In [1]:

```
# This Python 3 environment comes with many helpful analytics libraries installed
# It is defined by the kaggle/python docker image: https://github.com/kaggle/docker-python
# For example, here's several helpful packages to load in

import numpy as np # linear algebra
import pandas as pd # data processing, CSV file I/O (e.g. pd.read_csv)
import seaborn as sns
import matplotlib.pyplot as plt

import os
for dirname, _, filenames in os.walk('/kaggle/input'):
    for filename in filenames:
        print(os.path.join(dirname, filename))

# Any results you write to the current directory are saved as output.
```

In [2]:

```
income_df=pd.read_csv(r"C:\Users\santo\OneDrive\Music\24-25 nov\24th, 25th -  Intro to Stats, Descriptive Stats\PROJECT\Inc_Ex
```

In [3]:

```
income_df
```

Out[3]:

	Mthly_HH_Income	Mthly_HH_Expense	No_of_Fly_Members	Emi_or_Rent_Amt	Annual_HH_Income	Highest_Qualified_Member	No_of_Ea
0	5000	8000	3	2000	64200	Under-Graduate	
1	6000	7000	2	3000	79920	Illiterate	
2	10000	4500	2	0	112800	Under-Graduate	
3	10000	2000	1	0	97200	Illiterate	
4	12500	12000	2	3000	147000	Graduate	
5	14000	8000	2	0	196560	Graduate	
6	15000	16000	3	35000	167400	Post-Graduate	
7	18000	20000	5	8000	216000	Graduate	
8	19000	9000	2	0	218880	Under-Graduate	
9	20000	9000	4	0	220800	Under-Graduate	
10	20000	18000	4	8000	278400	Under-Graduate	
11	22000	25000	6	12000	279840	Illiterate	
12	23400	5000	3	0	292032	Illiterate	
13	24000	10500	6	0	316800	Graduate	
14	24000	10000	4	0	244800	Graduate	
15	25000	12300	3	0	246000	Graduate	
16	25000	20000	3	3500	261000	Graduate	
17	25000	10000	6	0	258000	Under-Graduate	
18	29000	6600	2	2000	348000	Graduate	
19	30000	13000	4	0	385200	Graduate	
20	30500	25000	5	5000	351360	Under-Graduate	
21	32000	15000	4	0	445440	Professional	

	Mthly_HH_Income	Mthly_HH_Expense	No_of_Fly_Members	Emi_or_Rent_Amt	Annual_HH_Income	Highest_Qualified_Member	No_of_Ea
22	34000	19000	6	0	330480	Professional	
23	34000	25000	3	4000	469200	Professional	
24	35000	12000	3	0	466200	Graduate	
25	35000	25000	4	0	449400	Professional	
26	39000	8000	4	0	556920	Under-Graduate	
27	40000	10000	4	0	412800	Under-Graduate	
28	42000	15000	4	0	488880	Graduate	
29	43000	12000	4	0	619200	Graduate	
30	45000	25000	6	0	523800	Graduate	
31	45000	40000	6	3500	507600	Professional	
32	45000	10000	2	1000	437400	Post-Graduate	
33	45000	22000	4	2500	610200	Post-Graduate	
34	46000	25000	5	3500	596160	Graduate	
35	47000	15000	7	0	456840	Professional	
36	50000	20000	4	0	570000	Professional	
37	50500	20000	3	0	581760	Professional	
38	55000	45000	6	12000	600600	Graduate	
39	60000	10000	3	0	590400	Post-Graduate	
40	60000	50000	6	10000	590400	Graduate	
41	65000	20000	4	5000	647400	Illiterate	
42	70000	9000	2	0	756000	Graduate	
43	80000	20000	4	0	1075200	Graduate	

	Mthly_HH_Income	Mthly_HH_Expense	No_of_Fly_Members	Emi_or_Rent_Amt	Annual_HH_Income	Highest_Qualified_Member	No_of_Ea
44	85000	25000	5	0	1142400	Under-Graduate	
45	90000	48000	7	0	885600	Post-Graduate	
46	98000	25000	5	0	1152480	Professional	
47	100000	30000	6	0	1404000	Graduate	
48	100000	50000	4	20000	1032000	Professional	
49	100000	40000	6	10000	1320000	Post-Graduate	

In [4]:

```
income_df.head()
```

Out[4]:

	Mthly_HH_Income	Mthly_HH_Expense	No_of_Fly_Members	Emi_or_Rent_Amt	Annual_HH_Income	Highest_Qualified_Member	No_of_Ear
0	5000	8000	3	2000	64200	Under-Graduate	
1	6000	7000	2	3000	79920	Illiterate	
2	10000	4500	2	0	112800	Under-Graduate	
3	10000	2000	1	0	97200	Illiterate	
4	12500	12000	2	3000	147000	Graduate	

In [5]:

```
income_df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 50 entries, 0 to 49
Data columns (total 7 columns):
 #   Column                   Non-Null Count  Dtype 
---  ------                   --------------  ----- 
 0   Mthly_HH_Income          50 non-null     int64 
 1   Mthly_HH_Expense         50 non-null     int64 
 2   No_of_Fly_Members        50 non-null     int64 
 3   Emi_or_Rent_Amt          50 non-null     int64 
 4   Annual_HH_Income         50 non-null     int64 
 5   Highest_Qualified_Member 50 non-null     object
 6   No_of_Earning_Members    50 non-null     int64 
dtypes: int64(6), object(1)
memory usage: 2.9+ KB
```

In [6]:

```
income_df.head(2)
```

Out[6]:

	Mthly_HH_Income	Mthly_HH_Expense	No_of_Fly_Members	Emi_or_Rent_Amt	Annual_HH_Income	Highest_Qualified_Member	No_of_Ear
0	5000	8000	3	2000	64200	Under-Graduate	
1	6000	7000	2	3000	79920	Illiterate	

In [7]:

```
income_df.shape
```

Out[7]:

```
(50, 7)
```

In [8]:

```
income_df.columns
```

Out[8]:

```
Index(['Mthly_HH_Income', 'Mthly_HH_Expense', 'No_of_Fly_Members',
       'Emi_or_Rent_Amt', 'Annual_HH_Income', 'Highest_Qualified_Member',
       'No_of_Earning_Members'],
      dtype='object')
```

In [9]:

```
len(income_df.columns)
```

Out[9]:

```
7
```

In [11]:
```
income_df.describe()
```

Out[11]:

	Mthly_HH_Income	Mthly_HH_Expense	No_of_Fly_Members	Emi_or_Rent_Amt	Annual_HH_Income	No_of_Earning_Members
count	50.000000	50.000000	50.000000	50.000000	5.000000e+01	50.000000
mean	41558.000000	18818.000000	4.060000	3060.000000	4.900190e+05	1.460000
std	26097.908979	12090.216824	1.517382	6241.434948	3.201358e+05	0.734291
min	5000.000000	2000.000000	1.000000	0.000000	6.420000e+04	1.000000
25%	23550.000000	10000.000000	3.000000	0.000000	2.587500e+05	1.000000
50%	35000.000000	15500.000000	4.000000	0.000000	4.474200e+05	1.000000
75%	50375.000000	25000.000000	5.000000	3500.000000	5.947200e+05	2.000000
max	100000.000000	50000.000000	7.000000	35000.000000	1.404000e+06	4.000000

In [12]:
```
income_df.describe().T
```

Out[12]:

	count	mean	std	min	25%	50%	75%	max
Mthly_HH_Income	50.0	41558.00	26097.908979	5000.0	23550.0	35000.0	50375.0	100000.0
Mthly_HH_Expense	50.0	18818.00	12090.216824	2000.0	10000.0	15500.0	25000.0	50000.0
No_of_Fly_Members	50.0	4.06	1.517382	1.0	3.0	4.0	5.0	7.0
Emi_or_Rent_Amt	50.0	3060.00	6241.434948	0.0	0.0	0.0	3500.0	35000.0
Annual_HH_Income	50.0	490019.04	320135.792123	64200.0	258750.0	447420.0	594720.0	1404000.0
No_of_Earning_Members	50.0	1.46	0.734291	1.0	1.0	1.0	2.0	4.0

In [13]:
```
income_df.isna().any()
```

Out[13]:

```
Mthly_HH_Income            False
Mthly_HH_Expense           False
No_of_Fly_Members          False
Emi_or_Rent_Amt            False
Annual_HH_Income           False
Highest_Qualified_Member   False
No_of_Earning_Members      False
dtype: bool
```

In [14]:

```
income_df.isna()
```

Out[14]:

	Mthly_HH_Income	Mthly_HH_Expense	No_of_Fly_Members	Emi_or_Rent_Amt	Annual_HH_Income	Highest_Qualified_Member	No_of_Ea
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	

	Mthly_HH_Income	Mthly_HH_Expense	No_of_Fly_Members	Emi_or_Rent_Amt	Annual_HH_Income	Highest_Qualified_Member	No_of_Ea
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	
40	False	False	False	False	False	False	
41	False	False	False	False	False	False	
42	False	False	False	False	False	False	
43	False	False	False	False	False	False	

	Mthly_HH_Income	Mthly_HH_Expense	No_of_Fly_Members	Emi_or_Rent_Amt	Annual_HH_Income	Highest_Qualified_Member	No_of_Ea
44	False	False	False	False	False	False	
45	False	False	False	False	False	False	
46	False	False	False	False	False	False	
47	False	False	False	False	False	False	
48	False	False	False	False	False	False	
49	False	False	False	False	False	False	

```
In [15]: income_df.isnull()
```

Out[15]:

	Mthly_HH_Income	Mthly_HH_Expense	No_of_Fly_Members	Emi_or_Rent_Amt	Annual_HH_Income	Highest_Qualified_Member	No_of_Ea
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	

	Mthly_HH_Income	Mthly_HH_Expense	No_of_Fly_Members	Emi_or_Rent_Amt	Annual_HH_Income	Highest_Qualified_Member	No_of_Ea
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	
40	False	False	False	False	False	False	
41	False	False	False	False	False	False	
42	False	False	False	False	False	False	
43	False	False	False	False	False	False	

	Mthly_HH_Income	Mthly_HH_Expense	No_of_Fly_Members	Emi_or_Rent_Amt	Annual_HH_Income	Highest_Qualified_Member	No_of_Ea
44	False	False	False	False	False	False	
45	False	False	False	False	False	False	
46	False	False	False	False	False	False	
47	False	False	False	False	False	False	
48	False	False	False	False	False	False	
49	False	False	False	False	False	False	

In [16]:

```
income_df["Mthly_HH_Expense"].mean()
```

Out[16]:

```
np.float64(18818.0)
```

In [17]:

```
income_df["Mthly_HH_Expense"].median()
```

Out[17]:

```
15500.0
```

In [18]:

```
mth_exp_tmp = pd.crosstab(index=income_df["Mthly_HH_Expense"], columns="count")
mth_exp_tmp.reset_index(inplace=True)
mth_exp_tmp[mth_exp_tmp['count'] == income_df.Mthly_HH_Expense.value_counts().max()]
```

Out[18]:

col_0	Mthly_HH_Expense	count
18	25000	8

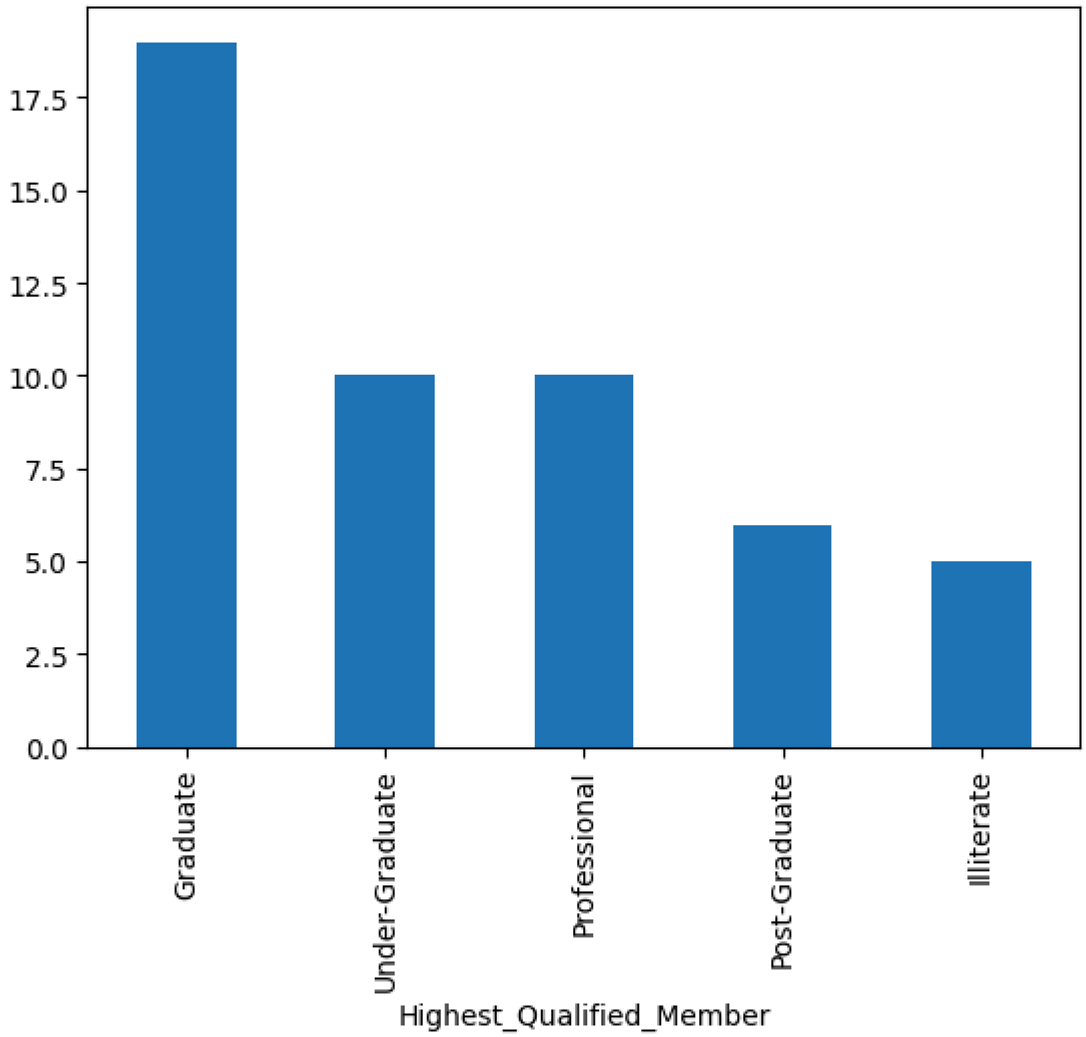
7.Plot the Histogram to count the Highest qualified member

In [19]:

```
income_df["Highest_Qualified_Member"].value_counts().plot(kind="bar")
```

Out[19]:

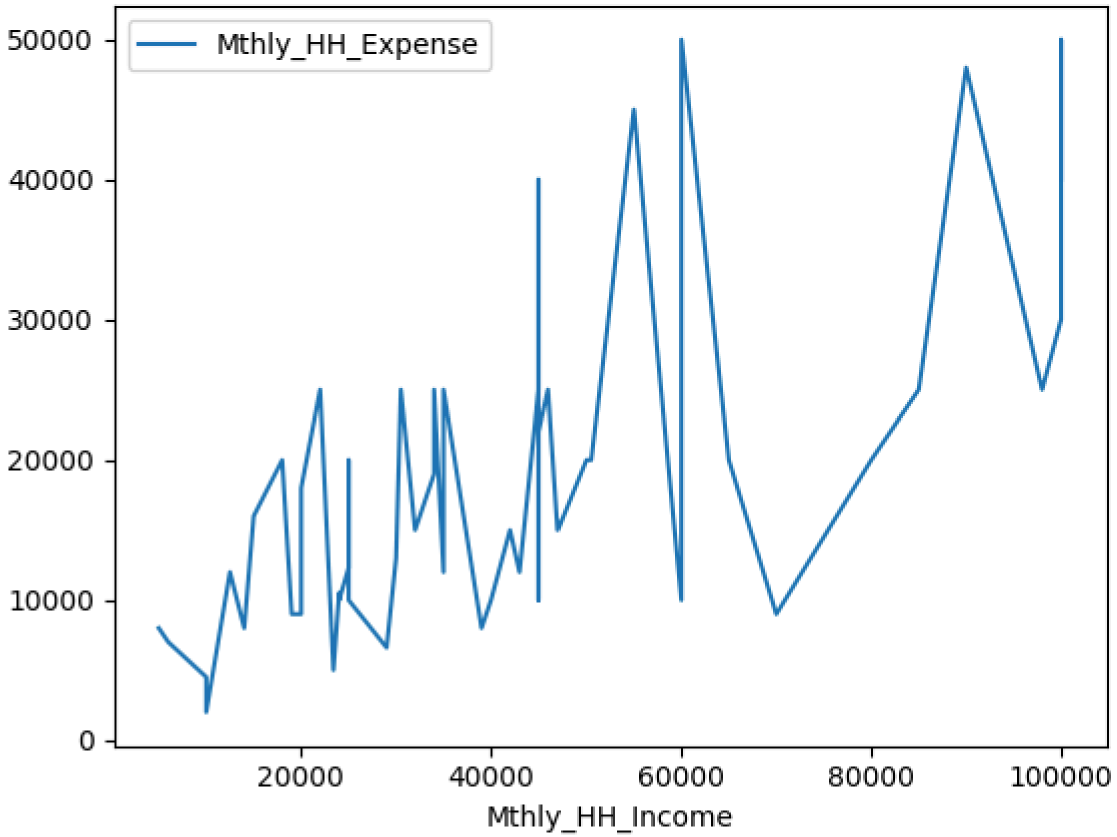
```
<Axes: xlabel='Highest_Qualified_Member'>
```



8.Calculate IQR(difference between 75% and 25% quartile)

In [20]:
```
income_df.plot(x="Mthly_HH_Income", y="Mthly_HH_Expense")
IQR=income_df["Mthly_HH_Expense"].quantile(0.75)-income_df["Mthly_HH_Expense"].quantile(0.25)
IQR
```

```
Out[20]:  np.float64(15000.0)
```



9.Calculate Standard Deviation for first 4 columns.

```
In [21]:  pd.DataFrame(income_df.iloc[:,0:5].std().to_frame()).T
```

Out[21]:

	Mthly_HH_Income	Mthly_HH_Expense	No_of_Fly_Members	Emi_or_Rent_Amt	Annual_HH_Income
0	26097.908979	12090.216824	1.517382	6241.434948	320135.792123

10.Calculate Variance for first 3 columns.

In [22]:

```
pd.DataFrame(income_df.iloc[:,0:4].var().to_frame()).T
```

Out[22]:

	Mthly_HH_Income	Mthly_HH_Expense	No_of_Fly_Members	Emi_or_Rent_Amt
0	6.811009e+08	1.461733e+08	2.302449	3.895551e+07

In [23]:

```
income_df["Highest_Qualified_Member"].value_counts().to_frame().T
```

Out[23]:

Highest_Qualified_Member	Graduate	Under-Graduate	Professional	Post-Graduate	Illiterate
count	19	10	10	6	5

In [24]:

```
income_df["Highest_Qualified_Member"].value_counts().to_frame().T
```

Out[24]:

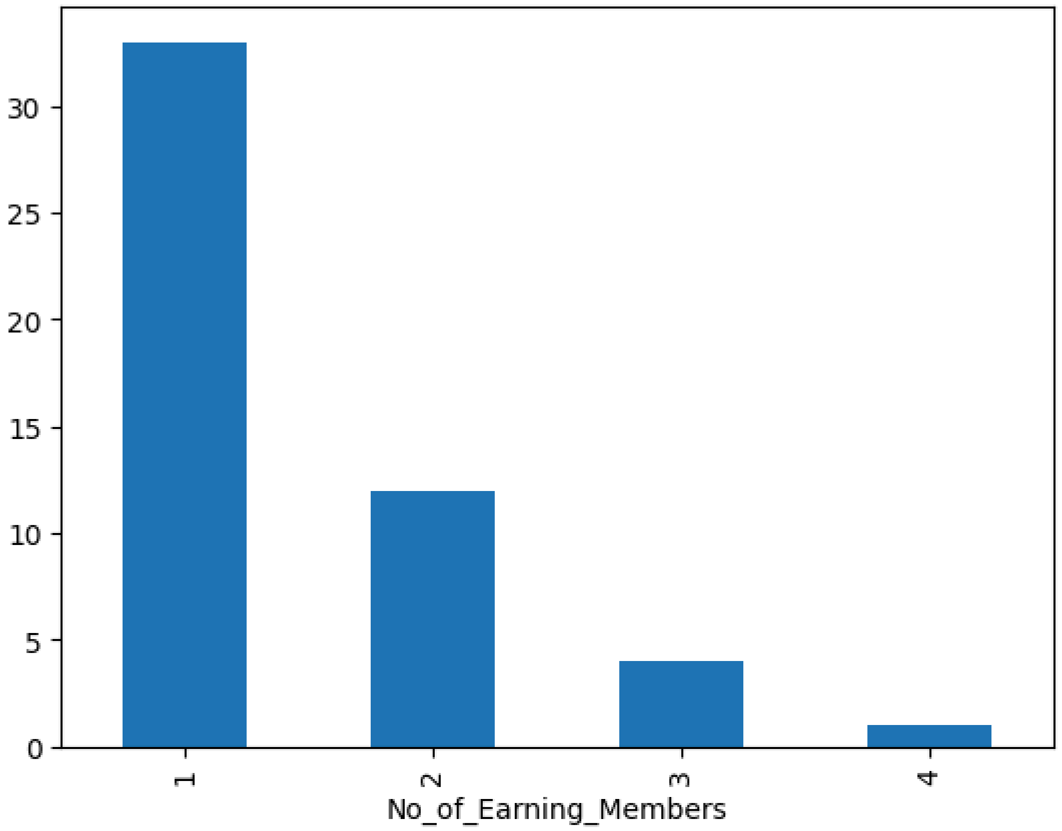
Highest_Qualified_Member	Graduate	Under-Graduate	Professional	Post-Graduate	Illiterate
count	19	10	10	6	5

In [25]:

```
income_df["No_of_Earning_Members"].value_counts().plot(kind="bar")
```

Out[25]:

```
<Axes: xlabel='No_of_Earning_Members'>
```



In [26]:
```
income_df['Mthly_HH_Expense'].std()
```

Out[26]:
```
12090.216824240286
```

In [27]:
```
#Here we need to calculate the coeff of variation

Coeff_of_var_StockA=10/15
print(Coeff_of_var_StockA)
Coeff_of_var_StockB=5/10
print(Coeff_of_var_StockB)
```

```
0.6666666666666666
0.5
```

In [ ]: