ASSIGNMENT-2

NAME : SOUMIK SAHA
REG NO:21BCE7048
MAIL ID :soumik.21bce7048@vitapstudent.ac.in
SLOT: MORNING
CAMPUS :VIT-AP

IMPORT SEABORN

In [1]:
```python
import seaborn as sns
import matplotlib.pyplot as plt
```

In [2]:
```python
dset=sns.load_dataset("car_crashes")
dset
```

Out[2]:

	total	speeding	alcohol	not_distracted	no_previous	ins_premium	ins_losses	abbrev
0	18.8	7.332	5.640	18.048	15.040	784.55	145.08	AL
1	18.1	7.421	4.525	16.290	17.014	1053.48	133.93	AK
2	18.6	6.510	5.208	15.624	17.856	899.47	110.35	AZ
3	22.4	4.032	5.824	21.056	21.280	827.34	142.39	AR
4	12.0	4.200	3.360	10.920	10.680	878.41	165.63	CA
5	13.6	5.032	3.808	10.744	12.920	835.50	139.91	CO
6	10.8	4.968	3.888	9.396	8.856	1068.73	167.02	CT
7	16.2	6.156	4.860	14.094	16.038	1137.87	151.48	DE
8	5.9	2.006	1.593	5.900	5.900	1273.89	136.05	DC
9	17.9	3.759	5.191	16.468	16.826	1160.13	144.18	FL
10	15.6	2.964	3.900	14.820	14.508	913.15	142.80	GA
11	17.5	9.450	7.175	14.350	15.225	861.18	120.92	HI
12	15.3	5.508	4.437	13.005	14.994	641.96	82.75	ID
13	12.8	4.608	4.352	12.032	12.288	803.11	139.15	IL
14	14.5	3.625	4.205	13.775	13.775	710.46	108.92	IN
15	15.7	2.669	3.925	15.229	13.659	649.06	114.47	IA
16	17.8	4.806	4.272	13.706	15.130	780.45	133.80	KS
17	21.4	4.066	4.922	16.692	16.264	872.51	137.13	KY
18	20.5	7.175	6.765	14.965	20.090	1281.55	194.78	LA
19	15.1	5.738	4.530	13.137	12.684	661.88	96.57	ME
20	12.5	4.250	4.000	8.875	12.375	1048.78	192.70	MD
21	8.2	1.886	2.870	7.134	6.560	1011.14	135.63	MA
22	14.1	3.384	3.948	13.395	10.857	1110.61	152.26	MI
23	9.6	2.208	2.784	8.448	8.448	777.18	133.35	MN
24	17.6	2.640	5.456	1.760	17.600	896.07	155.77	MS
25	16.1	6.923	5.474	14.812	13.524	790.32	144.45	MO
26	21.4	8.346	9.416	17.976	18.190	816.21	85.15	MT
27	14.9	1.937	5.215	13.857	13.410	732.28	114.82	NE
28	14.7	5.439	4.704	13.965	14.553	1029.87	138.71	NV
29	11.6	4.060	3.480	10.092	9.628	746.54	120.21	NH
30	11.2	1.792	3.136	9.632	8.736	1301.52	159.85	NJ
31	18.4	3.496	4.968	12.328	18.032	869.85	120.75	NM
32	12.3	3.936	3.567	10.824	9.840	1234.31	150.01	NY
33	16.8	6.552	5.208	15.792	13.608	708.24	127.82	NC
34	23.9	5.497	10.038	23.661	20.554	688.75	109.72	ND
35	14.1	3.948	4.794	13.959	11.562	697.73	133.52	OH
36	19.9	6.368	5.771	18.308	18.706	881.51	178.86	OK
37	12.8	4.224	3.328	8.576	11.520	804.71	104.61	OR
38	18.2	9.100	5.642	17.472	16.016	905.99	153.86	PA
39	11.1	3.774	4.218	10.212	8.769	1148.99	148.58	RI
40	23.9	9.082	9.799	22.944	19.359	858.97	116.29	SC
41	19.4	6.014	6.402	19.012	16.684	669.31	96.87	SD
42	19.5	4.095	5.655	15.990	15.795	767.91	155.57	TN
43	19.4	7.760	7.372	17.654	16.878	1004.75	156.83	TX
44	11.3	4.859	1.808	9.944	10.848	809.38	109.48	UT
45	13.6	4.080	4.080	13.056	12.920	716.20	109.61	VT
46	12.7	2.413	3.429	11.049	11.176	768.95	153.72	VA
47	10.6	4.452	3.498	8.692	9.116	890.03	111.62	WA
48	23.8	8.092	6.664	23.086	20.706	992.61	152.56	WV
49	13.8	4.968	4.554	5.382	11.592	670.31	106.62	WI
50	17.4	7.308	5.568	14.094	15.660	791.14	122.04	WY

In [3]:
```python
dset.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 51 entries, 0 to 50
Data columns (total 8 columns):
 #   Column          Non-Null Count  Dtype
---  ------          --------------  -----
 0   total           51 non-null     float64
 1   speeding        51 non-null     float64
 2   alcohol         51 non-null     float64
 3   not_distracted  51 non-null     float64
 4   no_previous     51 non-null     float64
 5   ins_premium     51 non-null     float64
 6   ins_losses      51 non-null     float64
 7   abbrev          51 non-null     object
dtypes: float64(7), object(1)
memory usage: 3.3+ KB
```

In [4]:
```python
dset.head()
```

Out[4]:

	total	speeding	alcohol	not_distracted	no_previous	ins_premium	ins_losses	abbrev
0	18.8	7.332	5.640	18.048	15.040	784.55	145.08	AL
1	18.1	7.421	4.525	16.290	17.014	1053.48	133.93	AK
2	18.6	6.510	5.208	15.624	17.856	899.47	110.35	AZ
3	22.4	4.032	5.824	21.056	21.280	827.34	142.39	AR
4	12.0	4.200	3.360	10.920	10.680	878.41	165.63	CA

In [5]:
```python
dset.tail()
```

Out[5]:

	total	speeding	alcohol	not_distracted	no_previous	ins_premium	ins_losses	abbrev
46	12.7	2.413	3.429	11.049	11.176	768.95	153.72	VA
47	10.6	4.452	3.498	8.692	9.116	890.03	111.62	WA
48	23.8	8.092	6.664	23.086	20.706	992.61	152.56	WV
49	13.8	4.968	4.554	5.382	11.592	670.31	106.62	WI
50	17.4	7.308	5.568	14.094	15.660	791.14	122.04	WY

HEAT MAP

In [6]:
```python
corr=dset.corr()
corr
```

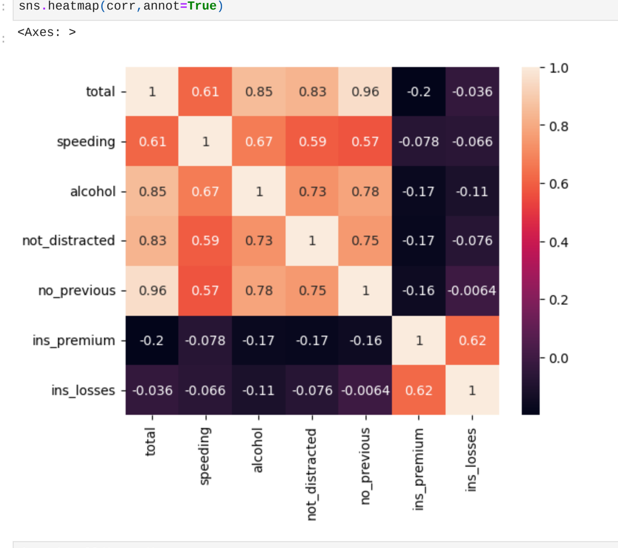
```
<ipython-input-6-dc92a5ab8bf7>:1: FutureWarning: The default value of numeric_only in DataFrame.corr is deprecated. In a future version, it will default to False. Select only valid columns or specify the value of numeric_only to silence this warning.
  corr=dset.corr()
```

Out[6]:

	total	speeding	alcohol	not_distracted	no_previous	ins_premium	ins_losses
total	1.000000	0.611548	0.852613	0.827560	0.956179	-0.199702	-0.036011
speeding	0.611548	1.000000	0.669719	0.588010	0.571976	-0.077675	-0.065928
alcohol	0.852613	0.669719	1.000000	0.732816	0.783520	-0.170612	-0.112547
not_distracted	0.827560	0.588010	0.732816	1.000000	0.747307	-0.174856	-0.075970
no_previous	0.956179	0.571976	0.783520	0.747307	1.000000	-0.156895	-0.006359
ins_premium	-0.199702	-0.077675	-0.170612	-0.174856	-0.156895	1.000000	0.623116
ins_losses	-0.036011	-0.065928	-0.112547	-0.075970	-0.006359	0.623116	1.000000

In [7]:
```python
sns.heatmap(corr,annot=True)
```

Out[7]: <Axes: >



In [8]:
```python
dset.isnull().any()
```

Out[8]:
```
total             False
speeding          False
alcohol           False
not_distracted    False
no_previous       False
ins_premium       False
ins_losses        False
abbrev            False
dtype: bool
```

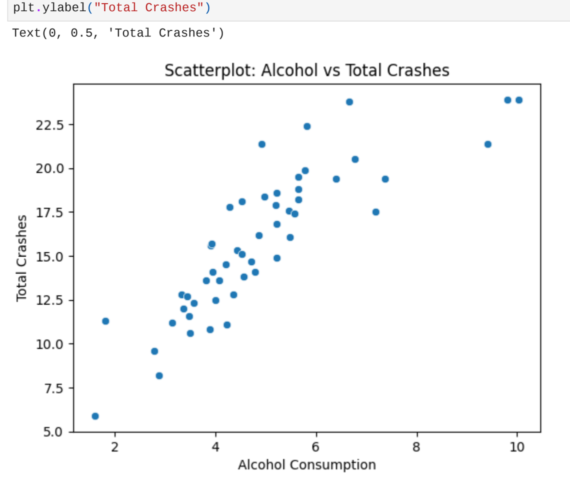
In [9]:
```python
dset.isnull().sum()
```

Out[9]:
```
total             0
speeding          0
alcohol           0
not_distracted    0
no_previous       0
ins_premium       0
ins_losses        0
abbrev            0
dtype: int64
```

SCATTER PLOT

In [10]:
```python
sns.scatterplot(x="alcohol", y="total", data=dset)
plt.title("Scatterplot: Alcohol vs Total Crashes")
plt.xlabel("Alcohol Consumption")
plt.ylabel("Total Crashes")
```

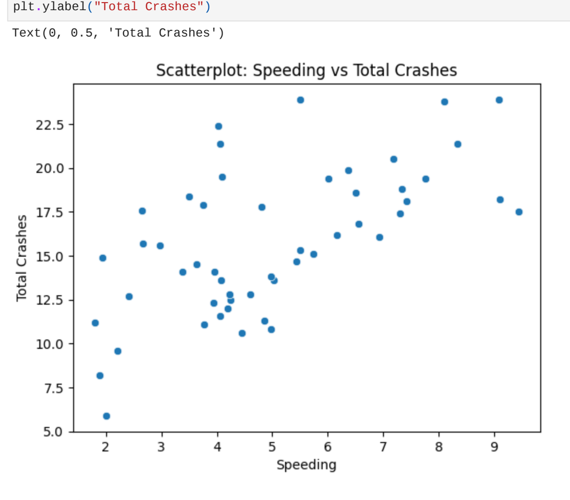
Out[10]: Text(0, 0.5, 'Total Crashes')



Inference: Positive correlation between alcohol consumption and total crashes from the above plot, i.e as the alcohol consumption increases the total crashes increases.

In [11]:
```python
sns.scatterplot(x="speeding", y="total", data=dset)
plt.title("Scatterplot: Speeding vs Total Crashes")
plt.xlabel("Speeding")
plt.ylabel("Total Crashes")
```

Out[11]: Text(0, 0.5, 'Total Crashes')

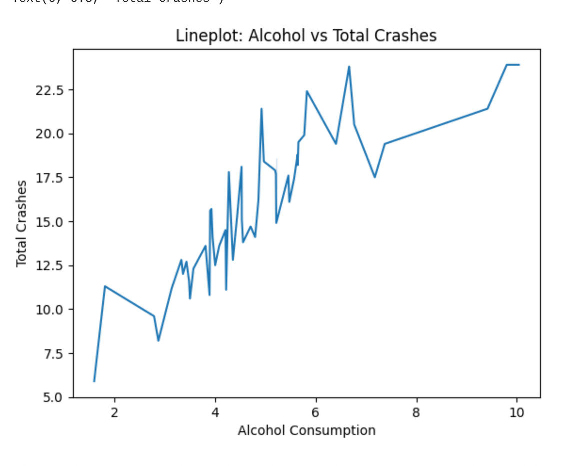


Inference: Speeding doesn't show a clear linear trend with total crashes.

LINE PLOT

In [12]:
```python
sns.lineplot(x="alcohol", y="total", data=dset)
plt.title("Lineplot: Alcohol vs Total Crashes")
plt.xlabel("Alcohol Consumption")
plt.ylabel("Total Crashes")
```

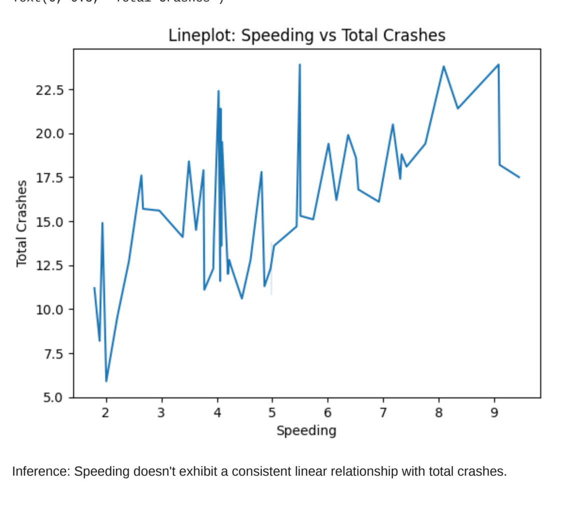
Out[12]: Text(0, 0.5, 'Total Crashes')



Inference: No obvious linear trend in the relationship between alcohol consumption and total crashes.

In [13]:
```python
sns.lineplot(x="speeding", y="total", data=dset)
plt.title("Lineplot: Speeding vs Total Crashes")
plt.xlabel("Speeding")
plt.ylabel("Total Crashes")
```

Out[13]: Text(0, 0.5, 'Total Crashes')

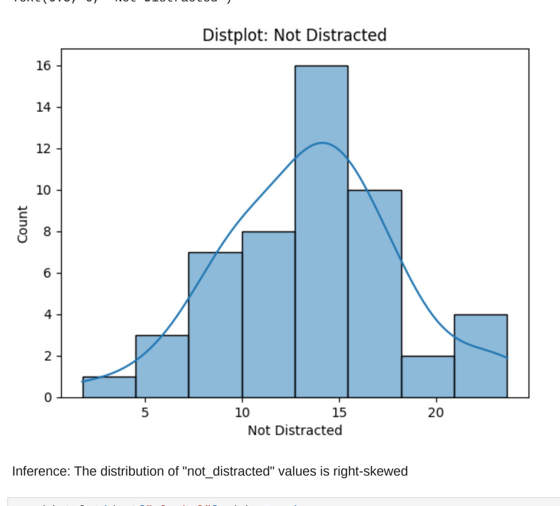


Inference: Speeding doesn't exhibit a consistent linear relationship with total crashes.

DISTRIBUTION PLOT

In [14]:
```python
sns.histplot(dset["not_distracted"], kde=True)
plt.title("Distplot: Not Distracted")
plt.xlabel("Not Distracted")
```

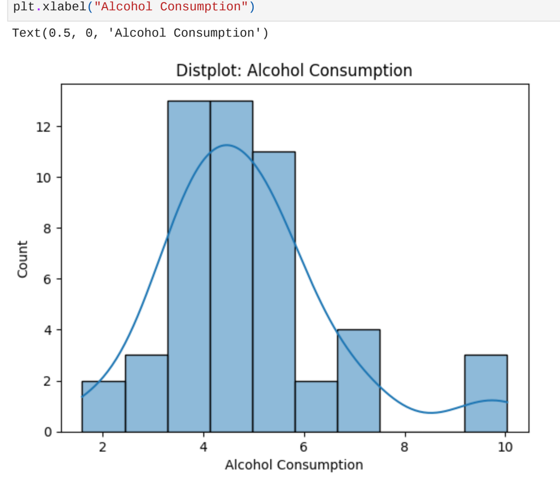
Out[14]: Text(0.5, 0, 'Not Distracted')



Inference: The distribution of "not_distracted" values is right-skewed

In [15]:
```python
sns.histplot(dset["alcohol"], kde=True)
plt.title("Distplot: Alcohol Consumption")
plt.xlabel("Alcohol Consumption")
```

Out[15]: Text(0.5, 0, 'Alcohol Consumption')

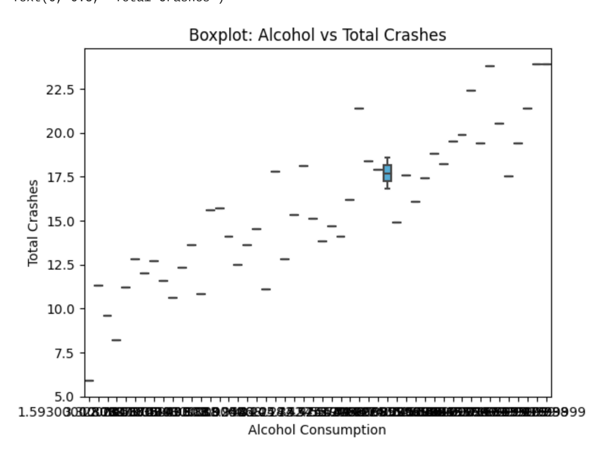


Inference: The distribution of alcohol consumption appears to be right-skewed as well

BOX PLOT

In [16]:
```python
sns.boxplot(x="alcohol", y="total", data=dset)
plt.title("Boxplot: Alcohol vs Total Crashes")
plt.xlabel("Alcohol Consumption")
plt.ylabel("Total Crashes")
```

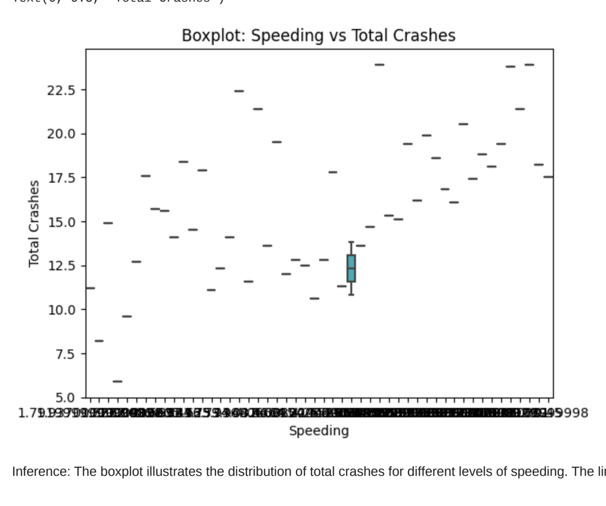
Out[16]: Text(0, 0.5, 'Total Crashes')



Inference: The boxplot shows the distribution of total crashes for different levels of alcohol consumption. The lines indicates the outliers

In [17]:
```python
sns.boxplot(x="speeding", y="total", data=dset)
plt.title("Boxplot: Speeding vs Total Crashes")
plt.xlabel("Speeding")
plt.ylabel("Total Crashes")
```

Out[17]: Text(0, 0.5, 'Total Crashes')

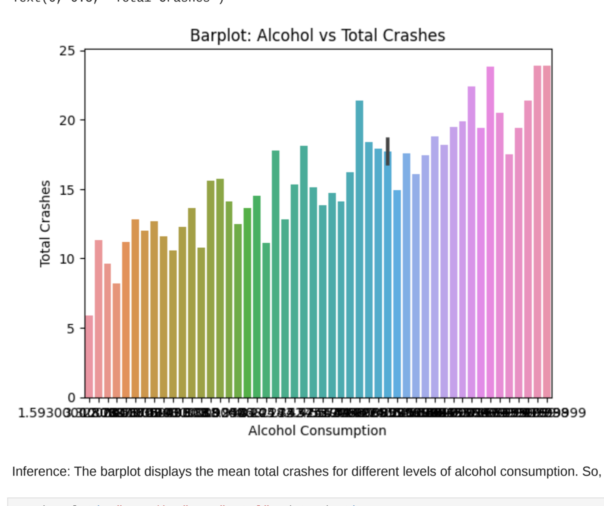


Inference: The boxplot illustrates the distribution of total crashes for different levels of speeding. The lines indicate the outliers.

BAR PLOT

In [18]:
```python
sns.barplot(x="alcohol", y="total", data=dset)
plt.title("Barplot: Alcohol vs Total Crashes")
plt.xlabel("Alcohol Consumption")
plt.ylabel("Total Crashes")
```

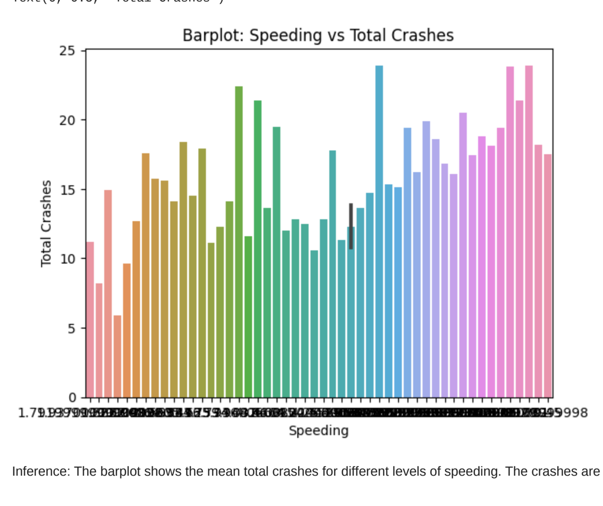
Out[18]: Text(0, 0.5, 'Total Crashes')



Inference: The barplot displays the mean total crashes for different levels of alcohol consumption. So, if the alcohol consumption is high, then total crashes are also high.

In [19]:
```python
sns.barplot(x="speeding", y="total", data=dset)
plt.title("Barplot: Speeding vs Total Crashes")
plt.xlabel("Speeding")
plt.ylabel("Total Crashes")
```

Out[19]: Text(0, 0.5, 'Total Crashes')

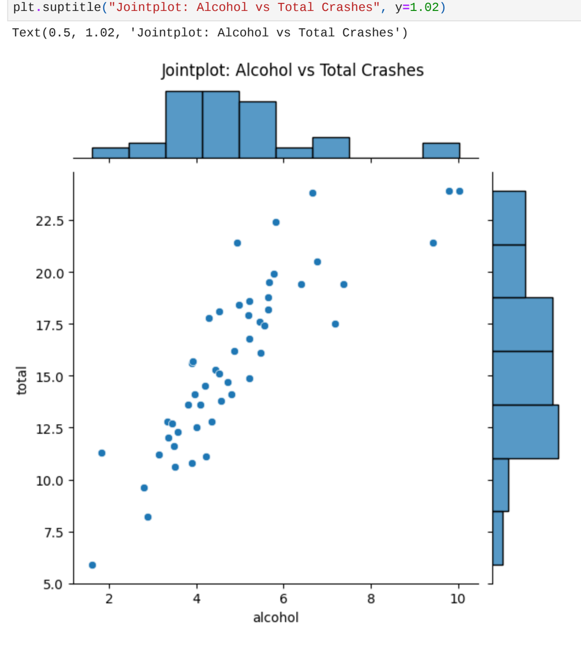


Inference: The barplot shows the mean total crashes for different levels of speeding. The crashes are high even at low speed levels also.

JOINT PLOT

In [20]:
```python
sns.jointplot(x="alcohol", y="total", data=dset, kind="scatter")
plt.suptitle("Jointplot: Alcohol vs Total Crashes", y=1.02)
```

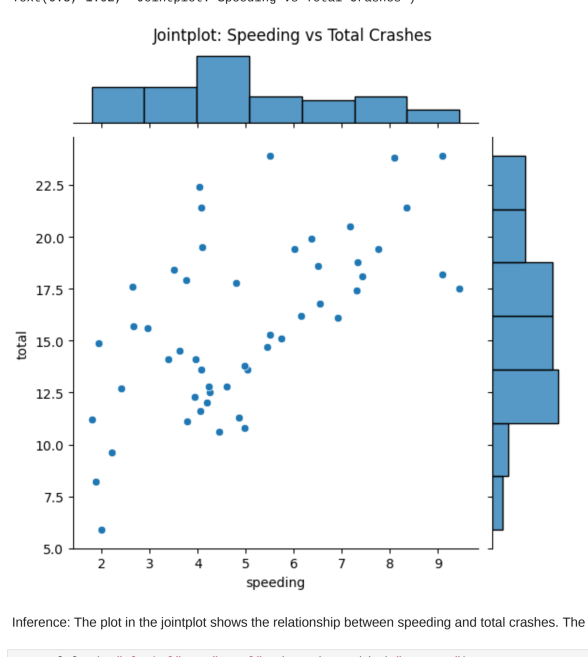
Out[20]: Text(0.5, 1.02, 'Jointplot: Alcohol vs Total Crashes')



Inference: The plot in the jointplot reveals the relationship between alcohol consumption and total crashes. So, as the alcohol increases, the total crashes also increase.

In [21]:
```python
sns.jointplot(x="speeding", y="total", data=dset, kind="scatter")
plt.suptitle("Jointplot: Speeding vs Total Crashes", y=1.02)
```

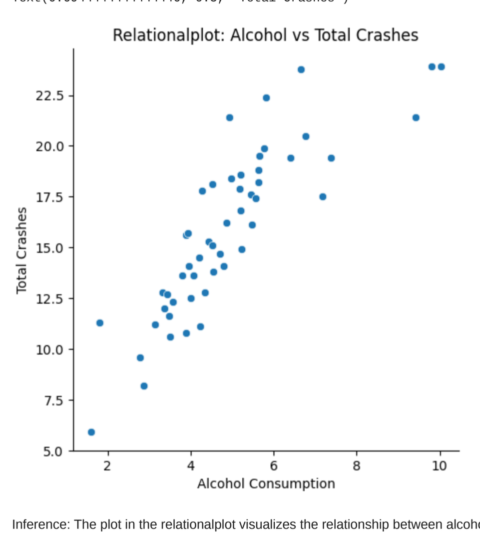
Out[21]: Text(0.5, 1.02, 'Jointplot: Speeding vs Total Crashes')



Inference: The plot in the jointplot shows the relationship between speeding and total crashes. The plot is not in a specific pattern.

In [22]:
```python
sns.relplot(x="alcohol", y="total", data=dset, kind="scatter")
plt.title("Relationalplot: Alcohol vs Total Crashes")
plt.xlabel("Alcohol Consumption")
plt.ylabel("Total Crashes")
```

Out[22]: Text(0.6944444444444446, 0.5, 'Total Crashes')

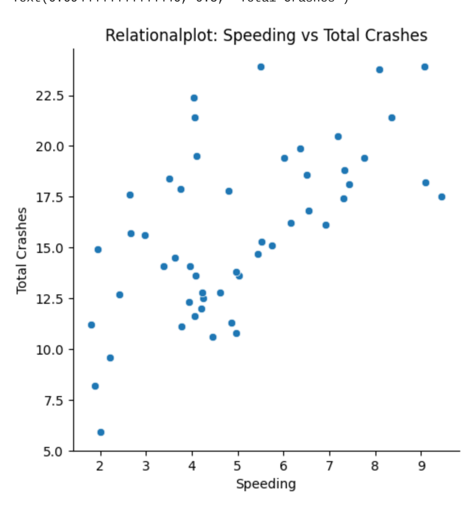


Inference: The plot in the relationalplot visualizes the relationship between alcohol consumption and total crashes and it is directly proportional.

RELATION PLOT

In [23]:
```python
sns.relplot(x="speeding", y="total", data=dset, kind="scatter")
plt.title("Relationalplot: Speeding vs Total Crashes")
plt.xlabel("Speeding")
plt.ylabel("Total Crashes")
```

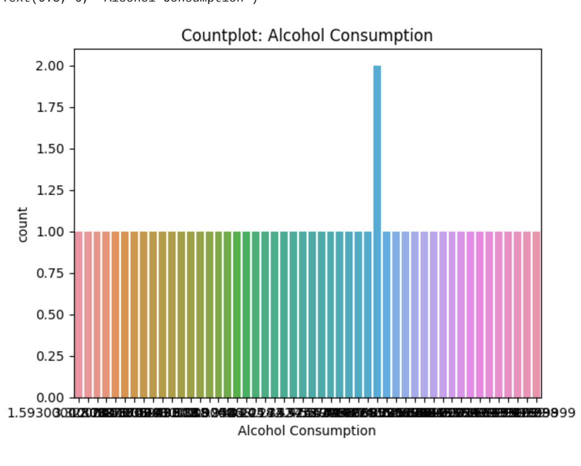
Out[23]: Text(0.6944444444444446, 0.5, 'Total Crashes')



Inference: The scatter plot in the relationalplot illustrates the relationship between speeding and total crashes and it is not in a specific pattern.

In [24]:
```python
sns.countplot(x="alcohol", data=dset)
plt.title("Countplot: Alcohol Consumption")
plt.xlabel("Alcohol Consumption")
```

Out[24]: Text(0.5, 0, 'Alcohol Consumption')

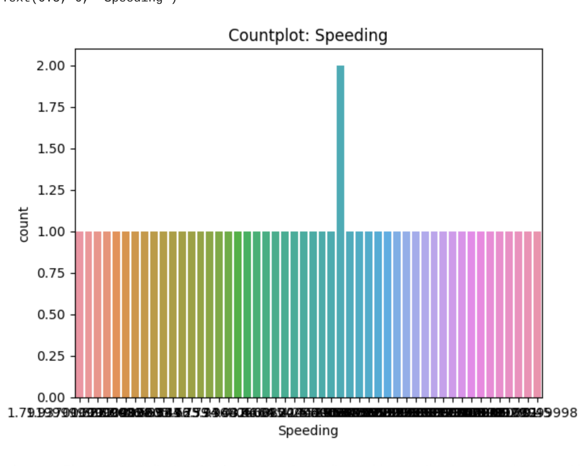


Inference: This countplot shows the frequency of different levels of alcohol consumption in the dataset and the count is maximum as 2 at a particular alcohol consumption and 1 otherwise.

COUNT PLOT

In [25]:
```python
sns.countplot(x="speeding", data=dset)
plt.title("Countplot: Speeding")
plt.xlabel("Speeding")
```

Out[25]: Text(0.5, 0, 'Speeding')



Inference: This countplot displays the frequency of speeding incidents in the dataset and the count is maximum as 2 at a particular alcohol consumption and 1 otherwise.