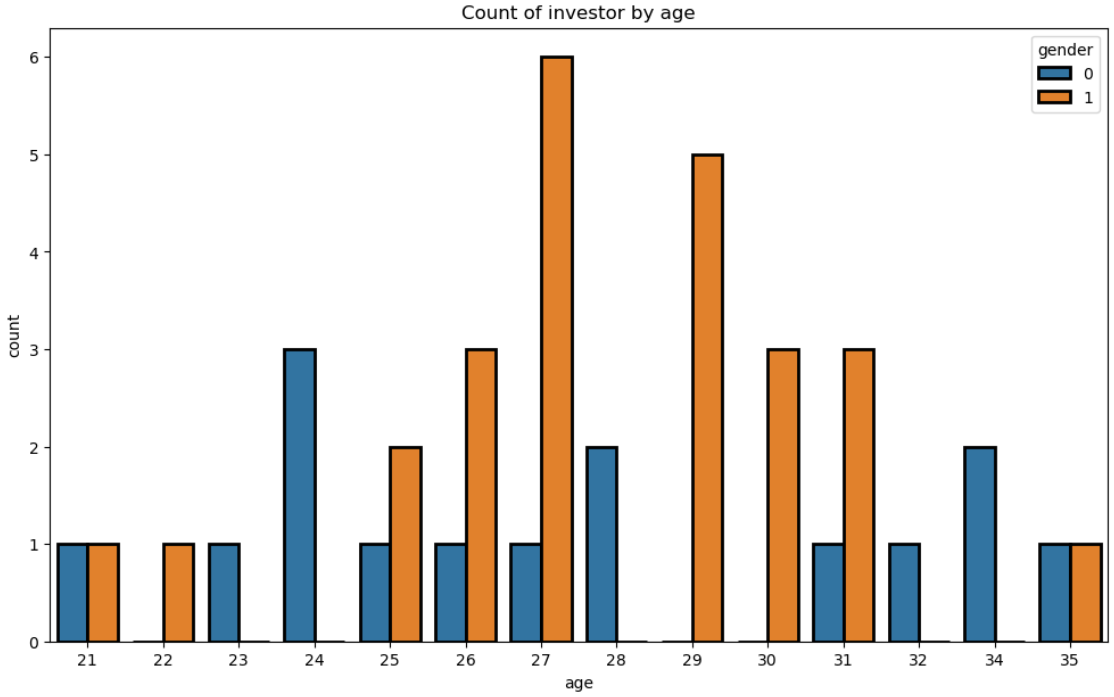
[40]:
```
data['gender']=data['gender'].replace({"Male":1,"Female":0})
```

[ ]:
```

```

[56]:
```
plt.figure(figsize=(12, 7))  #custom size of graph
sns.countplot(x=data['gender'],hue=data['What are your savings objectives?
  ↪'],linewidth=3,edgecolor='black')
plt.title("Reasons for savings by men and women respectively")
plt.show()
```



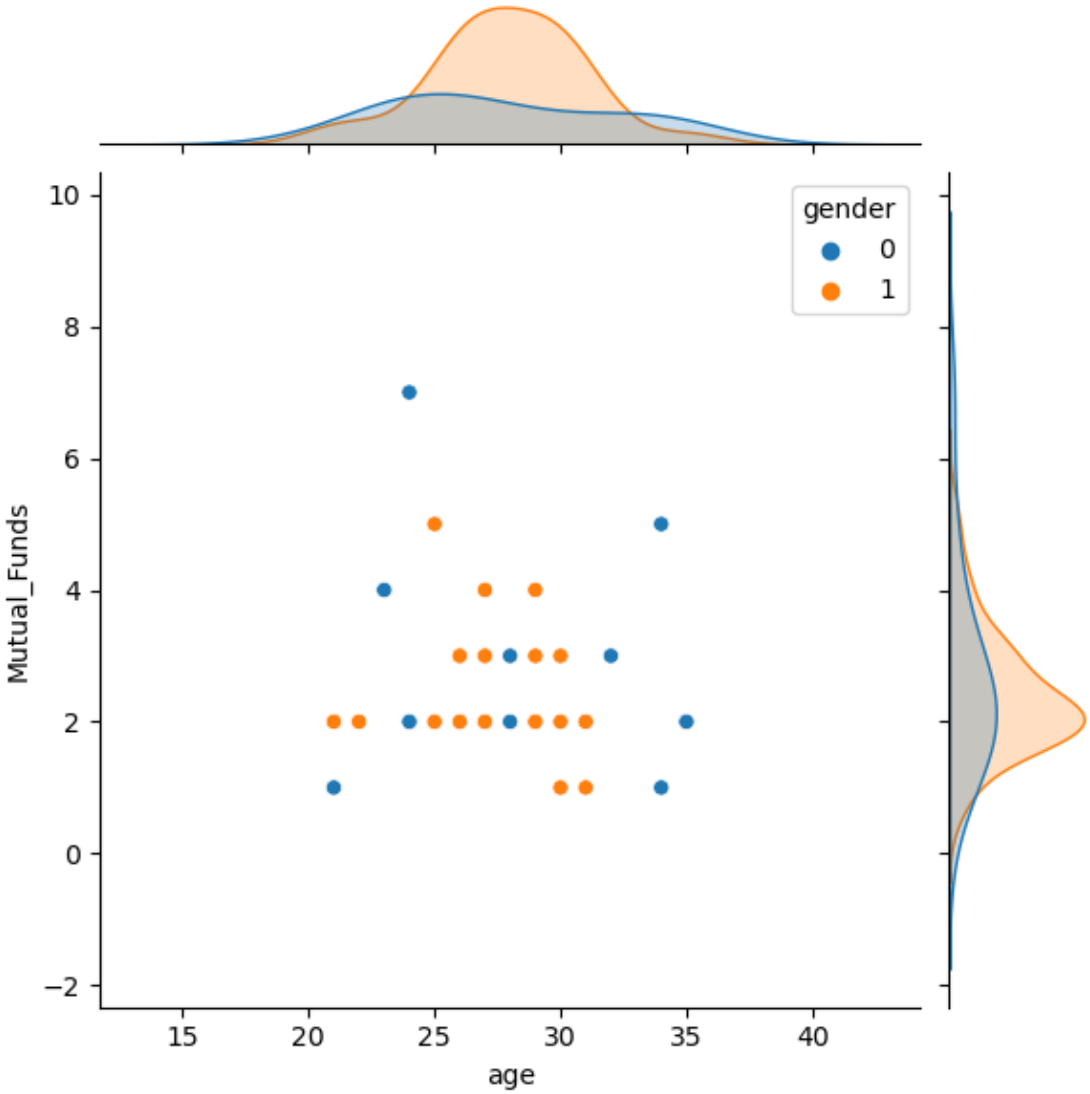
[60]:
```
plt.figure(figsize=(12,7))
sns.countplot(x=data['age'],hue=data['gender'], edgecolor='black',linewidth=2)
plt.title("Count of investor by age")
plt.figure(figsize=(12,7))
plt.show()
```




```
<Figure size 1200x700 with 0 Axes>
```

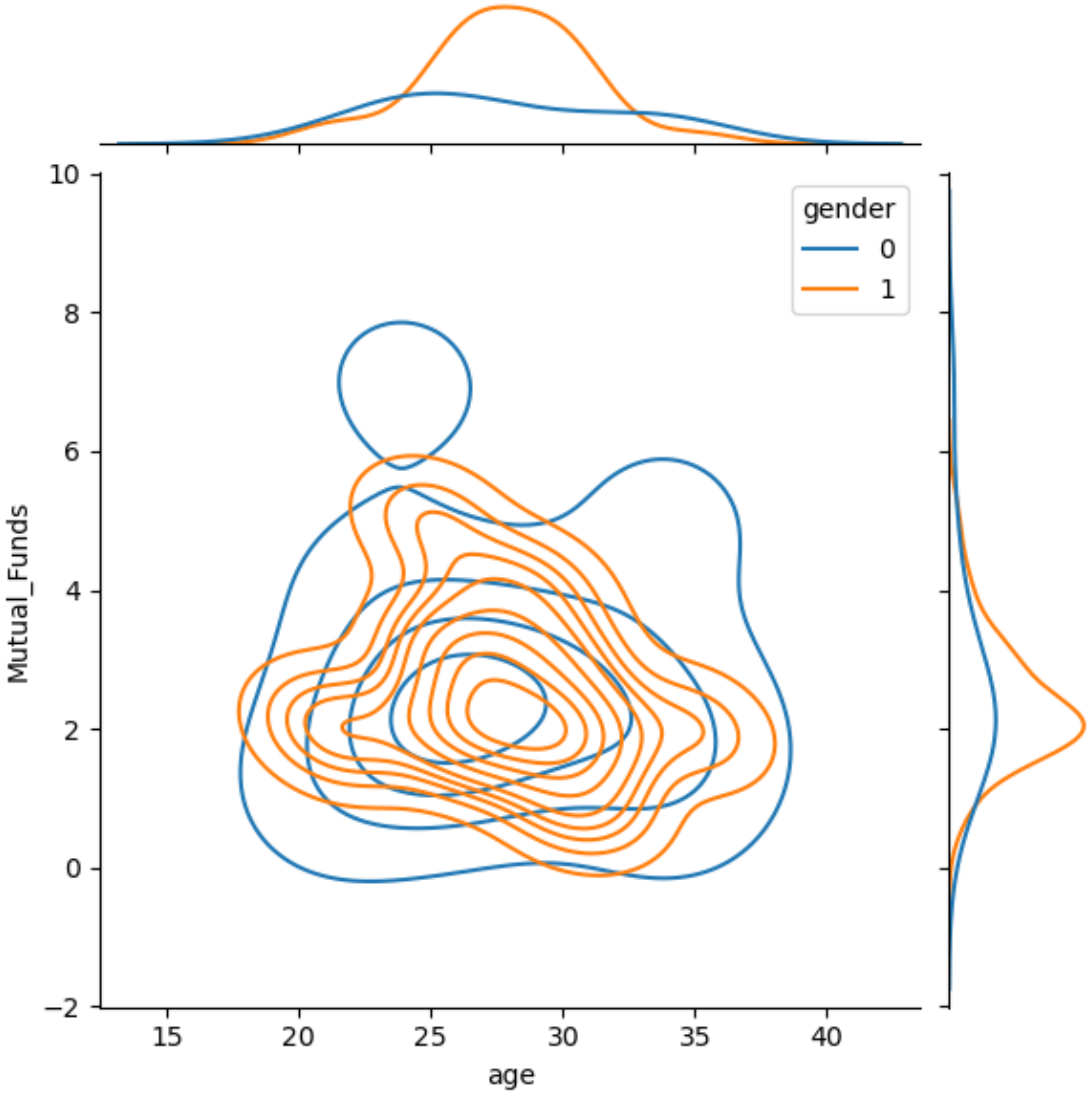
[62]:
```
plt.figure(figsize=(12,7))
sns.
  ↪jointplot(x=data['age'],y=data['Mutual_Funds'],color='green',hue=data['gender'])
plt.show()
```

```
<Figure size 1200x700 with 0 Axes>
```



[69]:
```
plt.figure(figsize=(12,7))
sns.
  ↪jointplot(x=data['age'],y=data['Mutual_Funds'],kind='kde',color='green',hue=data['gender'])
plt.show()
```

```
<Figure size 1200x700 with 0 Axes>
```



[70]:
```
data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 40 entries, 0 to 39
Data columns (total 24 columns):
 #   Column                          Non-Null Count  Dtype
---  ------                          --------------  -----
 0   gender                          40 non-null     int64
 1   age                             40 non-null     int64
 2   Investment_Avenues              40 non-null     object
 3   Mutual_Funds                    40 non-null     int64
 4   Equity_Market                   40 non-null     int64
 5   Debentures                      40 non-null     int64
```

```
 6   Government_Bonds                    40 non-null     int64
 7   Fixed_Deposits                      40 non-null     int64
 8   PPF                                 40 non-null     int64
 9   Gold                                40 non-null     int64
 10  Stock_Marktet                       40 non-null     object
 11  Factor                              40 non-null     object
 12  Objective                           40 non-null     object
 13  Purpose                             40 non-null     object
 14  Duration                            40 non-null     object
 15  Invest_Monitor                      40 non-null     object
 16  Expect                              40 non-null     object
 17  Avenue                              40 non-null     object
 18  What are your savings objectives?   40 non-null     object
 19  Reason_Equity                       40 non-null     object
 20  Reason_Mutual                       40 non-null     object
 21  Reason_Bonds                        40 non-null     object
 22  Reason_FD                           40 non-null     object
 23  Source                              40 non-null     object
dtypes: int64(9), object(15)
memory usage: 7.6+ KB
```

[71]:
```
data.describe()
```

[71]:

	gender	age	Mutual_Funds	Equity_Market	Debentures	\
count	40.00000	40.000000	40.000000	40.000000	40.000000	
mean	0.62500	27.800000	2.550000	3.475000	5.750000	
std	0.49029	3.560467	1.197219	1.131994	1.675617	
min	0.00000	21.000000	1.000000	1.000000	1.000000	
25%	0.00000	25.750000	2.000000	3.000000	5.000000	
50%	1.00000	27.000000	2.000000	4.000000	6.500000	
75%	1.00000	30.000000	3.000000	4.000000	7.000000	
max	1.00000	35.000000	7.000000	6.000000	7.000000	

	Government_Bonds	Fixed_Deposits	PPF	Gold
count	40.000000	40.000000	40.000000	40.000000
mean	4.650000	3.575000	2.025000	5.975000
std	1.369072	1.795828	1.609069	1.143263
min	1.000000	1.000000	1.000000	2.000000
25%	4.000000	2.750000	1.000000	6.000000
50%	5.000000	3.500000	1.000000	6.000000
75%	5.000000	5.000000	2.250000	7.000000
max	7.000000	7.000000	6.000000	7.000000

[72]:
```
data.describe().transpose()
```

[72]:

	count	mean	std	min	25%	50%	75%	max
gender	40.0	0.625	0.490290	0.0	0.00	1.0	1.00	1.0
age	40.0	27.800	3.560467	21.0	25.75	27.0	30.00	35.0

Mutual_Funds	40.0	2.550	1.197219	1.0	2.00	2.0	3.00	7.0
Equity_Market	40.0	3.475	1.131994	1.0	3.00	4.0	4.00	6.0
Debentures	40.0	5.750	1.675617	1.0	5.00	6.5	7.00	7.0
Government_Bonds	40.0	4.650	1.369072	1.0	4.00	5.0	5.00	7.0
Fixed_Deposits	40.0	3.575	1.795828	1.0	2.75	3.5	5.00	7.0
PPF	40.0	2.025	1.609069	1.0	1.00	1.0	2.25	6.0
Gold	40.0	5.975	1.143263	2.0	6.00	6.0	7.00	7.0

[73]:
```
data.isnull()
```

[73]:

	gender	age	Investment_Avenues	Mutual_Funds	Equity_Market	\
0	False	False	False	False	False	
1	False	False	False	False	False	
2	False	False	False	False	False	
3	False	False	False	False	False	
4	False	False	False	False	False	
5	False	False	False	False	False	
6	False	False	False	False	False	
7	False	False	False	False	False	
8	False	False	False	False	False	
9	False	False	False	False	False	
10	False	False	False	False	False	
11	False	False	False	False	False	
12	False	False	False	False	False	
13	False	False	False	False	False	
14	False	False	False	False	False	
15	False	False	False	False	False	
16	False	False	False	False	False	
17	False	False	False	False	False	
18	False	False	False	False	False	
19	False	False	False	False	False	
20	False	False	False	False	False	
21	False	False	False	False	False	
22	False	False	False	False	False	
23	False	False	False	False	False	
24	False	False	False	False	False	
25	False	False	False	False	False	
26	False	False	False	False	False	
27	False	False	False	False	False	
28	False	False	False	False	False	
29	False	False	False	False	False	
30	False	False	False	False	False	
31	False	False	False	False	False	
32	False	False	False	False	False	
33	False	False	False	False	False	
34	False	False	False	False	False	
35	False	False	False	False	False	

```
36   False  False              False         False          False
37   False  False              False         False          False
38   False  False              False         False          False
39   False  False              False         False          False

    Debentures  Government_Bonds  Fixed_Deposits    PPF   Gold  …  Duration  \
0        False             False           False  False  False  …     False
1        False             False           False  False  False  …     False
2        False             False           False  False  False  …     False
3        False             False           False  False  False  …     False
4        False             False           False  False  False  …     False
5        False             False           False  False  False  …     False
6        False             False           False  False  False  …     False
7        False             False           False  False  False  …     False
8        False             False           False  False  False  …     False
9        False             False           False  False  False  …     False
10       False             False           False  False  False  …     False
11       False             False           False  False  False  …     False
12       False             False           False  False  False  …     False
13       False             False           False  False  False  …     False
14       False             False           False  False  False  …     False
15       False             False           False  False  False  …     False
16       False             False           False  False  False  …     False
17       False             False           False  False  False  …     False
18       False             False           False  False  False  …     False
19       False             False           False  False  False  …     False
20       False             False           False  False  False  …     False
21       False             False           False  False  False  …     False
22       False             False           False  False  False  …     False
23       False             False           False  False  False  …     False
24       False             False           False  False  False  …     False
25       False             False           False  False  False  …     False
26       False             False           False  False  False  …     False
27       False             False           False  False  False  …     False
28       False             False           False  False  False  …     False
29       False             False           False  False  False  …     False
30       False             False           False  False  False  …     False
31       False             False           False  False  False  …     False
32       False             False           False  False  False  …     False
33       False             False           False  False  False  …     False
34       False             False           False  False  False  …     False
35       False             False           False  False  False  …     False
36       False             False           False  False  False  …     False
37       False             False           False  False  False  …     False
38       False             False           False  False  False  …     False
39       False             False           False  False  False  …     False
```

	Invest_Monitor	Expect	Avenue	What are your savings objectives?	\
0	False	False	False	False	
1	False	False	False	False	
2	False	False	False	False	
3	False	False	False	False	
4	False	False	False	False	
5	False	False	False	False	
6	False	False	False	False	
7	False	False	False	False	
8	False	False	False	False	
9	False	False	False	False	
10	False	False	False	False	
11	False	False	False	False	
12	False	False	False	False	
13	False	False	False	False	
14	False	False	False	False	
15	False	False	False	False	
16	False	False	False	False	
17	False	False	False	False	
18	False	False	False	False	
19	False	False	False	False	
20	False	False	False	False	
21	False	False	False	False	
22	False	False	False	False	
23	False	False	False	False	
24	False	False	False	False	
25	False	False	False	False	
26	False	False	False	False	
27	False	False	False	False	
28	False	False	False	False	
29	False	False	False	False	
30	False	False	False	False	
31	False	False	False	False	
32	False	False	False	False	
33	False	False	False	False	
34	False	False	False	False	
35	False	False	False	False	
36	False	False	False	False	
37	False	False	False	False	
38	False	False	False	False	
39	False	False	False	False	

	Reason_Equity	Reason_Mutual	Reason_Bonds	Reason_FD	Source
0	False	False	False	False	False
1	False	False	False	False	False
2	False	False	False	False	False
3	False	False	False	False	False

```
4          False          False          False      False   False
5          False          False          False      False   False
6          False          False          False      False   False
7          False          False          False      False   False
8          False          False          False      False   False
9          False          False          False      False   False
10         False          False          False      False   False
11         False          False          False      False   False
12         False          False          False      False   False
13         False          False          False      False   False
14         False          False          False      False   False
15         False          False          False      False   False
16         False          False          False      False   False
17         False          False          False      False   False
18         False          False          False      False   False
19         False          False          False      False   False
20         False          False          False      False   False
21         False          False          False      False   False
22         False          False          False      False   False
23         False          False          False      False   False
24         False          False          False      False   False
25         False          False          False      False   False
26         False          False          False      False   False
27         False          False          False      False   False
28         False          False          False      False   False
29         False          False          False      False   False
30         False          False          False      False   False
31         False          False          False      False   False
32         False          False          False      False   False
33         False          False          False      False   False
34         False          False          False      False   False
35         False          False          False      False   False
36         False          False          False      False   False
37         False          False          False      False   False
38         False          False          False      False   False
39         False          False          False      False   False

[40 rows x 24 columns]
```

[74]:
```
data.isnull().sum()
```

[74]:
```
gender                    0
age                       0
Investment_Avenues        0
Mutual_Funds              0
Equity_Market             0
Debentures                0
```

```
Government_Bonds                    0
Fixed_Deposits                      0
PPF                                 0
Gold                                0
Stock_Marktet                       0
Factor                              0
Objective                           0
Purpose                             0
Duration                            0
Invest_Monitor                      0
Expect                              0
Avenue                              0
What are your savings objectives?   0
Reason_Equity                       0
Reason_Mutual                       0
Reason_Bonds                        0
Reason_FD                           0
Source                              0
dtype: int64
```

[115]:
```
data.drop_duplicates().head()
```

[115]:

	gender	age	Investment_Avenues	Mutual_Funds	Equity_Market	Debentures	\
0	0	34	Yes	1	2	5	
1	0	23	Yes	4	3	2	
2	1	30	Yes	3	6	4	
3	1	22	Yes	2	1	3	
4	0	24	No	2	1	3	

	Government_Bonds	Fixed_Deposits	PPF	Gold	…	Duration	\
0	3	7	6	4	…	1-3 years	
1	1	5	6	7	…	More than 5 years	
2	2	5	1	7	…	3-5 years	
3	7	6	4	5	…	Less than 1 year	
4	6	4	5	7	…	Less than 1 year	

	Invest_Monitor	Expect	Avenue	What are your savings objectives?	\
0	Monthly	20%-30%	Mutual Fund	Retirement Plan	
1	Weekly	20%-30%	Mutual Fund	Health Care	
2	Daily	20%-30%	Equity	Retirement Plan	
3	Daily	10%-20%	Equity	Retirement Plan	
4	Daily	20%-30%	Equity	Retirement Plan	

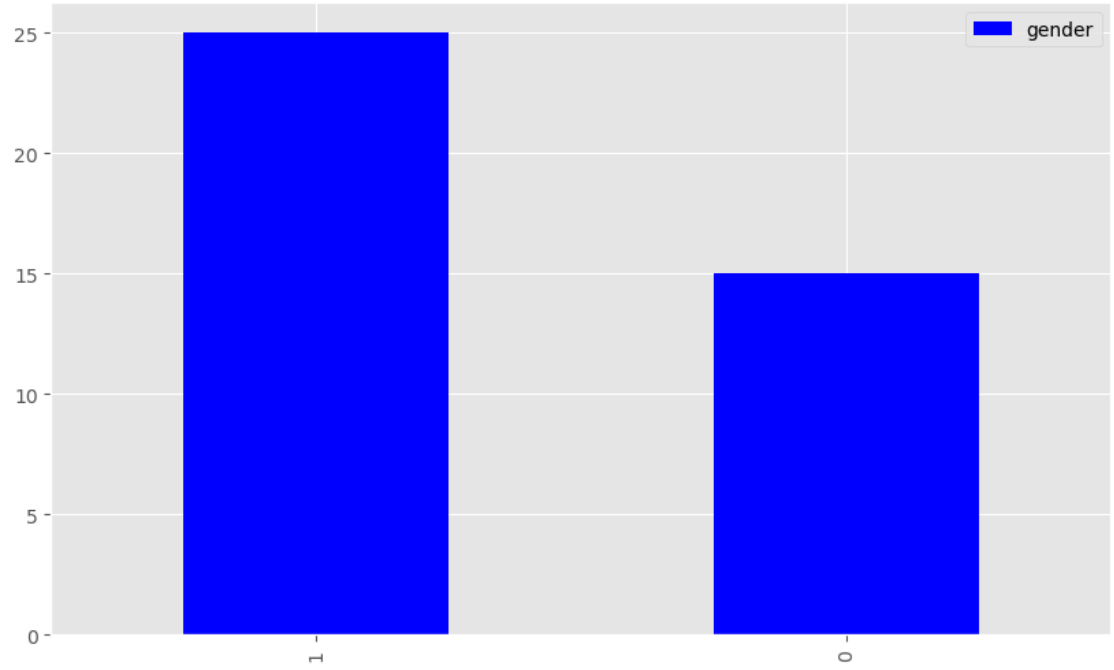
	Reason_Equity	Reason_Mutual	Reason_Bonds	\
0	Capital Appreciation	Better Returns	Safe Investment	
1	Dividend	Better Returns	Safe Investment	
2	Capital Appreciation	Tax Benefits	Assured Returns	

```
3              Dividend  Fund Diversification   Tax Incentives
4  Capital Appreciation        Better Returns  Safe Investment

             Reason_FD                    Source
0        Fixed Returns  Newspapers and Magazines
1  High Interest Rates     Financial Consultants
2        Fixed Returns                 Television
3  High Interest Rates                   Internet
4            Risk Free                   Internet

[5 rows x 24 columns]
```

[114]:
```
data['gender'].value_counts()
```

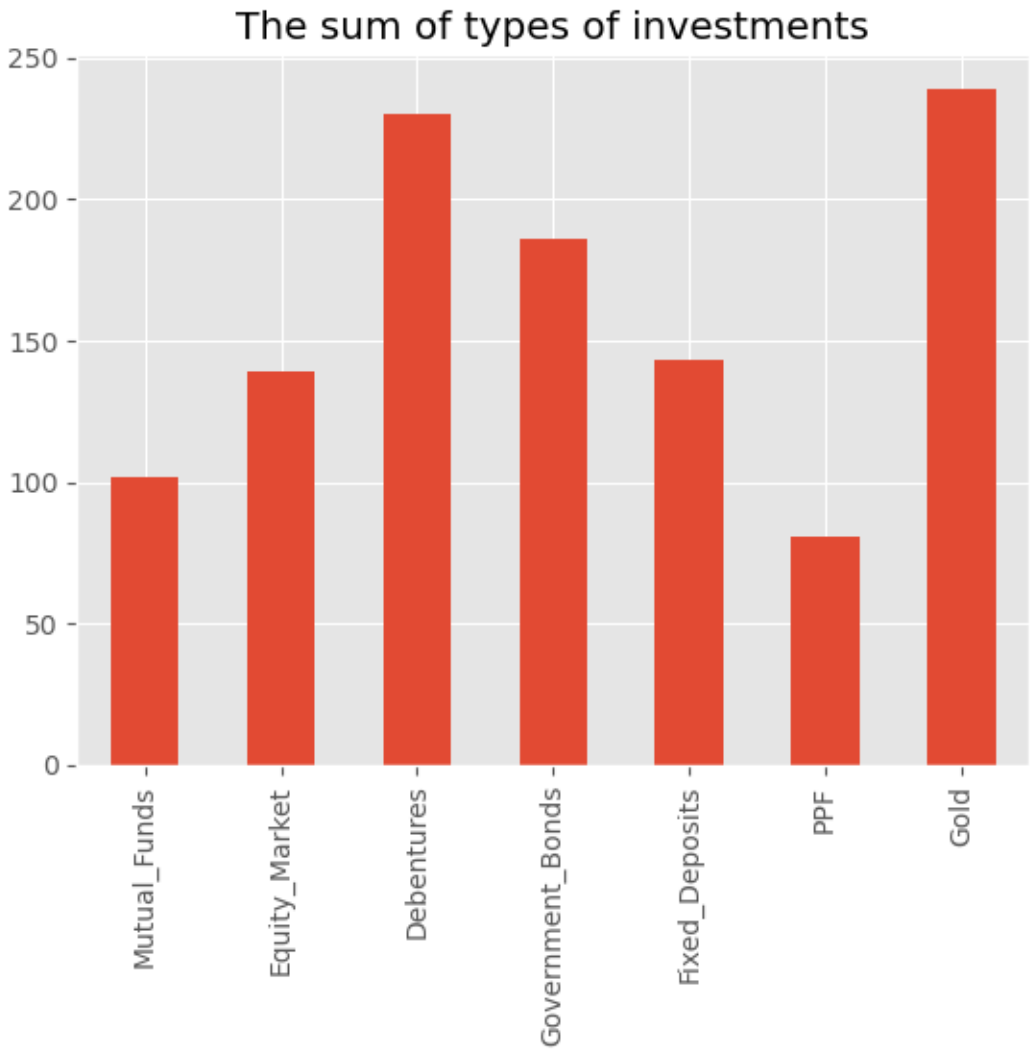
[114]:
```
1    25
0    15
Name: gender, dtype: int64
```

[80]:
```
plt.style.use('ggplot')
data['gender'].value_counts().plot(kind='bar',figsize=(10,6),color='blue')
plt.legend()
plt.show()
```

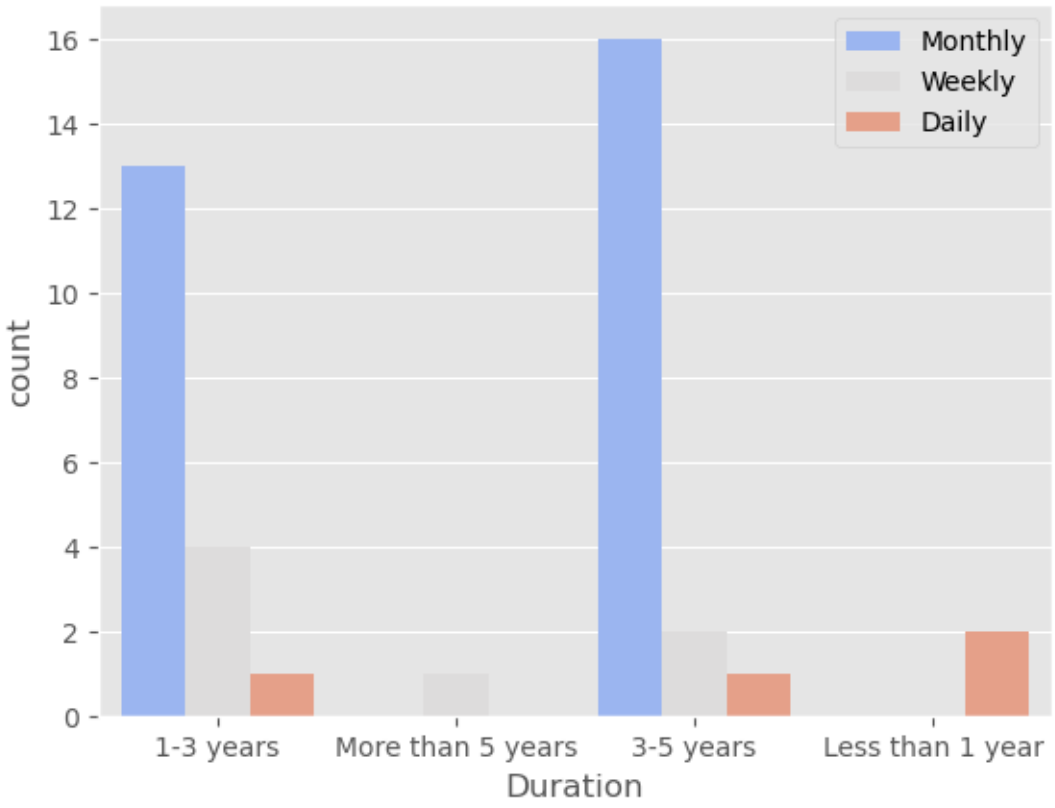


[82]:
```
data.iloc[:,3:10].sum().plot(kind='bar')
plt.title("The sum of types of investments")
```

```
plt.show()
```



[84]:
```
sns.countplot(x=data['Duration'],hue=data['Invest_Monitor'],palette='coolwarm')
plt.legend(loc='upper right')
plt.show()
```



[96]:
```
data[["Duration","Avenue","Source"]].head(10)
```

[96]:

	Duration	Avenue	Source
0	1-3 years	Mutual Fund	Newspapers and Magazines
1	More than 5 years	Mutual Fund	Financial Consultants
2	3-5 years	Equity	Television
3	Less than 1 year	Equity	Internet
4	Less than 1 year	Equity	Internet
5	1-3 years	Mutual Fund	Internet
6	3-5 years	Equity	Financial Consultants
7	3-5 years	Mutual Fund	Newspapers and Magazines
8	1-3 years	Equity	Television
9	3-5 years	Fixed Deposits	Newspapers and Magazines

[97]:
```
data.iloc[0]
```

[97]:
```
gender                0
age                  34
Investment_Avenues  Yes
Mutual_Funds          1
Equity_Market         2
```

```
Debentures                                                    5
Government_Bonds                                              3
Fixed_Deposits                                                7
PPF                                                           6
Gold                                                          4
Stock_Marktet                                               Yes
Factor                                                  Returns
Objective                                  Capital Appreciation
Purpose                                        Wealth Creation
Duration                                             1-3 years
Invest_Monitor                                         Monthly
Expect                                                 20%-30%
Avenue                                             Mutual Fund
What are your savings objectives?                Retirement Plan
Reason_Equity                              Capital Appreciation
Reason_Mutual                                   Better Returns
Reason_Bonds                                 Safe Investment
Reason_FD                                      Fixed Returns
Source                                 Newspapers and Magazines
Name: 0, dtype: object
```

[98]:
```
data.iloc[1:4]
```

[98]:
```
   gender  age Investment_Avenues  Mutual_Funds  Equity_Market  Debentures  \
1       0   23                Yes             4              3           2
2       1   30                Yes             3              6           4
3       1   22                Yes             2              1           3

   Government_Bonds  Fixed_Deposits  PPF  Gold  …           Duration  \
1                 1               5    6     7  …  More than 5 years
2                 2               5    1     7  …          3-5 years
3                 7               6    4     5  …   Less than 1 year

  Invest_Monitor   Expect       Avenue What are your savings objectives?  \
1         Weekly  20%-30%  Mutual Fund                      Health Care
2          Daily  20%-30%       Equity                 Retirement Plan
3          Daily  10%-20%       Equity                 Retirement Plan

          Reason_Equity         Reason_Mutual     Reason_Bonds  \
1              Dividend        Better Returns  Safe Investment
2  Capital Appreciation          Tax Benefits  Assured Returns
3              Dividend  Fund Diversification   Tax Incentives

             Reason_FD                Source
1  High Interest Rates  Financial Consultants
2        Fixed Returns             Television
3  High Interest Rates               Internet
```

```
[3 rows x 24 columns]
```

[106]:
```
data[data['gender']==0].count()
```

[106]:
```
gender                                 15
age                                    15
Investment_Avenues                     15
Mutual_Funds                           15
Equity_Market                          15
Debentures                             15
Government_Bonds                       15
Fixed_Deposits                         15
PPF                                    15
Gold                                   15
Stock_Marktet                          15
Factor                                 15
Objective                              15
Purpose                                15
Duration                               15
Invest_Monitor                         15
Expect                                 15
Avenue                                 15
What are your savings objectives?      15
Reason_Equity                          15
Reason_Mutual                          15
Reason_Bonds                           15
Reason_FD                              15
Source                                 15
dtype: int64
```

[108]:
```
data[data['gender']==1].count()
```

[108]:
```
gender                                 25
age                                    25
Investment_Avenues                     25
Mutual_Funds                           25
Equity_Market                          25
Debentures                             25
Government_Bonds                       25
Fixed_Deposits                         25
PPF                                    25
Gold                                   25
Stock_Marktet                          25
Factor                                 25
Objective                              25
Purpose                                25
```

```
Duration                              25
Invest_Monitor                        25
Expect                                25
Avenue                                25
What are your savings objectives?     25
Reason_Equity                         25
Reason_Mutual                         25
Reason_Bonds                          25
Reason_FD                             25
Source                                25
dtype: int64
```

[109]:
```
data.corr()
```

```
C:\Users\morea\AppData\Local\Temp\ipykernel_16356\2627137660.py:1:
FutureWarning: The default value of numeric_only in DataFrame.corr is
deprecated. In a future version, it will default to False. Select only valid
columns or specify the value of numeric_only to silence this warning.
  data.corr()
```

[109]:

	gender	age	Mutual_Funds	Equity_Market	Debentures	\
gender	1.000000	0.014688	-0.120127	0.098174	0.257491	
age	0.014688	1.000000	-0.123914	0.246840	0.326638	
Mutual_Funds	-0.120127	-0.123914	1.000000	0.332043	-0.351495	
Equity_Market	0.098174	0.246840	0.332043	1.000000	-0.016898	
Debentures	0.257491	0.326638	-0.351495	-0.016898	1.000000	
Government_Bonds	0.181447	-0.093632	-0.114198	-0.237420	0.430323	
Fixed_Deposits	-0.273016	-0.033685	-0.031604	-0.238705	-0.470791	
PPF	-0.150321	-0.263167	-0.193665	-0.429003	-0.511169	
Gold	0.074334	-0.057952	-0.401830	-0.050027	-0.137195	

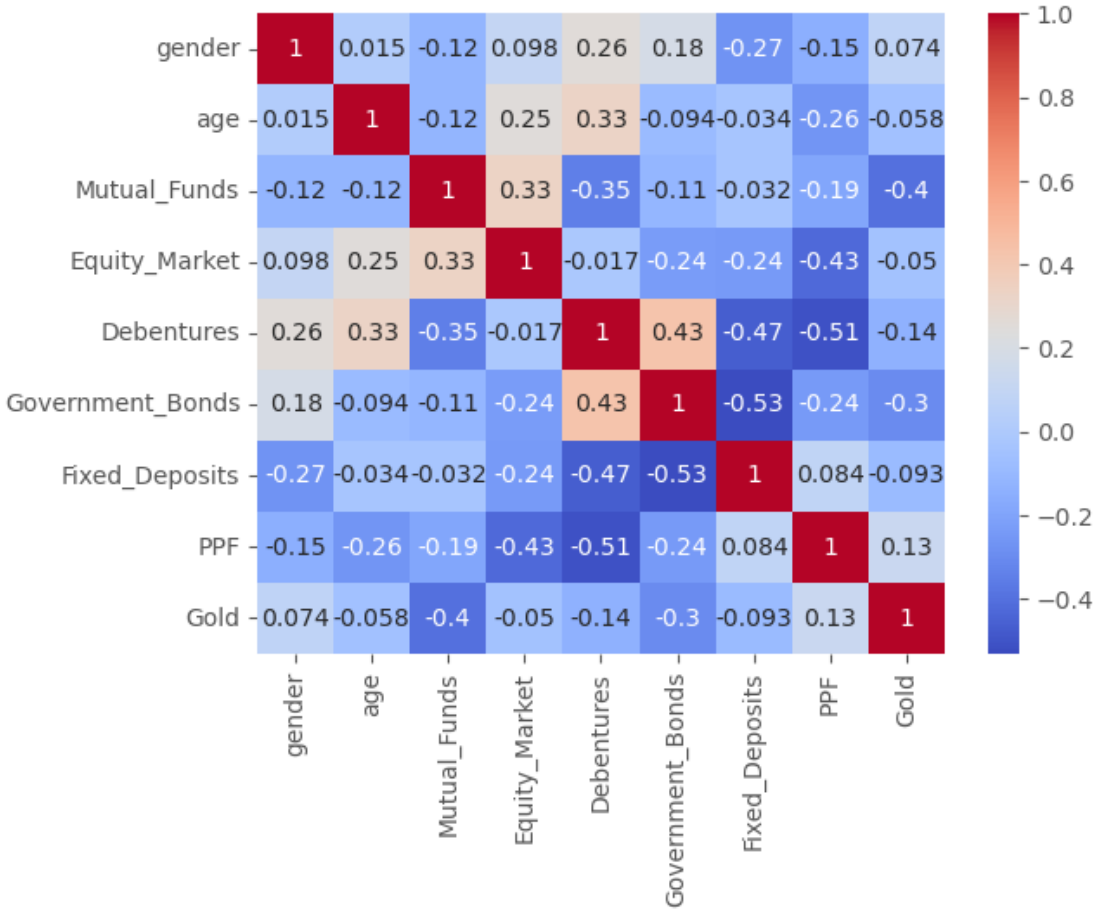
	Government_Bonds	Fixed_Deposits	PPF	Gold
gender	0.181447	-0.273016	-0.150321	0.074334
age	-0.093632	-0.033685	-0.263167	-0.057952
Mutual_Funds	-0.114198	-0.031604	-0.193665	-0.401830
Equity_Market	-0.237420	-0.238705	-0.429003	-0.050027
Debentures	0.430323	-0.470791	-0.511169	-0.137195
Government_Bonds	1.000000	-0.531359	-0.240356	-0.300607
Fixed_Deposits	-0.531359	1.000000	0.083633	-0.092730
PPF	-0.240356	0.083633	1.000000	0.125795
Gold	-0.300607	-0.092730	0.125795	1.000000

[113]:
```
sns.heatmap(data.corr(),cmap='coolwarm',annot=True)
```

```
C:\Users\morea\AppData\Local\Temp\ipykernel_16356\3331653679.py:1:
FutureWarning: The default value of numeric_only in DataFrame.corr is
deprecated. In a future version, it will default to False. Select only valid
columns or specify the value of numeric_only to silence this warning.
```

```
sns.heatmap(data.corr(),cmap='coolwarm',annot=True)
```

[113]: <Axes: >



[ ]:

[ ]: