

```
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt
from sklearn.cluster import KMeans
import warnings
warnings.filterwarnings('ignore')

df = pd.read_csv("C:/Users/tushi/Downloads/Mall_Customers.csv")
df.head()
```

	CustomerID	Gender	Age	Annual Income (k\$)	Spending Score (1-100)
0	1	Male	19	15	39
1	2	Male	21	15	81
2	3	Female	20	16	6
3	4	Female	23	16	77
4	5	Female	31	17	40

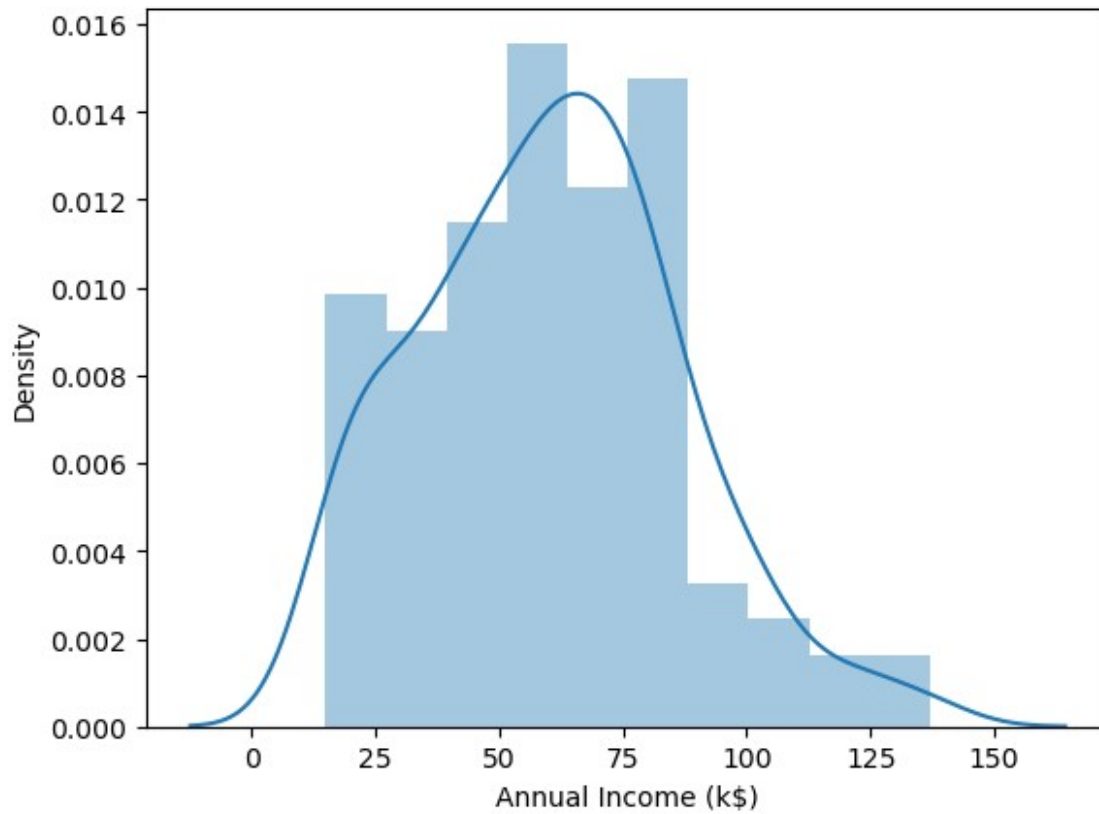
Univariate Analysis

```
df.describe()
```

	CustomerID	Age	Annual Income (k\$)	Spending Score (1-100)
count	200.000000	200.000000	200.000000	200.000000
mean	100.500000	38.850000	60.560000	50.200000
std	57.879185	13.969007	26.264721	25.823522
min	1.000000	18.000000	15.000000	1.000000
25%	50.750000	28.750000	41.500000	34.750000
50%	100.500000	36.000000	61.500000	50.000000
75%	150.250000	49.000000	78.000000	73.000000
max	200.000000	70.000000	137.000000	99.000000

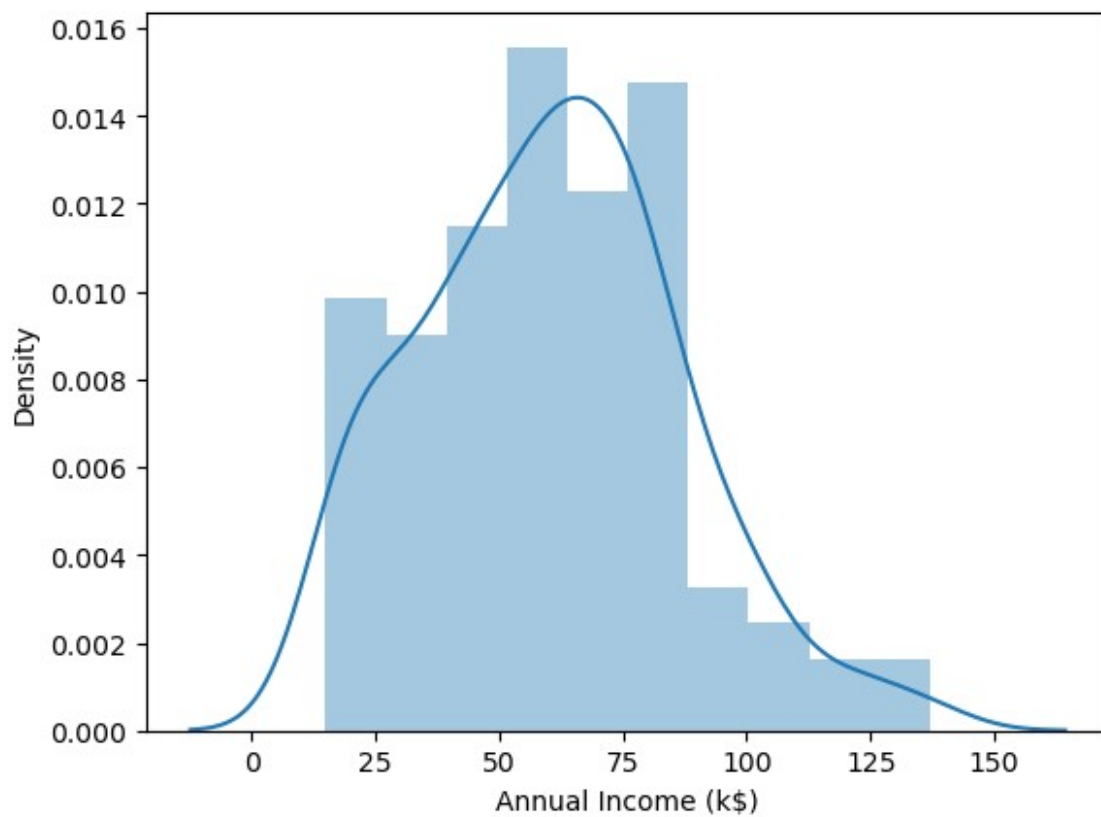
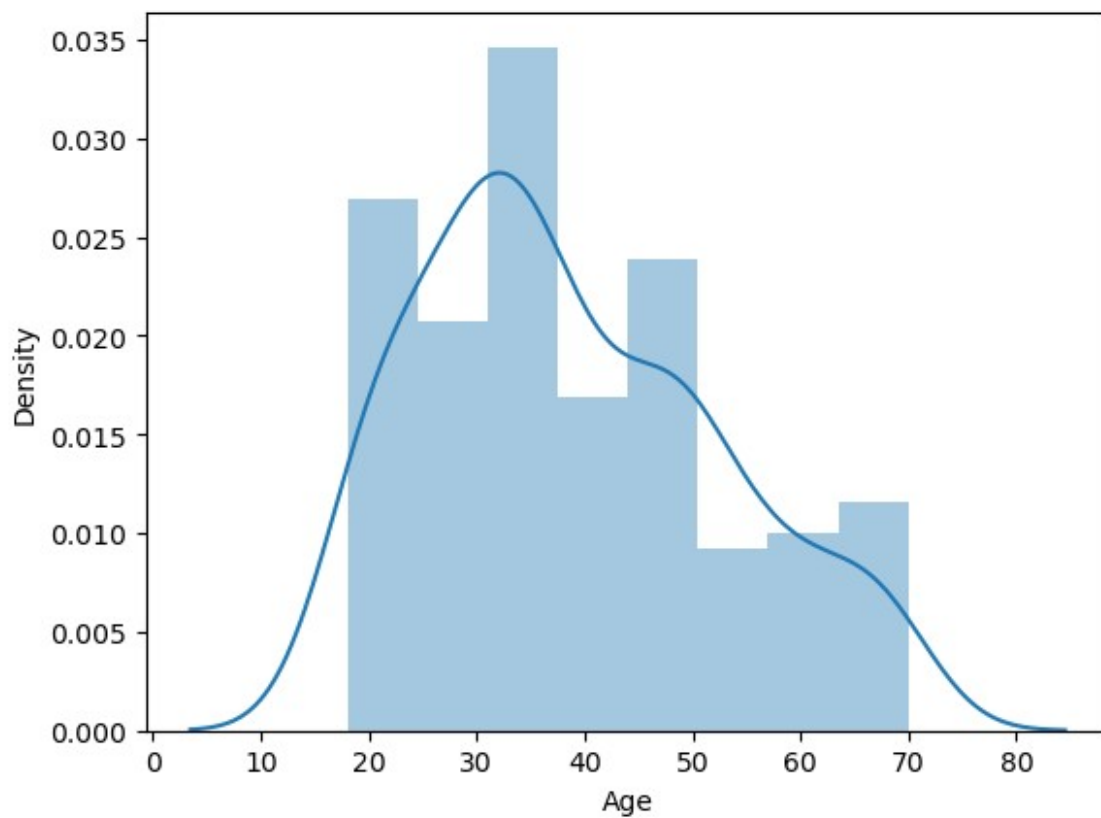
```
sns.distplot(df["Annual Income (k$)"])
```

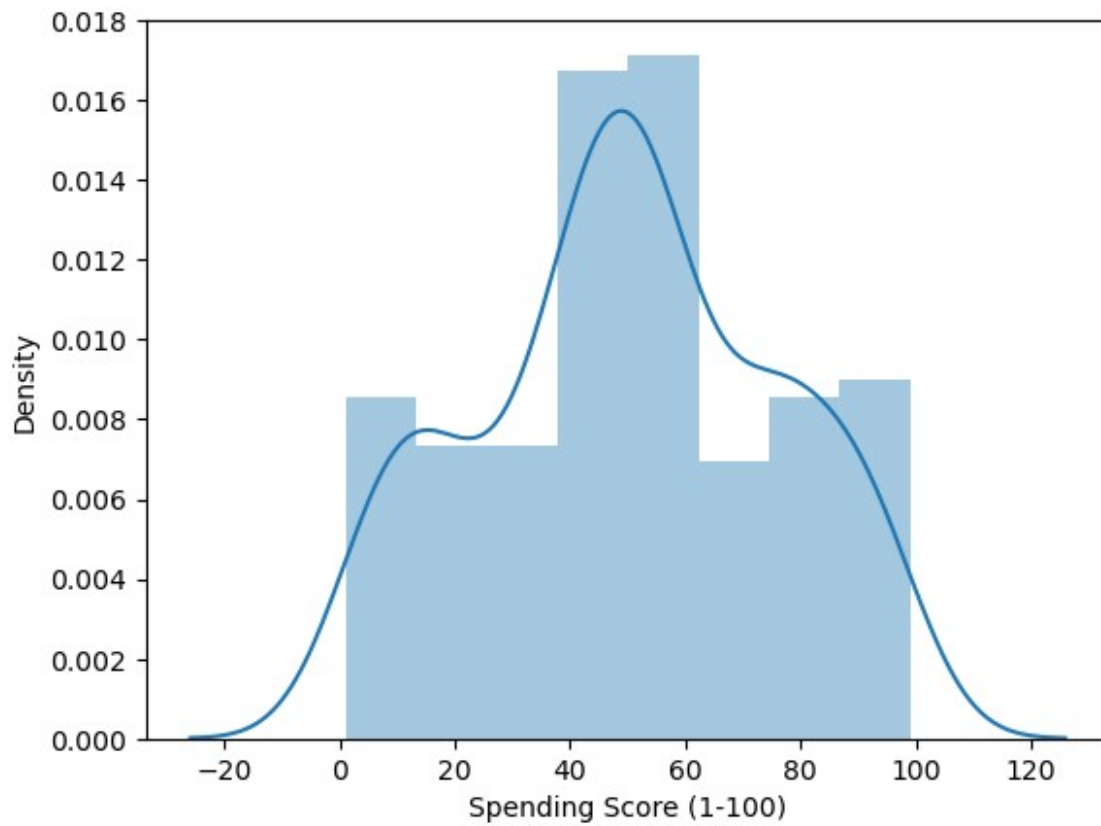
```
<Axes: xlabel='Annual Income (k$)', ylabel='Density'>
```



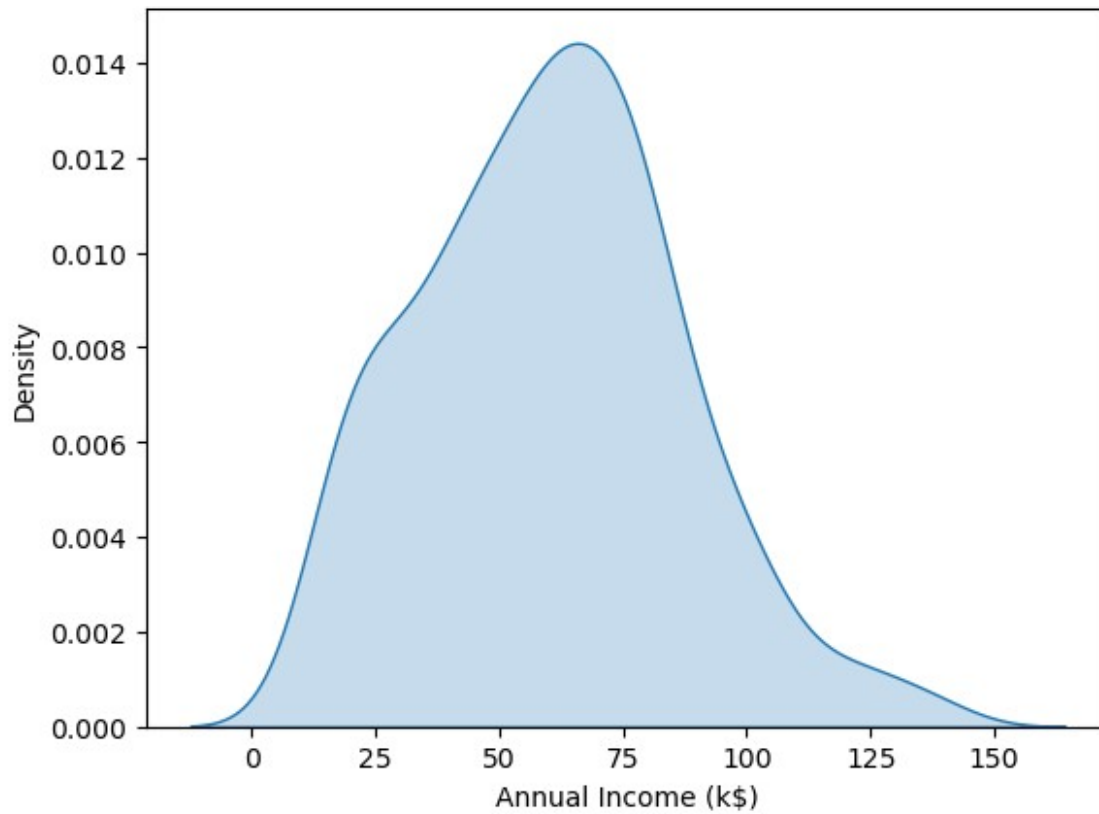
```
df.columns
Index(['CustomerID', 'Gender', 'Age', 'Annual Income (k$)',
      'Spending Score (1-100)'],
      dtype='object')

columns = ['Age', 'Annual Income (k$)', 'Spending Score (1-100)']
for i in columns:
    plt.figure()
    sns.distplot(df[i])
```

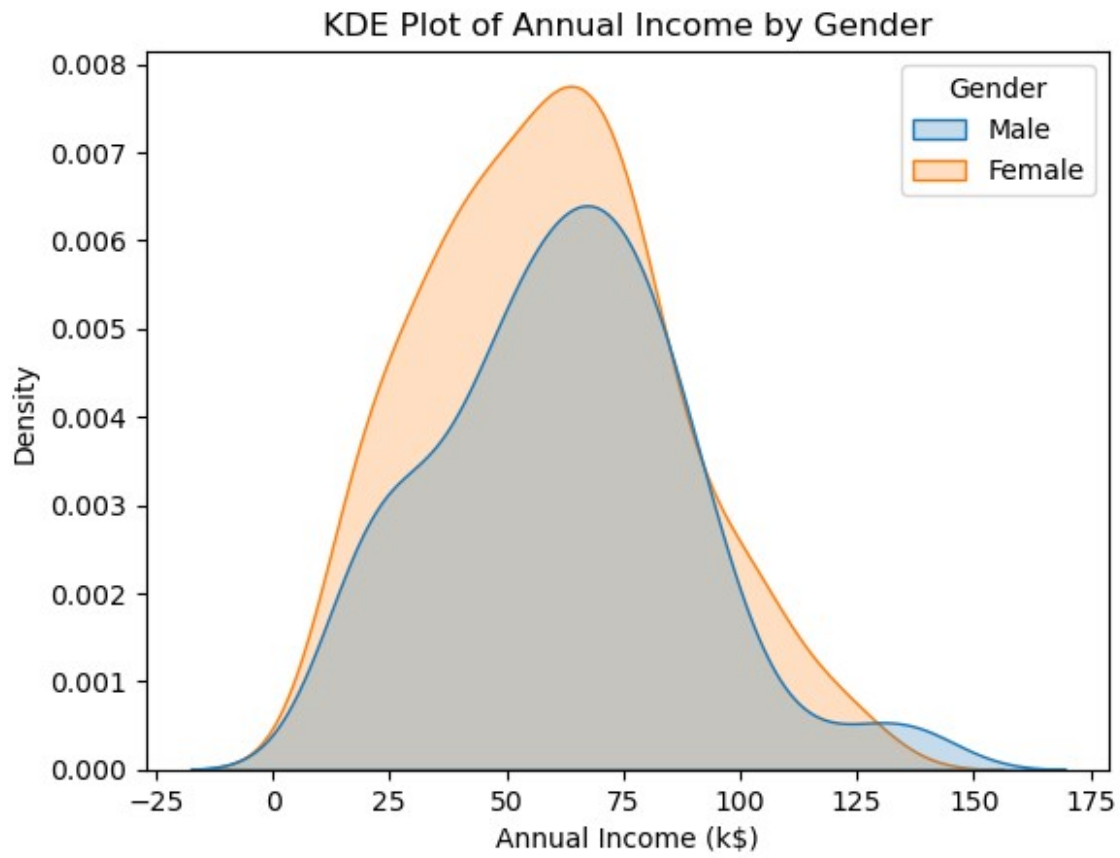




```
sns.kdeplot(df['Annual Income (k$)'], shade = True);
```

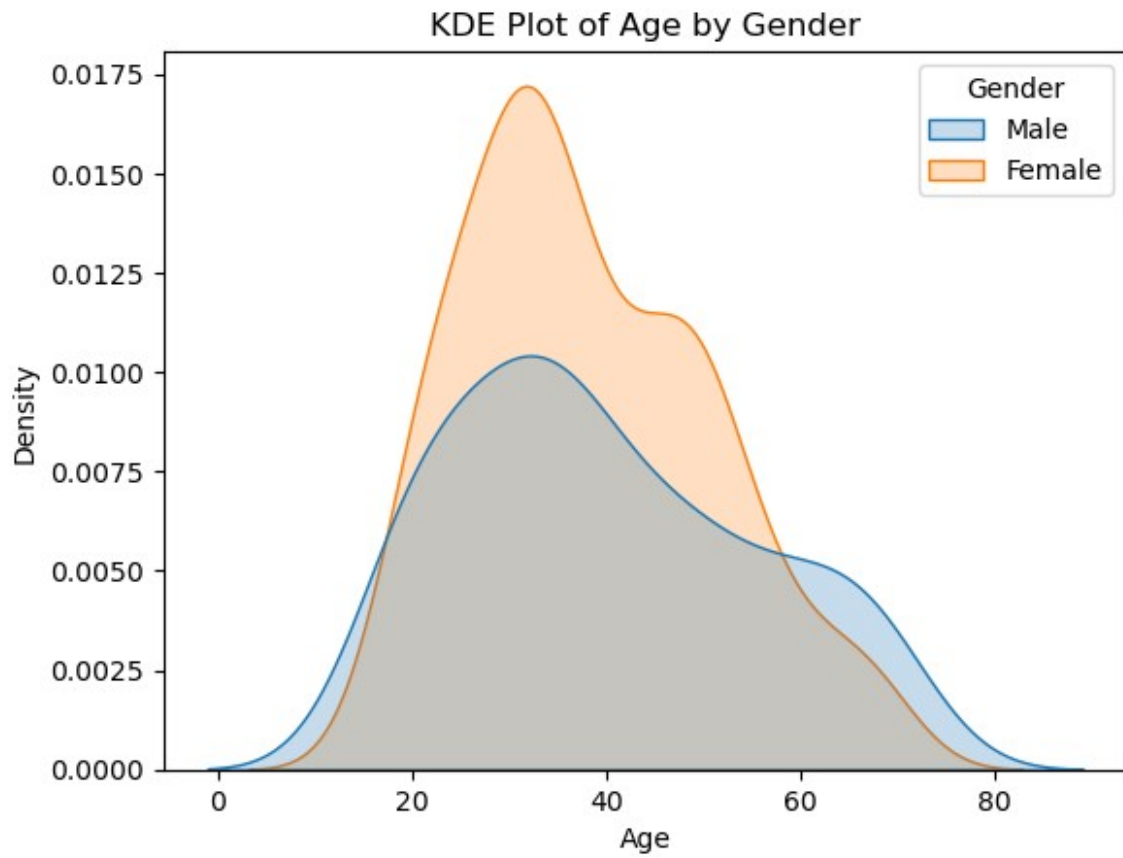


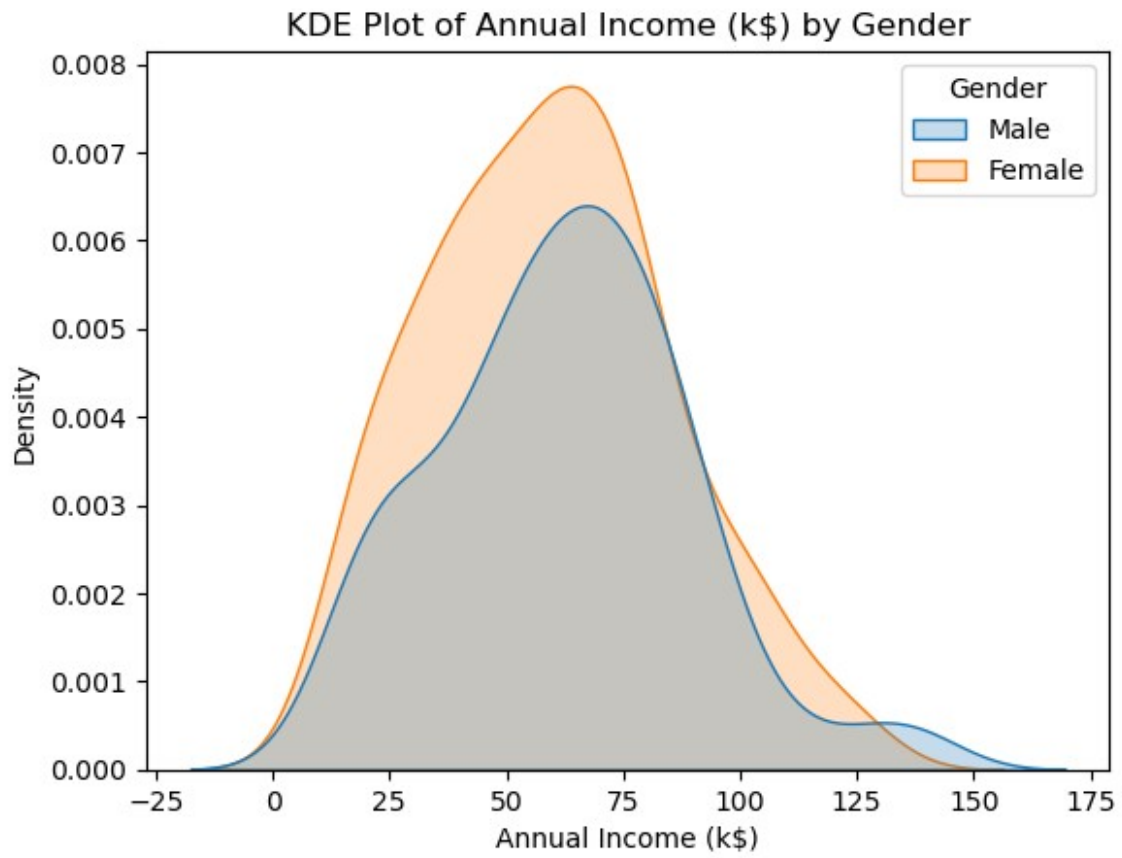
```
sns.kdeplot(data=df, x='Annual Income (k$)', shade=True, hue='Gender')  
plt.title('KDE Plot of Annual Income by Gender')  
plt.show()
```

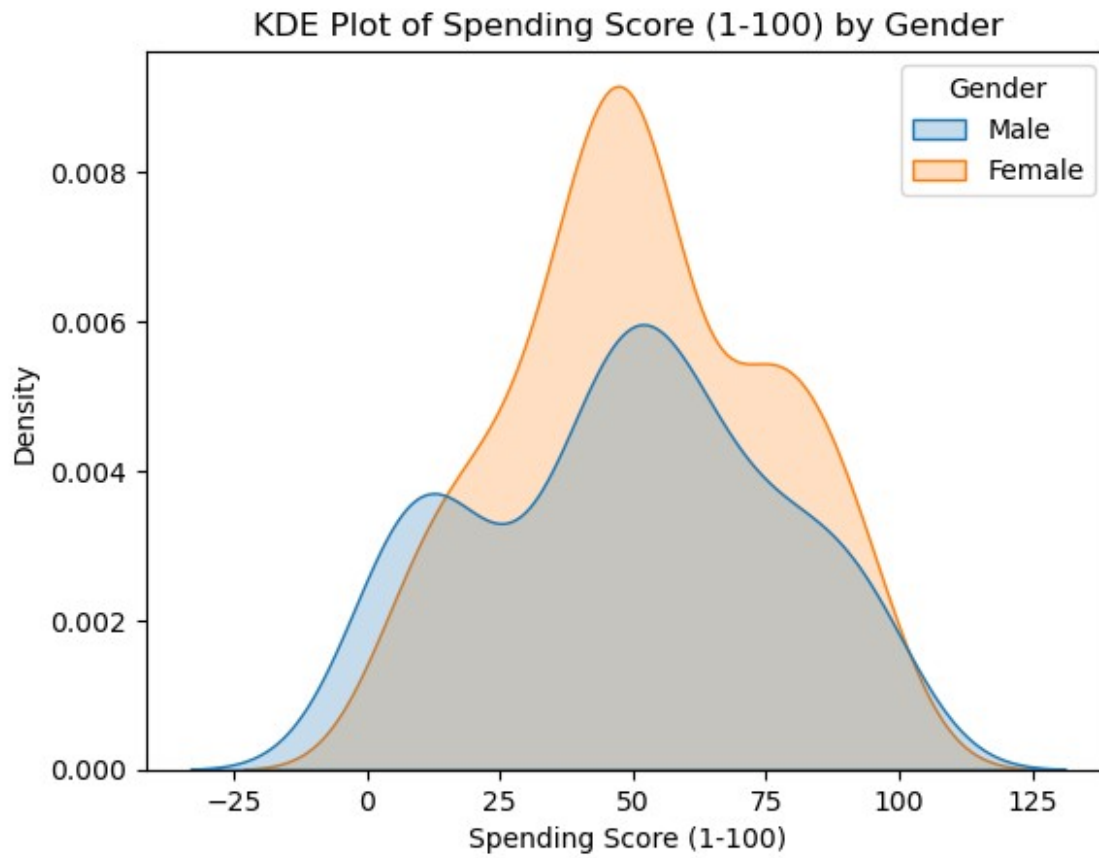


```
import matplotlib.pyplot as plt
import seaborn as sns

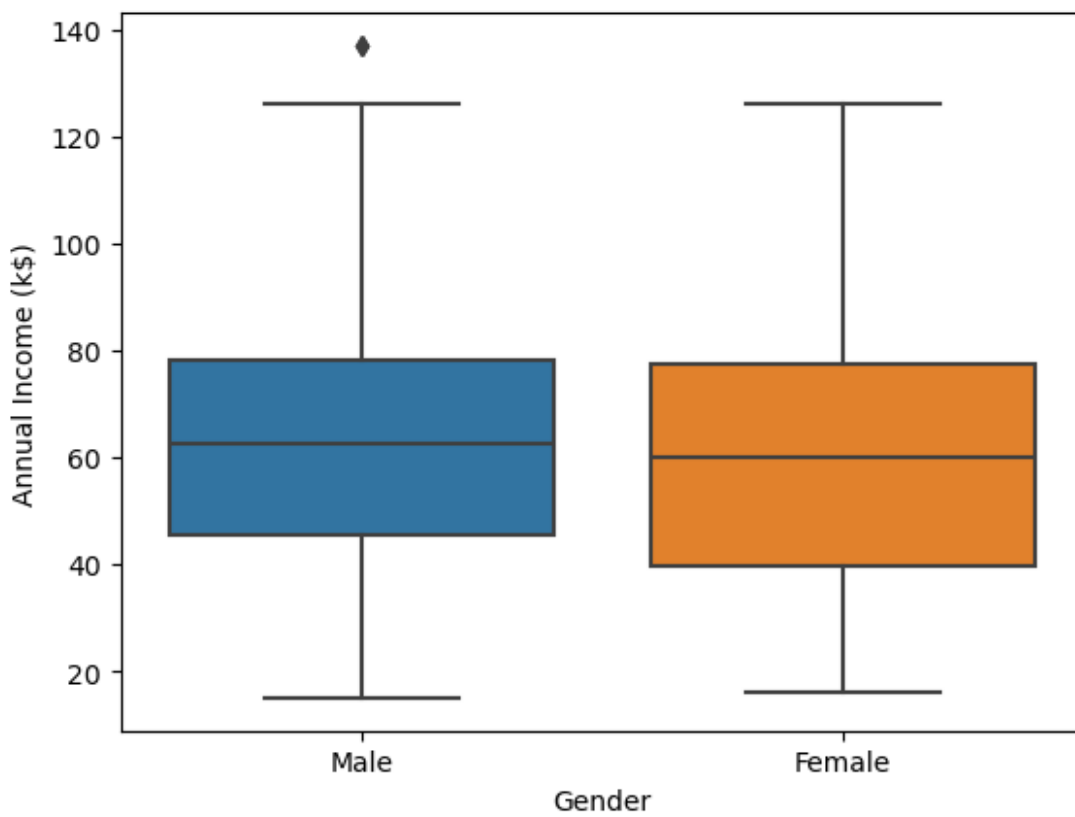
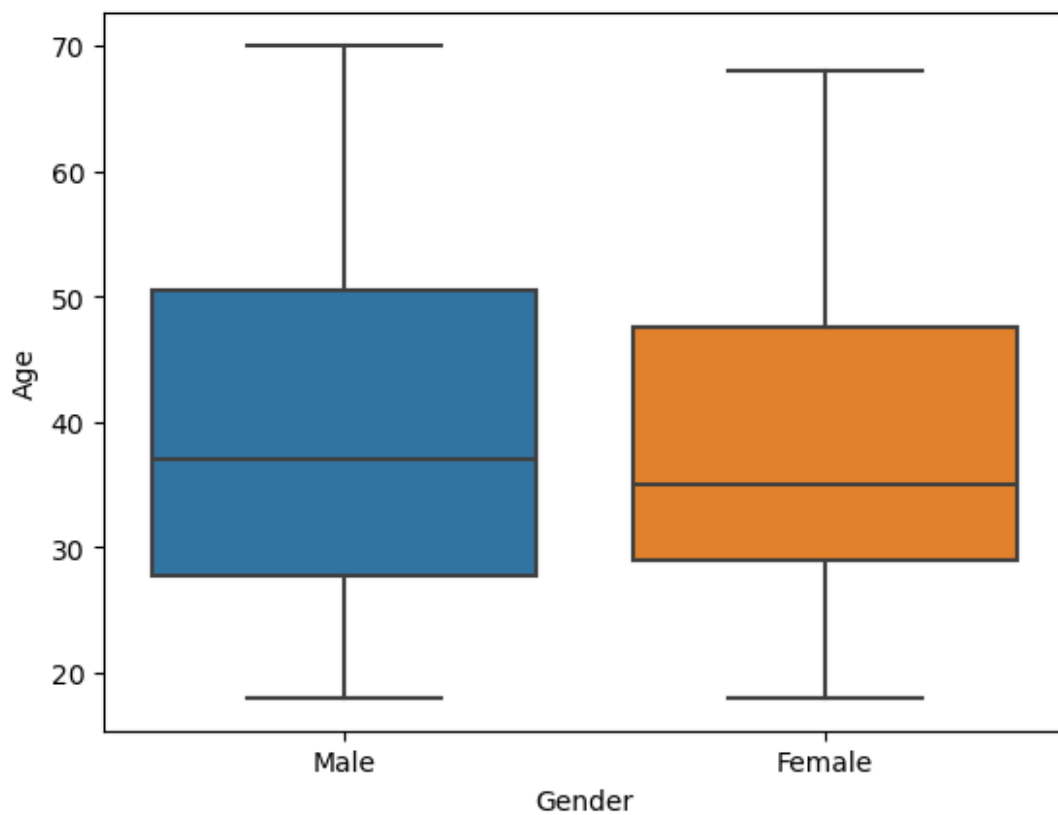
columns = ['Age', 'Annual Income (k$)', 'Spending Score (1-100)']
for i in columns:
    plt.figure()
    sns.kdeplot(data=df, x=i, shade=True, hue='Gender')
    plt.title(f'KDE Plot of {i} by Gender')
    plt.show()
```

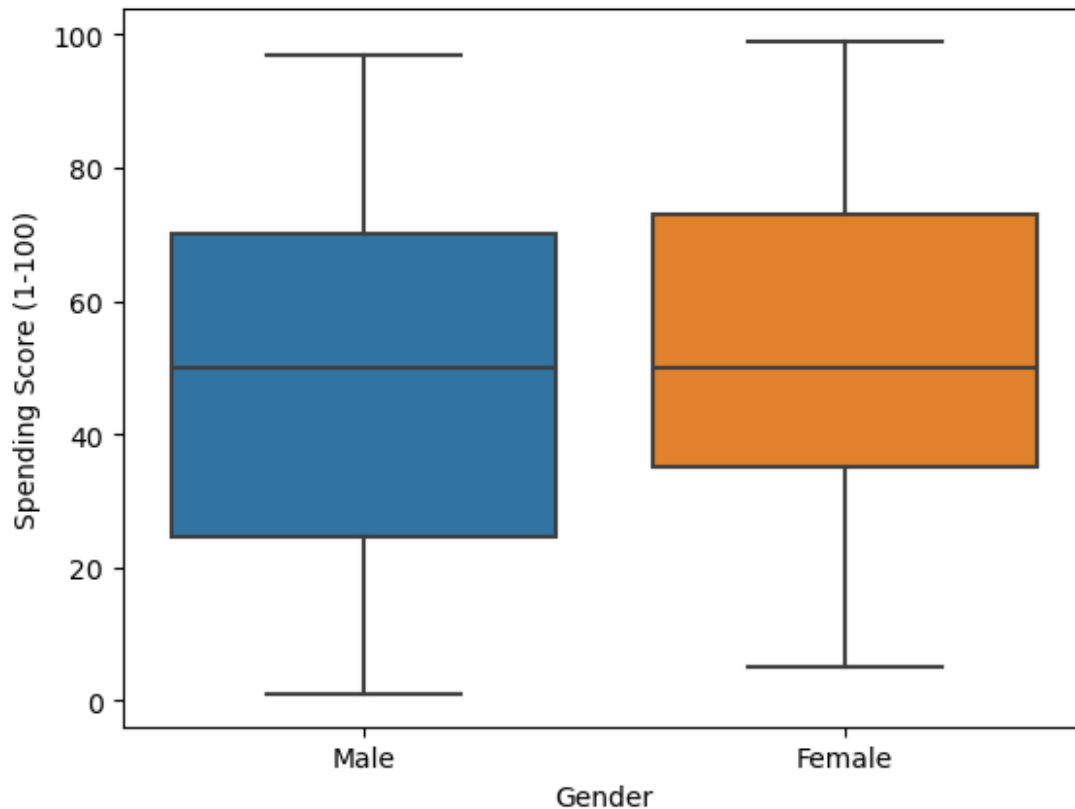






```
columns = ['Age', 'Annual Income (k$)', 'Spending Score (1-100)']  
for i in columns:  
    plt.figure()  
    sns.boxplot(data=df, x='Gender', y=df[i]);
```





```
df['Gender'].value_counts()

Gender
Female    112
Male       88
Name: count, dtype: int64

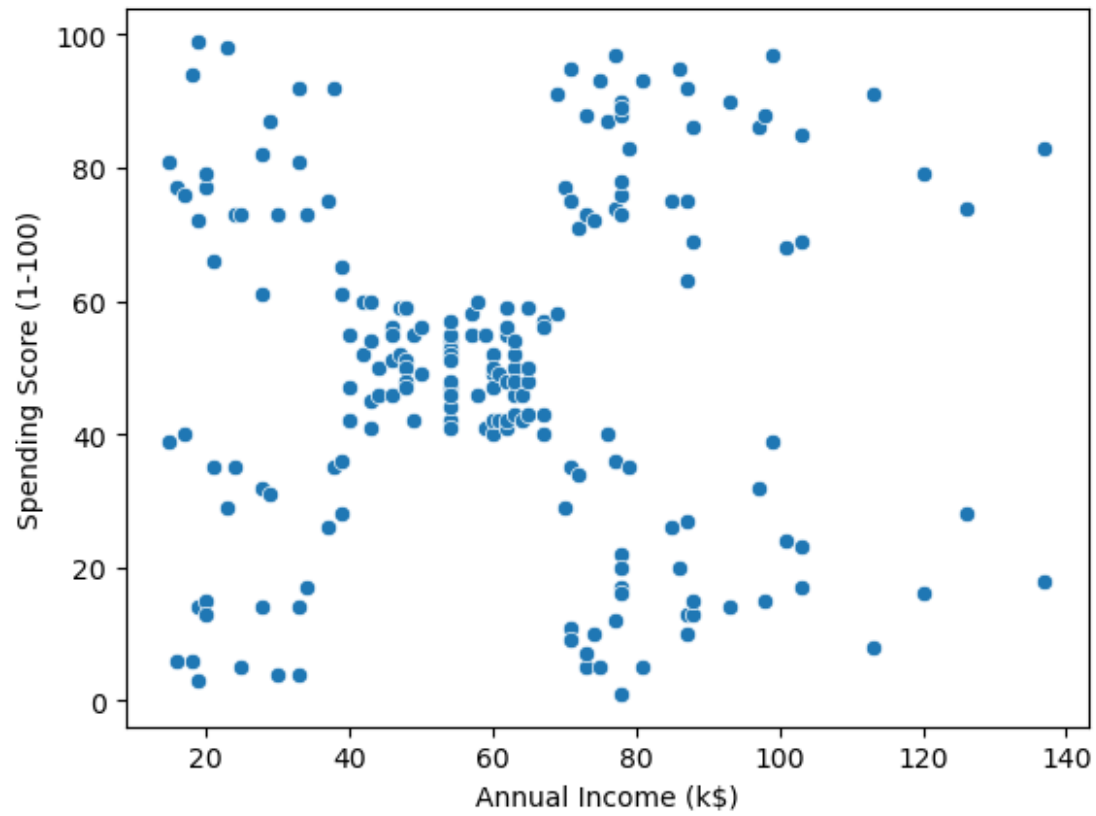
df['Gender'].value_counts(normalize=True)

Gender
Female    0.56
Male      0.44
Name: proportion, dtype: float64
```

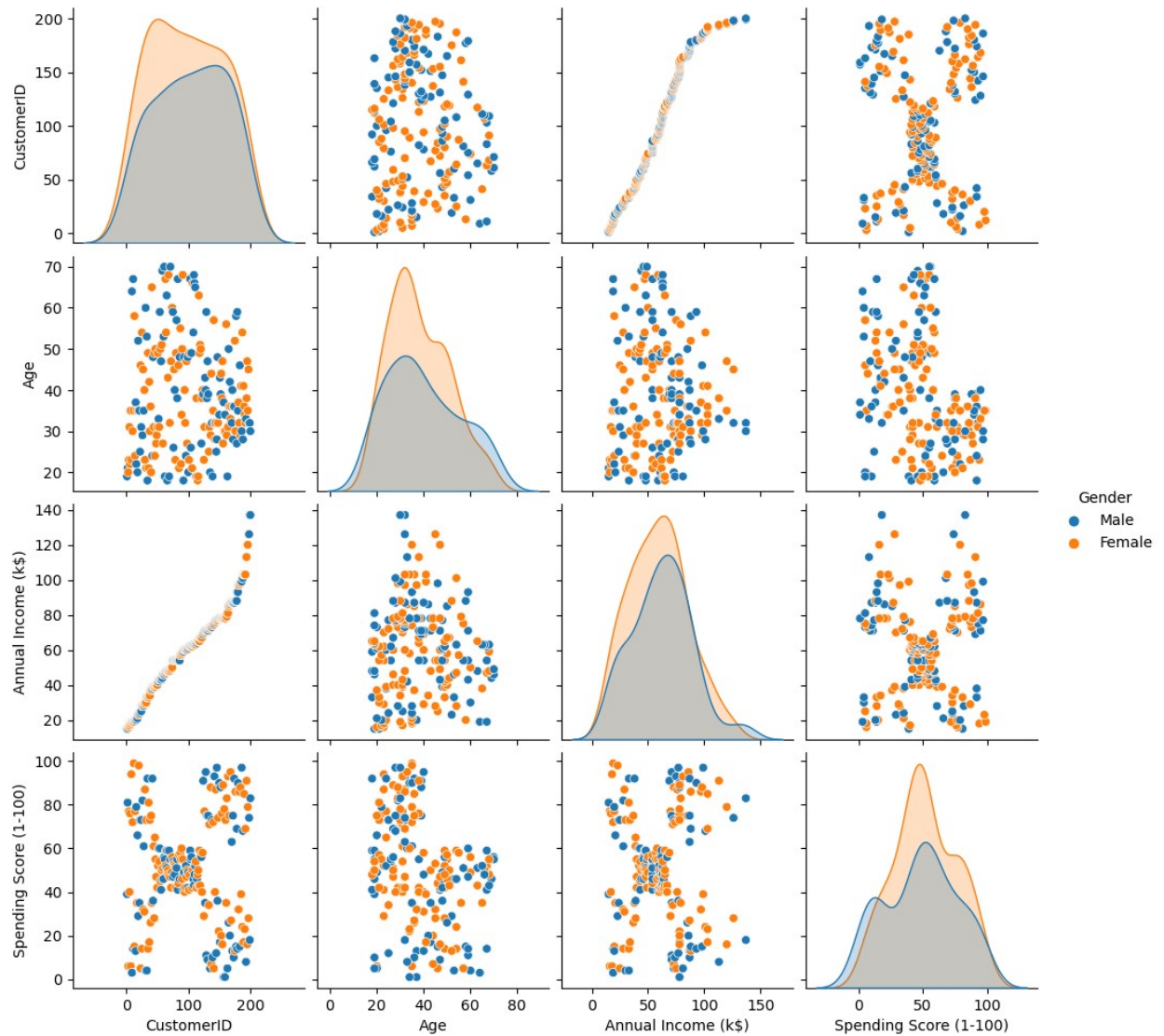
Bivariate Analysis

```
sns.scatterplot(data=df, x='Annual Income (k$)', y='Spending Score (1-100)')

<Axes: xlabel='Annual Income (k$)', ylabel='Spending Score (1-100)'>
```

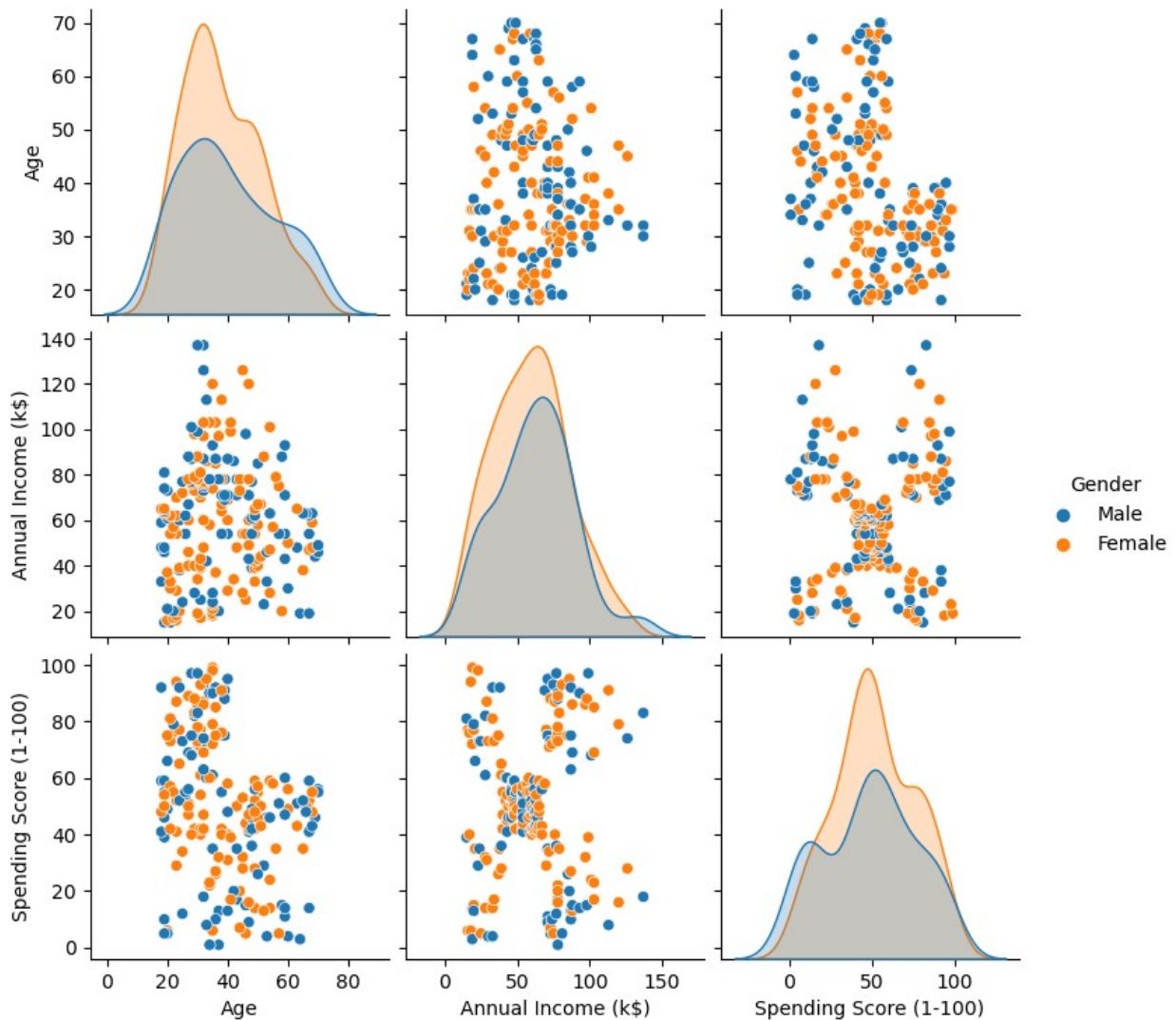


```
sns.pairplot(df, hue='Gender')  
<seaborn.axisgrid.PairGrid at 0x252278b2d10>
```



```
df = df.drop('CustomerID', axis=1)
sns.pairplot(df, hue='Gender')

<seaborn.axisgrid.PairGrid at 0x2522723a410>
```



```
df.groupby('Gender')[['Age', 'Annual Income (k$)', 'Spending Score (1-100)']].mean()
```

	Age	Annual Income (k\$)	Spending Score (1-100)
Gender			
Female	38.098214	59.250000	51.526786
Male	39.806818	62.227273	48.511364

```
# Select only numeric columns
```

```
numeric_df = df.select_dtypes(include=[float, int])
```

```
# Calculate the correlation matrix
```

```
correlation_matrix = numeric_df.corr()
```

```
# Display the correlation matrix
```

```
print(correlation_matrix)
```

	Age	Annual Income (k\$)	Spending Score
(1-100)			
Age	1.000000	-0.012398	-
0.327227			
Annual Income (k\$)	-0.012398	1.000000	
0.009903			
Spending Score (1-100)	-0.327227	0.009903	
1.000000			

```
print(correlation_matrix)
```

	Age	Annual Income (k\$)	Spending Score
(1-100)			
Age	1.000000	-0.012398	-
0.327227			
Annual Income (k\$)	-0.012398	1.000000	
0.009903			
Spending Score (1-100)	-0.327227	0.009903	
1.000000			

Clustering - Univariate, Bivariate, Multivariate

[illegible]

```

df['Income Cluster'] = clustering1.labels_
df.head()

```

	Gender	Age	Annual Income (k\$)	Spending Score (1-100)	Income Cluster
0	Male	19	15	39	1
1	Male	21	15	81	1
2	Female	20	16	6	1
3	Female	23	16	77	1
4	Female	31	17	40	1

```

df['Income Cluster'].value_counts()

```

Income Cluster	count
0	90
1	74
2	36

```

Name: count, dtype: int64

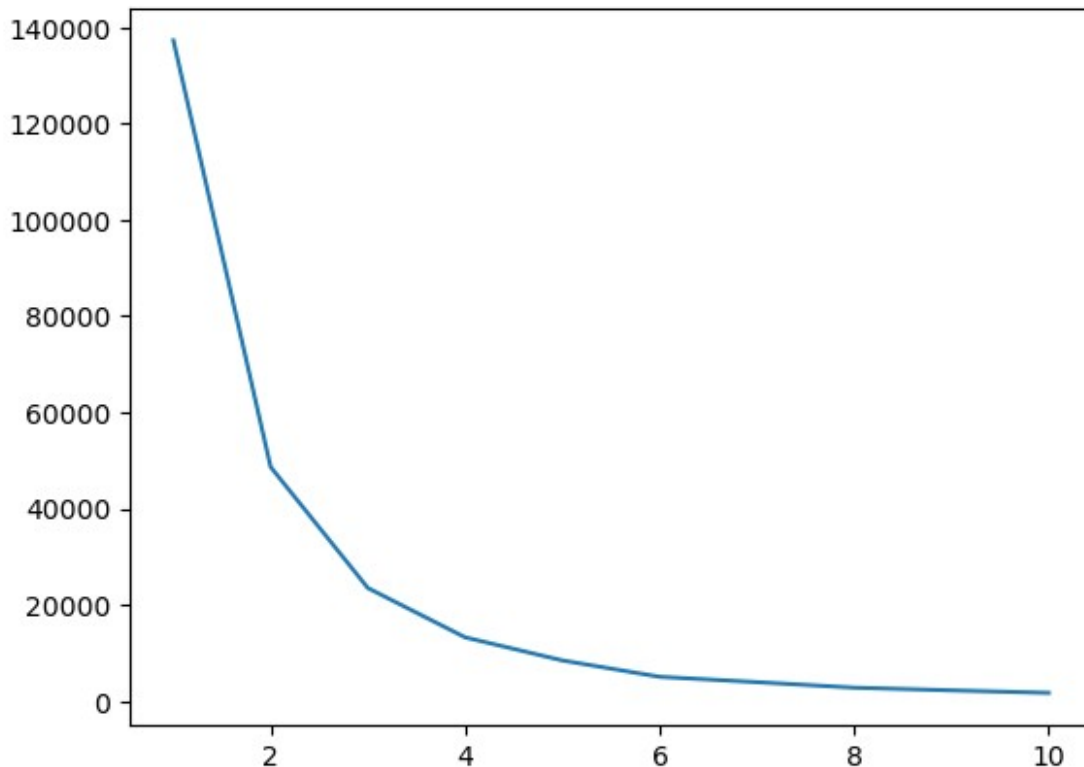
clustering1.inertia_
23517.330930930937

inertia_scores=[]
for i in range(1,11):
    kmeans=KMeans(n_clusters=i)
    kmeans.fit(df[['Annual Income (k$)']])
    inertia_scores.append(kmeans.inertia_)

inertia_scores
[137277.28,
 48660.88888888889,
 23517.330930930937,
 13278.112713472485,
 8481.496190476191,
 5081.48466026727,
 3976.358363858364,
 2827.308424908425,
 2269.356837606838,
 1743.4772727272727]

plt.plot(range(1,11), inertia_scores)
[<matplotlib.lines.Line2D at 0x25228fdc910>]

```

```
df.columns
```

```
Index(['Gender', 'Age', 'Annual Income (k$)', 'Spending Score (1-100)',
      'Income Cluster'],
      dtype='object')
```

```
df.groupby('Income Cluster')[['Age', 'Annual Income (k$)', 'Spending Score (1-100)']].mean()
```

	Age	Annual Income (k\$)	Spending Score (1-100)
Income Cluster			
0	38.722222	67.088889	50.000000
1	39.500000	33.486486	50.229730
2	37.833333	99.888889	50.638889

```
#Bivariate clustering
```

```
clustering2 = KMeans(n_clusters=5)
clustering2.fit(df[['Annual Income (k$)', 'Spending Score (1-100)']])
df['Spending and income cluster'] = clustering2.labels_
df.head()
```

	Gender	Age	Annual Income (k\$)	Spending Score (1-100)	Income Cluster
0	Male	19	15	39	

```

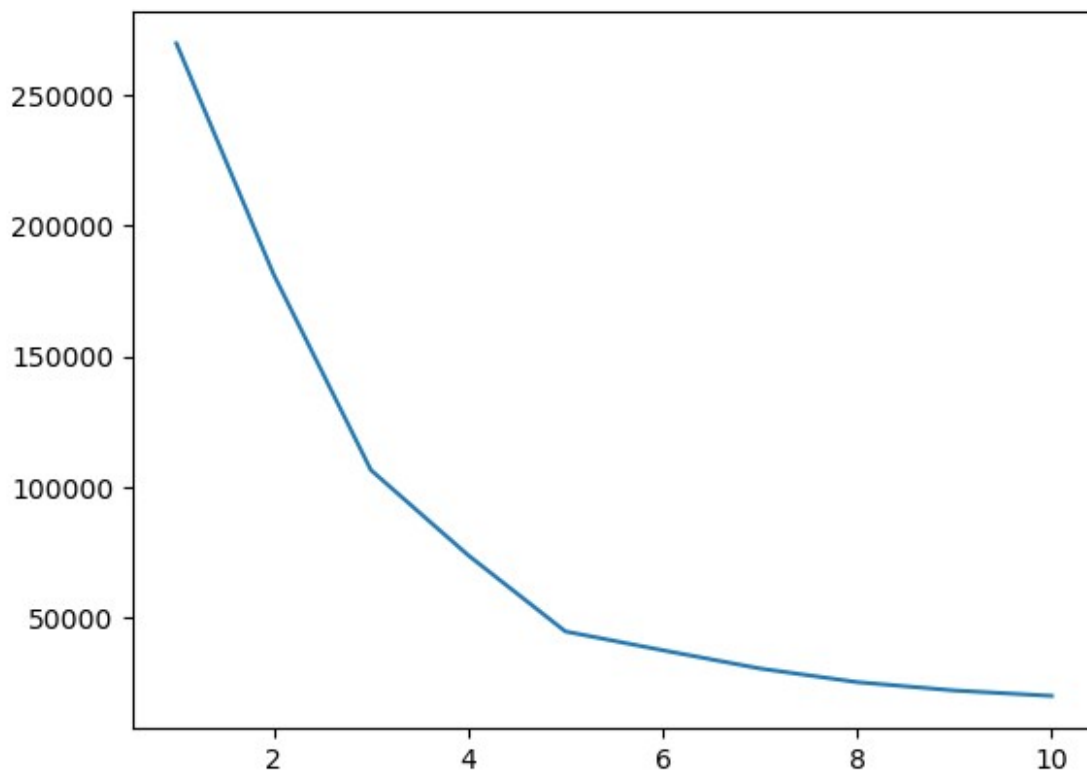
1
1 Male 21 15 81
1
2 Female 20 16 6
1
3 Female 23 16 77
1
4 Female 31 17 40
1

Spending and income cluster
0 4
1 3
2 4
3 3
4 4

inertia_scores2=[]
for i in range(1,11):
    kmeans2=KMeans(n_clusters=i)
    kmeans2.fit(df[['Annual Income (k$)', 'Spending Score (1-100)']])
    inertia_scores2.append(kmeans2.inertia_)
plt.plot(range(1,11),inertia_scores2)

[<matplotlib.lines.Line2D at 0x252290736d0>]

```

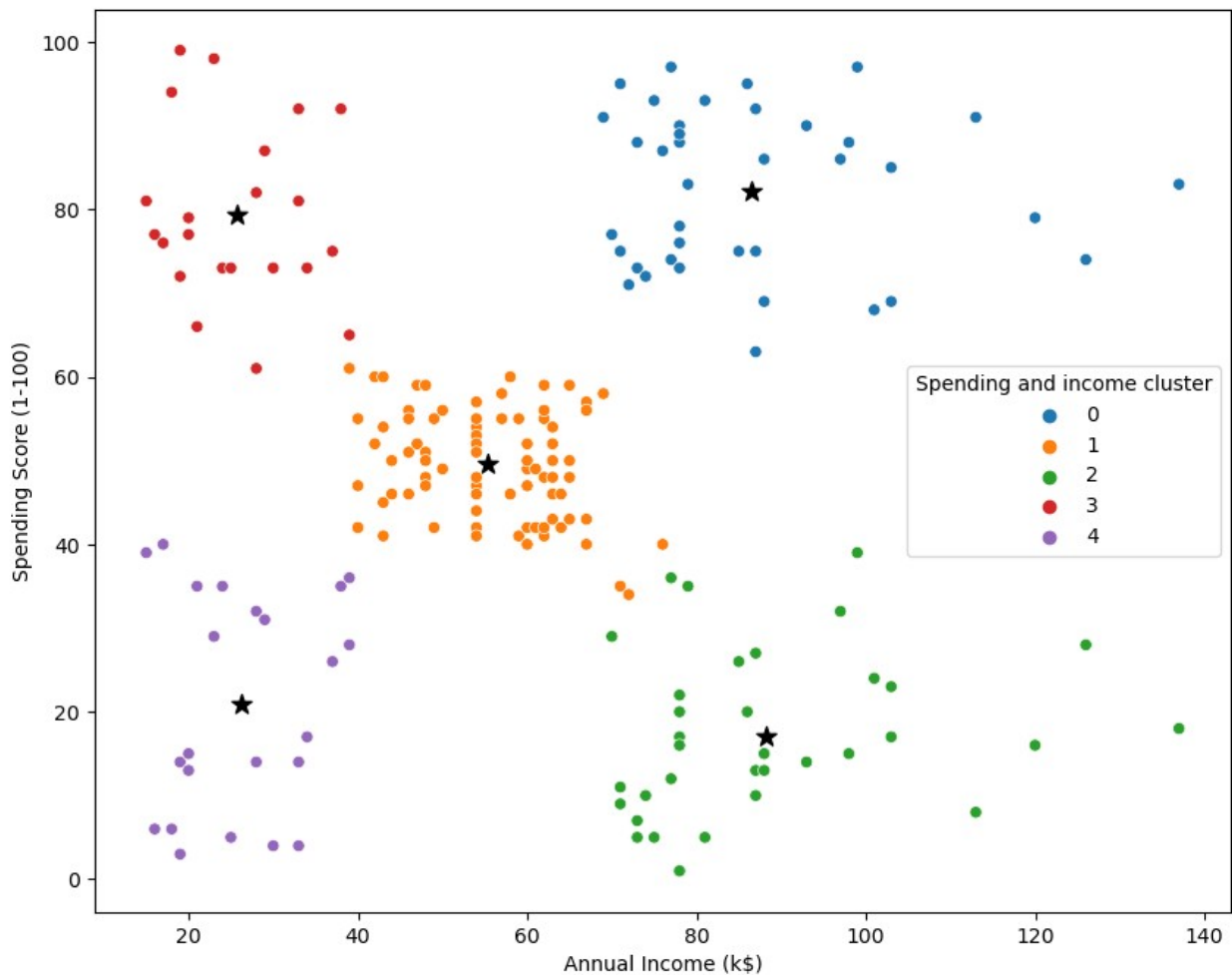


```

centers = pd.DataFrame(clustering2.cluster_centers_)
centers.columns = ['x', 'y']

plt.figure(figsize=(10,8))
plt.scatter(x=centers['x'], y=centers['y'], s=100, c='black',
marker='*')
sns.scatterplot(data=df, x='Annual Income (k$)', y= 'Spending Score
(1-100)', hue = 'Spending and income cluster', palette = 'tab10'
)
<Axes: xlabel='Annual Income (k$)', ylabel='Spending Score (1-100)'>

```



```

pd.crosstab(df['Spending and income cluster'], df['Gender'],
normalize= 'index')

```

Gender	Female	Male
Spending and income cluster		
0	0.538462	0.461538
1	0.592593	0.407407

2	0.457143	0.542857
3	0.590909	0.409091
4	0.608696	0.391304

```
df.groupby('Spending and income cluster')[['Age', 'Annual Income (k$)', 'Spending Score (1-100)']].mean()
```

Spending and income cluster	Age	Annual Income (k\$)	\
0	32.692308	86.538462	
1	42.716049	55.296296	
2	41.114286	88.200000	
3	25.272727	25.727273	
4	45.217391	26.304348	

Spending and income cluster	Spending Score (1-100)
0	82.128205
1	49.518519
2	17.114286
3	79.363636
4	20.913043

multivariate clustering

```
from sklearn.preprocessing import StandardScaler
```

```
scale = StandardScaler()
```

```
df.head()
```

	Gender	Age	Annual Income (k\$)	Spending Score (1-100)	Income
Cluster \					
0	Male	19	15	39	
1					
1	Male	21	15	81	
1					
2	Female	20	16	6	
1					
3	Female	23	16	77	
1					
4	Female	31	17	40	
1					

Spending and income cluster
0
1
2

```

3
4

dff = pd.get_dummies(df, drop_first=True)
dff['Gender_Male'] = dff['Gender_Male'].astype(int)
dff.head()

```

	Age	Annual Income (k\$)	Spending Score (1-100)	Income Cluster	\
0	19	15	39	1	
1	21	15	81	1	
2	20	16	6	1	
3	23	16	77	1	
4	31	17	40	1	

```

    Spending and income cluster  Gender_Male
0                               4             1
1                               3             1
2                               4             0
3                               3             0
4                               4             0

```

```

dff = scale.fit_transform(dff)

dff = pd.DataFrame(scale.fit_transform(dff))
dff.head()

```

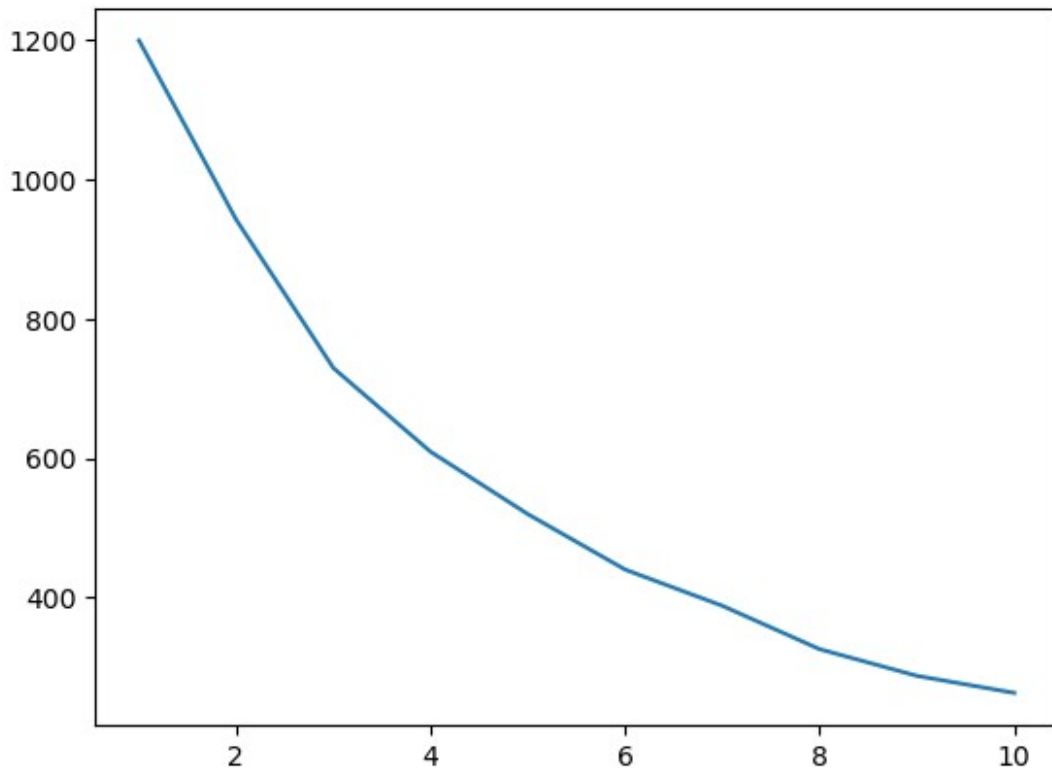
	0	1	2	3	4	5
0	-1.424569	-1.738999	-0.434801	0.361741	1.973193	1.128152
1	-1.281035	-1.738999	1.195704	0.361741	1.169448	1.128152
2	-1.352802	-1.700830	-1.715913	0.361741	1.973193	-0.886405
3	-1.137502	-1.700830	1.040418	0.361741	1.169448	-0.886405
4	-0.563369	-1.662660	-0.395980	0.361741	1.973193	-0.886405

```

inertia_scores3=[]
for i in range(1,11):
    kmeans3=KMeans(n_clusters=i)
    kmeans3.fit(dff)
    inertia_scores3.append(kmeans3.inertia_)
plt.plot(range(1,11),inertia_scores3)

[<matplotlib.lines.Line2D at 0x252296f8e10>]

```



df

	Gender	Age	Annual Income (k\$)	Spending Score (1-100)	Income
Cluster \					
0	Male	19	15	39	
1					
1	Male	21	15	81	
1					
2	Female	20	16	6	
1					
3	Female	23	16	77	
1					
4	Female	31	17	40	
1					
..
...					
195	Female	35	120	79	
2					
196	Female	45	126	28	
2					
197	Male	32	126	74	
2					
198	Male	32	137	18	
2					
199	Male	30	137	83	

2

	Spending and income cluster
0	4
1	3
2	4
3	3
4	4
..	...
195	0
196	2
197	0
198	2
199	0

[200 rows x 6 columns]

```
pip install -U notebook-as-pdf
```

Collecting notebook-as-pdfNote: you may need to restart the kernel to use updated packages.

Downloading notebook_as_pdf-0.5.0-py3-none-any.whl.metadata (2.4 kB)
Requirement already satisfied: nbconvert in c:\users\tushi\anaconda3\lib\site-packages (from notebook-as-pdf) (7.10.0)

Collecting pypeteer (from notebook-as-pdf)

Downloading pypeteer-2.0.0-py3-none-any.whl.metadata (7.1 kB)

Collecting PyPDF2 (from notebook-as-pdf)

Downloading pypdf2-3.0.1-py3-none-any.whl.metadata (6.8 kB)

Requirement already satisfied: beautifulsoup4 in c:\users\tushi\anaconda3\lib\site-packages (from nbconvert->notebook-as-pdf) (4.12.2)

Requirement already satisfied: bleach!=5.0.0 in c:\users\tushi\anaconda3\lib\site-packages (from nbconvert->notebook-as-pdf) (4.1.0)

Requirement already satisfied: defusedxml in c:\users\tushi\anaconda3\lib\site-packages (from nbconvert->notebook-as-pdf) (0.7.1)

Requirement already satisfied: jinja2>=3.0 in c:\users\tushi\anaconda3\lib\site-packages (from nbconvert->notebook-as-pdf) (3.1.3)

Requirement already satisfied: jupyter-core>=4.7 in c:\users\tushi\anaconda3\lib\site-packages (from nbconvert->notebook-as-pdf) (5.5.0)

Requirement already satisfied: jupyterlab-pygments in c:\users\tushi\anaconda3\lib\site-packages (from nbconvert->notebook-as-pdf) (0.1.2)

Requirement already satisfied: markupsafe>=2.0 in c:\users\tushi\anaconda3\lib\site-packages (from nbconvert->notebook-as-pdf) (2.1.3)

Requirement already satisfied: mistune<4,>=2.0.3 in c:\users\tushi\anaconda3\lib\site-packages (from nbconvert->notebook-as-pdf) (2.0.4)

Requirement already satisfied: nbclient>=0.5.0 in c:\users\tushi\anaconda3\lib\site-packages (from nbconvert->notebook-as-pdf) (0.8.0)

Requirement already satisfied: nbformat>=5.7 in c:\users\tushi\anaconda3\lib\site-packages (from nbconvert->notebook-as-pdf) (5.9.2)

Requirement already satisfied: packaging in c:\users\tushi\anaconda3\

```

lib\site-packages (from nbconvert->notebook-as-pdf) (23.1)
Requirement already satisfied: pandocfilters>=1.4.1 in c:\users\tushi\
anaconda3\lib\site-packages (from nbconvert->notebook-as-pdf) (1.5.0)
Requirement already satisfied: pygments>=2.4.1 in c:\users\tushi\
anaconda3\lib\site-packages (from nbconvert->notebook-as-pdf) (2.15.1)
Requirement already satisfied: tinycss2 in c:\users\tushi\anaconda3\
lib\site-packages (from nbconvert->notebook-as-pdf) (1.2.1)
Requirement already satisfied: traitlets>=5.1 in c:\users\tushi\
anaconda3\lib\site-packages (from nbconvert->notebook-as-pdf) (5.7.1)
Requirement already satisfied: appdirs<2.0.0,>=1.4.3 in c:\users\
tushi\anaconda3\lib\site-packages (from pyppeteer->notebook-as-pdf)
(1.4.4)
Requirement already satisfied: certifi>=2023 in c:\users\tushi\
anaconda3\lib\site-packages (from pyppeteer->notebook-as-pdf)
(2024.2.2)
Requirement already satisfied: importlib-metadata>=1.4 in c:\users\
tushi\anaconda3\lib\site-packages (from pyppeteer->notebook-as-pdf)
(7.0.1)
Collecting pyee<12.0.0,>=11.0.0 (from pyppeteer->notebook-as-pdf)
  Downloading pyee-11.1.0-py3-none-any.whl.metadata (2.8 kB)
Requirement already satisfied: tqdm<5.0.0,>=4.42.1 in c:\users\tushi\
anaconda3\lib\site-packages (from pyppeteer->notebook-as-pdf) (4.65.0)
Collecting urllib3<2.0.0,>=1.25.8 (from pyppeteer->notebook-as-pdf)
  Downloading urllib3-1.26.19-py2.py3-none-any.whl.metadata (49 kB)
----- 0.0/49.3 kB ? eta
-:--:--
----- 41.0/49.3 kB 991.0 kB/s
eta 0:00:01
----- 49.3/49.3 kB 831.5 kB/s
eta 0:00:00
Collecting websockets<11.0,>=10.0 (from pyppeteer->notebook-as-pdf)
  Downloading websockets-10.4-cp311-cp311-win_amd64.whl.metadata (6.4
kB)
Requirement already satisfied: six>=1.9.0 in c:\users\tushi\anaconda3\
lib\site-packages (from bleach!=5.0.0->nbconvert->notebook-as-pdf)
(1.16.0)
Requirement already satisfied: webencodings in c:\users\tushi\
anaconda3\lib\site-packages (from bleach!=5.0.0->nbconvert->notebook-
as-pdf) (0.5.1)
Requirement already satisfied: zipp>=0.5 in c:\users\tushi\anaconda3\
lib\site-packages (from importlib-metadata>=1.4->pyppeteer->notebook-
as-pdf) (3.17.0)
Requirement already satisfied: platformdirs>=2.5 in c:\users\tushi\
anaconda3\lib\site-packages (from jupyter-core>=4.7->nbconvert-
>notebook-as-pdf) (3.10.0)
Requirement already satisfied: pywin32>=300 in c:\users\tushi\
anaconda3\lib\site-packages (from jupyter-core>=4.7->nbconvert-
>notebook-as-pdf) (305.1)
Requirement already satisfied: jupyter-client>=6.1.12 in c:\users\

```



```

tushi\anaconda3\lib\site-packages (from nbclient>=0.5.0->nbconvert-
>notebook-as-pdf) (8.6.0)
Requirement already satisfied: fastjsonschema in c:\users\tushi\
anaconda3\lib\site-packages (from nbformat>=5.7->nbconvert->notebook-
as-pdf) (2.16.2)
Requirement already satisfied: jsonschema>=2.6 in c:\users\tushi\
anaconda3\lib\site-packages (from nbformat>=5.7->nbconvert->notebook-
as-pdf) (4.19.2)
Requirement already satisfied: typing-extensions in c:\users\tushi\
anaconda3\lib\site-packages (from pyee<12.0.0,>=11.0.0->pypeteer-
>notebook-as-pdf) (4.9.0)
Requirement already satisfied: colorama in c:\users\tushi\anaconda3\
lib\site-packages (from tqdm<5.0.0,>=4.42.1->pypeteer->notebook-as-
pdf) (0.4.6)
Requirement already satisfied: soupsieve>1.2 in c:\users\tushi\
anaconda3\lib\site-packages (from beautifulsoup4->nbconvert->notebook-
as-pdf) (2.5)
Requirement already satisfied: attrs>=22.2.0 in c:\users\tushi\
anaconda3\lib\site-packages (from jsonschema>=2.6->nbformat>=5.7-
>nbconvert->notebook-as-pdf) (23.1.0)
Requirement already satisfied: jsonschema-specifications>=2023.03.6 in
c:\users\tushi\anaconda3\lib\site-packages (from jsonschema>=2.6-
>nbformat>=5.7->nbconvert->notebook-as-pdf) (2023.7.1)
Requirement already satisfied: referencing>=0.28.4 in c:\users\tushi\
anaconda3\lib\site-packages (from jsonschema>=2.6->nbformat>=5.7-
>nbconvert->notebook-as-pdf) (0.30.2)
Requirement already satisfied: rpds-py>=0.7.1 in c:\users\tushi\
anaconda3\lib\site-packages (from jsonschema>=2.6->nbformat>=5.7-
>nbconvert->notebook-as-pdf) (0.10.6)
Requirement already satisfied: python-dateutil>=2.8.2 in c:\users\
tushi\anaconda3\lib\site-packages (from jupyter-client>=6.1.12-
>nbclient>=0.5.0->nbconvert->notebook-as-pdf) (2.8.2)
Requirement already satisfied: pyzmq>=23.0 in c:\users\tushi\
anaconda3\lib\site-packages (from jupyter-client>=6.1.12-
>nbclient>=0.5.0->nbconvert->notebook-as-pdf) (25.1.2)
Requirement already satisfied: tornado>=6.2 in c:\users\tushi\
anaconda3\lib\site-packages (from jupyter-client>=6.1.12-
>nbclient>=0.5.0->nbconvert->notebook-as-pdf) (6.3.3)
Downloading notebook_as_pdf-0.5.0-py3-none-any.whl (6.5 kB)
Downloading pypdf2-3.0.1-py3-none-any.whl (232 kB)
----- 0.0/232.6 kB ? eta -:-:-
----- 232.6/232.6 kB 14.8 MB/s
eta 0:00:00
Downloading pypeteer-2.0.0-py3-none-any.whl (82 kB)
----- 0.0/82.9 kB ? eta -:-:-
----- 82.9/82.9 kB ? eta 0:00:00
Downloading pyee-11.1.0-py3-none-any.whl (15 kB)
Downloading urllib3-1.26.19-py2.py3-none-any.whl (143 kB)
----- 0.0/143.9 kB ? eta -:-:-

```

```

----- 143.9/143.9 kB 8.9 MB/s
eta 0:00:00
Downloading websockets-10.4-cp311-cp311-win_amd64.whl (101 kB)
----- 0.0/101.4 kB ? eta -:--:--
----- 101.4/101.4 kB 5.7 MB/s
eta 0:00:00
Installing collected packages: websockets, urllib3, PyPDF2, pyee,
pypeteer, notebook-as-pdf
  Attempting uninstall: urllib3
    Found existing installation: urllib3 2.0.7
    Uninstalling urllib3-2.0.7:
      Successfully uninstalled urllib3-2.0.7
Successfully installed PyPDF2-3.0.1 notebook-as-pdf-0.5.0 pyee-11.1.0
pypeteer-2.0.0 urllib3-1.26.19 websockets-10.4

conda install -c conda-forge pandoc

```

```

-----
-----
error                                Traceback (most recent call
last)
Cell In[6], line 1
----> 1 get_ipython().run_line_magic('conda', 'install -c conda-forge
pandoc')

```

```

File ~\anaconda3\Lib\site-packages\IPython\core\
interactiveshell.py:2456, in InteractiveShell.run_line_magic(self,
magic_name, line, _stack_depth)
    2454     kwargs['local_ns'] = self.get_local_scope(stack_depth)
    2455     with self.builtin_trap:
-> 2456         result = fn(*args, **kwargs)
    2458 # The code below prevents the output from being displayed
    2459 # when using magics with decorator @output_can_be_silenced
    2460 # when the last Python token in the expression is a ';'.
    2461 if getattr(fn, magic.MAGIC_OUTPUT_CAN_BE_SILENCED, False):

```

```

File ~\anaconda3\Lib\site-packages\IPython\core\magics\
packaging.py:30, in is_conda_environment.<locals>.wrapper(*args,
**kwargs)
    25 if not Path(sys.prefix, "conda-meta", "history").exists():
    26     raise ValueError(
    27         "The python kernel does not appear to be a conda
environment. "
    28         "Please use ``%pip install`` instead."
    29     )
----> 30 return func(*args, **kwargs)

```

```

File ~\anaconda3\Lib\site-packages\IPython\core\magics\
packaging.py:128, in PackagingMagics.conda(self, line)
    120 @line_magic

```

```

121 @is_conda_environment
122 def conda(self, line):
123     """Run the conda package manager within the current
kernel.
124
125     Usage:
126         %conda install [pkgs]
127     """
--> 128     conda = _get_conda_like_executable("conda")
129     self._run_command(conda, line)

```

File ~\anaconda3\Lib\site-packages\IPython\core\magics\packaging.py:53, in _get_conda_like_executable(command)
50 # Otherwise, attempt to extract the executable from conda history.

```

51 # This applies in any conda environment.
52 history = Path(sys.prefix, "conda-meta",
"history").read_text(encoding="utf-8")
--> 53 match = re.search(
54     rf"^\s*cmd:\s*(?P<command>.*{executable})\s[create|
install]",
55     history,
56     flags=re.MULTILINE,
57 )
58 if match:
59     return match.groupdict()["command"]

```

File ~\anaconda3\Lib\re__init__.py:176, in search(pattern, string, flags)

```

173 def search(pattern, string, flags=0):
174     """Scan through string looking for a match to the pattern,
returning
175     a Match object, or None if no match was found."""
--> 176     return _compile(pattern, flags).search(string)

```

File ~\anaconda3\Lib\re__init__.py:294, in _compile(pattern, flags)

```

288 import warnings
289 warnings.warn("The re.TEMPLATE/re.T flag is deprecated "
290              "as it is an undocumented flag "
291              "without an obvious purpose. "
292              "Don't use it.",
293              DeprecationWarning)
--> 294 p = _compiler.compile(pattern, flags)
295 if not (flags & DEBUG):
296     if len(_cache) >= _MAXCACHE:
297         # Drop the oldest item

```

File ~\anaconda3\Lib\re_compiler.py:745, in compile(p, flags)

```

743 if isinstance(p):
744     pattern = p

```

```
--> 745     p = _parser.parse(p, flags)
746 else:
747     pattern = None
```

File ~\anaconda3\Lib\re_parser.py:989, in parse(str, flags, state)

```
986 state.flags = flags
987 state.str = str
--> 989 p = _parse_sub(source, state, flags & SRE_FLAG_VERBOSE, 0)
990 p.state.flags = fix_flags(str, p.state.flags)
992 if source.next is not None:
```

File ~\anaconda3\Lib\re_parser.py:464, in _parse_sub(source, state, verbose, nested)

```
462 start = source.tell()
463 while True:
--> 464     itemsappend(_parse(source, state, verbose, nested + 1,
465                       not nested and not items))
466     if not sourcematch("|"):
467         break
```

File ~\anaconda3\Lib\re_parser.py:872, in _parse(source, state, verbose, nested, first)

```
869     group = None
870 sub_verbose = ((verbose or (add_flags & SRE_FLAG_VERBOSE)) and
871               not (del_flags & SRE_FLAG_VERBOSE))
--> 872 p = _parse_sub(source, state, sub_verbose, nested + 1)
873 if not source.match(")"):
874     raise source.error("missing ), unterminated subpattern",
875                       source.tell() - start)
```

File ~\anaconda3\Lib\re_parser.py:464, in _parse_sub(source, state, verbose, nested)

```
462 start = source.tell()
463 while True:
--> 464     itemsappend(_parse(source, state, verbose, nested + 1,
465                       not nested and not items))
466     if not sourcematch("|"):
467         break
```

File ~\anaconda3\Lib\re_parser.py:548, in _parse(source, state, verbose, nested, first)

```
545     continue
547 if this[0] == "\\":
--> 548     code = _escape(source, this, state)
549     subpatternappend(code)
551 elif this not in SPECIAL_CHARS:
```

File ~\anaconda3\Lib\re_parser.py:402, in _escape(source, escape, state)

```
400 escape += source.getwhile(8, HEXDIGITS)
```

```

    401 if len(escape) != 10:
--> 402     raise source.error("incomplete escape %s" % escape,
len(escape))
    403 c = int(escape[2:], 16)
    404 chr(c) # raise ValueError for invalid code

```

error: incomplete escape \U at position 28

pip install pandoc

Collecting pandoc

 Downloading pandoc-2.3.tar.gz (33 kB)

 Preparing metadata (setup.py): started

 Preparing metadata (setup.py): finished with status 'done'

Collecting plumbum (from pandoc)

 Downloading plumbum-1.8.3-py3-none-any.whl.metadata (10 kB)

Requirement already satisfied: ply in c:\users\tushi\anaconda3\lib\site-packages (from pandoc) (3.11)

Requirement already satisfied: pywin32 in c:\users\tushi\anaconda3\lib\site-packages (from plumbum->pandoc) (305.1)

Downloading plumbum-1.8.3-py3-none-any.whl (127 kB)

----- 0.0/127.6 kB ? eta -:-:-:-

----- 122.9/127.6 kB 3.6 MB/s

eta 0:00:01

----- 127.6/127.6 kB 2.5 MB/s

eta 0:00:00

Building wheels for collected packages: pandoc

 Building wheel for pandoc (setup.py): started

 Building wheel for pandoc (setup.py): finished with status 'done'

 Created wheel for pandoc: filename=pandoc-2.3-py3-none-any.whl size=33286 sha256=a570c51762fe9a94e7cdbl1d158299b7ce7a9591b91d387ab0973876416e783d2

 Stored in directory: c:\users\tushi\appdata\local\pip\cache\wheels\1c\9a\c4\6254542c4e8202d52fcd69798d2507aaad1f2a4bb60f2f0fea

Successfully built pandoc

Installing collected packages: plumbum, pandoc

Successfully installed pandoc-2.3 plumbum-1.8.3

Note: you may need to restart the kernel to use updated packages.