cognorise info task1

March 7, 2024

1 COGNORISE INFOTECH - TASK1

2 80 CEREALS

[4]:
```
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import numpy as np
```

[5]:
```
# import dataset
```

[6]:
```
df=pd.read_csv('cereal.csv')
```

[7]:
```
df
```

[7]:

	name	mfr	type	calories	protein	fat	sodium	fiber
0	100% Bran	N	C	70	4	1	130	10.0
1	100% Natural Bran	Q	C	120	3	5	15	2.0
2	All-Bran	K	C	70	4	1	260	9.0
3	All-Bran with Extra Fiber	K	C	50	4	0	140	14.0
4	Almond Delight	R	C	110	2	2	200	1.0
..	…	..	…	…	…	…	…	…
72	Triples	G	C	110	2	1	250	0.0
73	Trix	G	C	110	1	1	140	0.0
74	Wheat Chex	R	C	100	3	1	230	3.0
75	Wheaties	G	C	100	3	1	200	3.0
76	Wheaties Honey Gold	G	C	110	2	1	200	1.0

	carbo	sugars	potass	vitamins	shelf	weight	cups	rating
0	5.0	6	280	25	3	1.0	0.33	68.402973
1	8.0	8	135	0	3	1.0	1.00	33.983679
2	7.0	5	320	25	3	1.0	0.33	59.425505
3	8.0	0	330	25	3	1.0	0.50	93.704912
4	14.0	8	-1	25	3	1.0	0.75	34.384843
..	…	…	…	…	…	…	…	…
72	21.0	3	60	25	3	1.0	0.75	39.106174
73	13.0	12	25	25	2	1.0	1.00	27.753301

```
74   17.0       3     115        25      1     1.0  0.67  49.787445
75   17.0       3     110        25      1     1.0  1.00  51.592193
76   16.0       8      60        25      1     1.0  0.75  36.187559

[77 rows x 16 columns]
```

[8]:
```
df.shape
```

[8]:
```
(77, 16)
```

[9]:
```
df.describe()
```

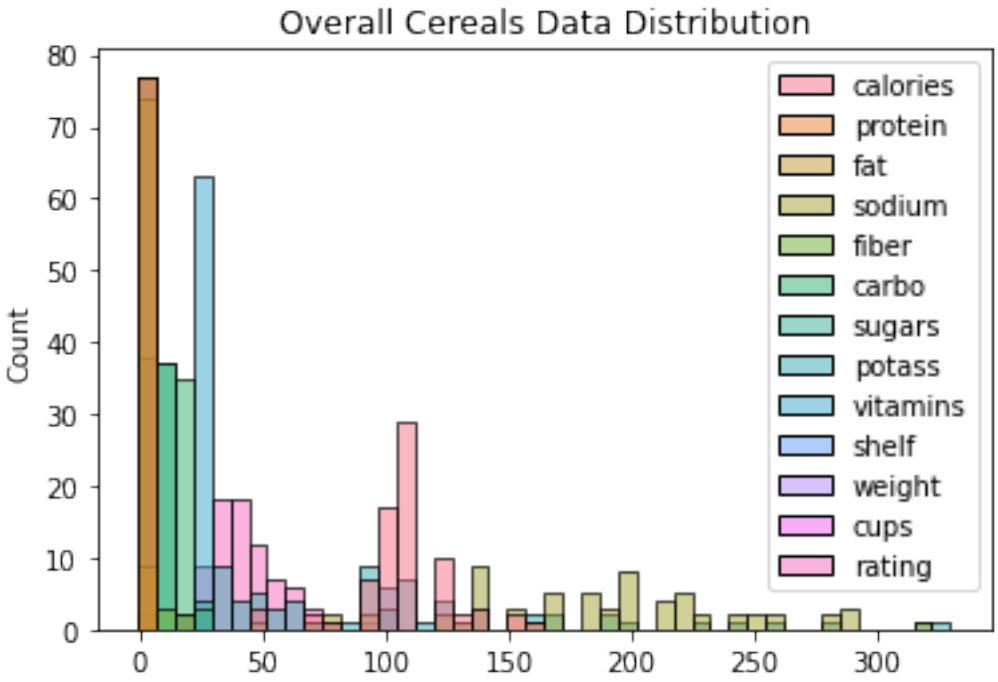
[9]:
```
          calories    protein        fat      sodium      fiber      carbo  \
count   77.000000  77.000000  77.000000   77.000000  77.000000  77.000000
mean   106.883117   2.545455   1.012987  159.675325   2.151948  14.597403
std     19.484119   1.094790   1.006473   83.832295   2.383364   4.278956
min     50.000000   1.000000   0.000000    0.000000   0.000000  -1.000000
25%    100.000000   2.000000   0.000000  130.000000   1.000000  12.000000
50%    110.000000   3.000000   1.000000  180.000000   2.000000  14.000000
75%    110.000000   3.000000   2.000000  210.000000   3.000000  17.000000
max    160.000000   6.000000   5.000000  320.000000  14.000000  23.000000

           sugars      potass    vitamins      shelf     weight       cups  \
count  77.000000   77.000000   77.000000  77.000000  77.000000  77.000000
mean    6.922078   96.077922   28.246753   2.207792   1.029610   0.821039
std     4.444885   71.286813   22.342523   0.832524   0.150477   0.232716
min    -1.000000   -1.000000    0.000000   1.000000   0.500000   0.250000
25%     3.000000   40.000000   25.000000   1.000000   1.000000   0.670000
50%     7.000000   90.000000   25.000000   2.000000   1.000000   0.750000
75%    11.000000  120.000000   25.000000   3.000000   1.000000   1.000000
max    15.000000  330.000000  100.000000   3.000000   1.500000   1.500000

          rating
count  77.000000
mean   42.665705
std    14.047289
min    18.042851
25%    33.174094
50%    40.400208
75%    50.828392
max    93.704912
```

[10]:
```
df.isnull().sum().sum()
```

[10]:
```
0
```

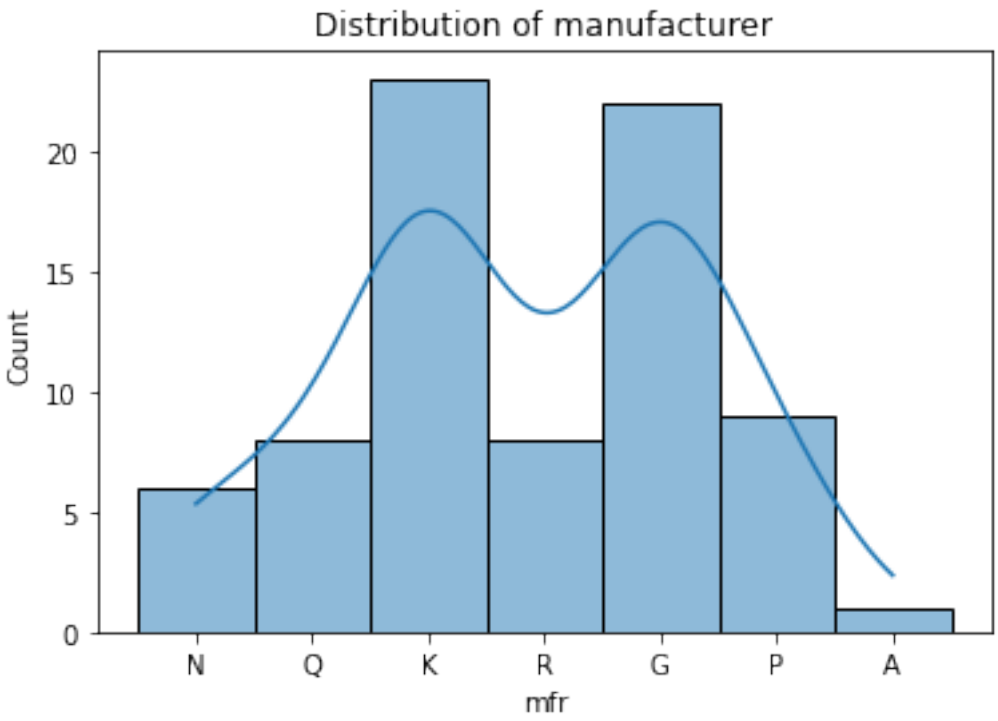
[11]:
```
plt.title("Overall Cereals Data Distribution")
sns.histplot(data = df)
```

[11]:
```
<AxesSubplot: title={'center': 'Overall Cereals Data Distribution'},
ylabel='Count'>
```



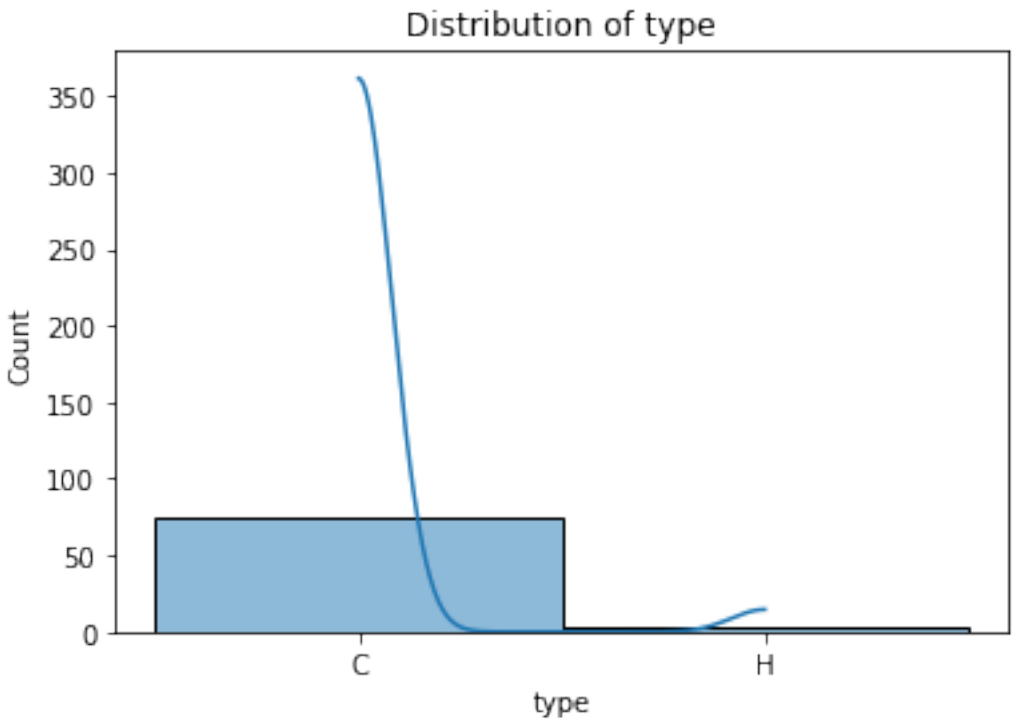
[12]:
```
sns.histplot(data=df,x='mfr', kde=True)
plt.title('Distribution of manufacturer')
```

[12]:
```
Text(0.5, 1.0, 'Distribution of manufacturer')
```



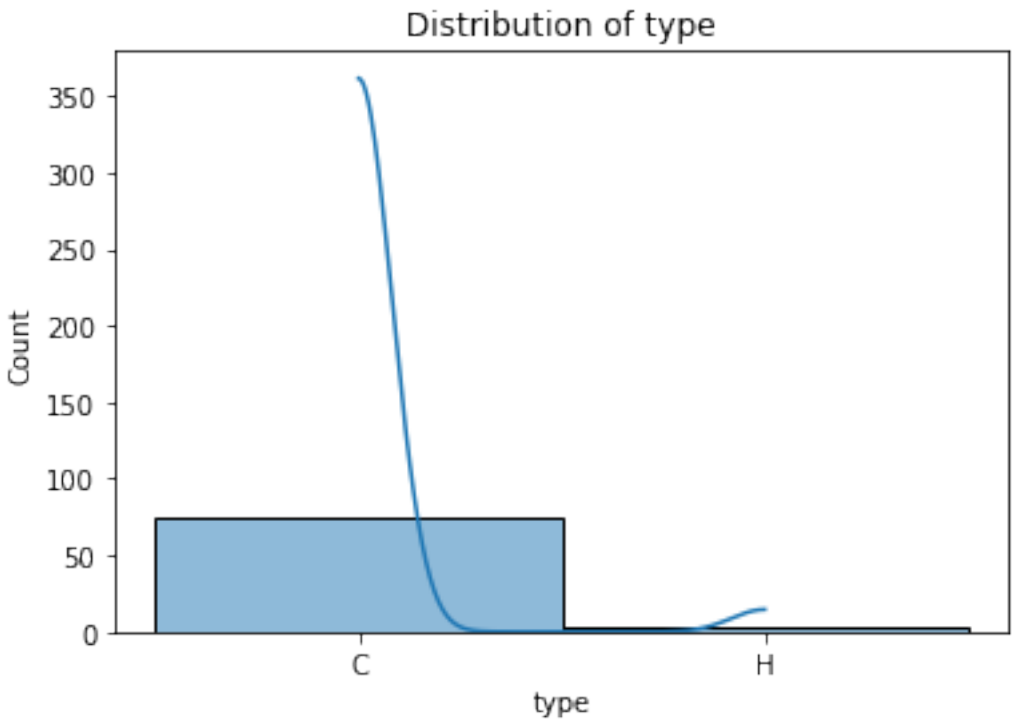
[13]:
```
sns.histplot(x='type',data=df,kde=True)
plt.title('Distribution of type')
```

[13]: Text(0.5, 1.0, 'Distribution of type')



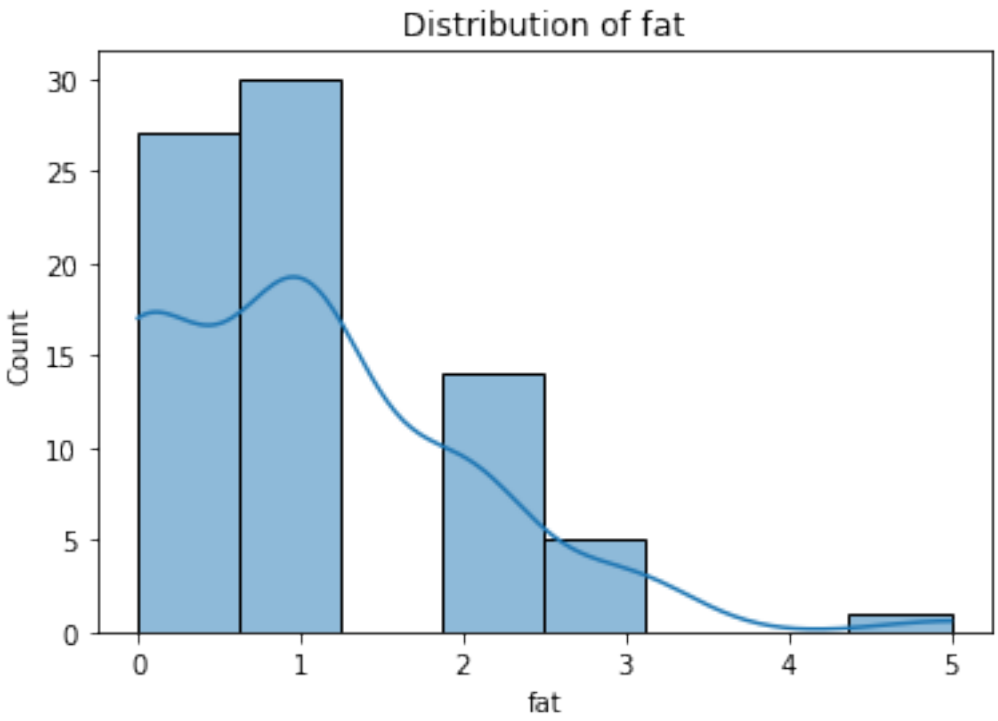
[14]:
```
sns.histplot(x='type',data=df,kde=True)
plt.title('Distribution of type')
```

[14]:
```
Text(0.5, 1.0, 'Distribution of type')
```



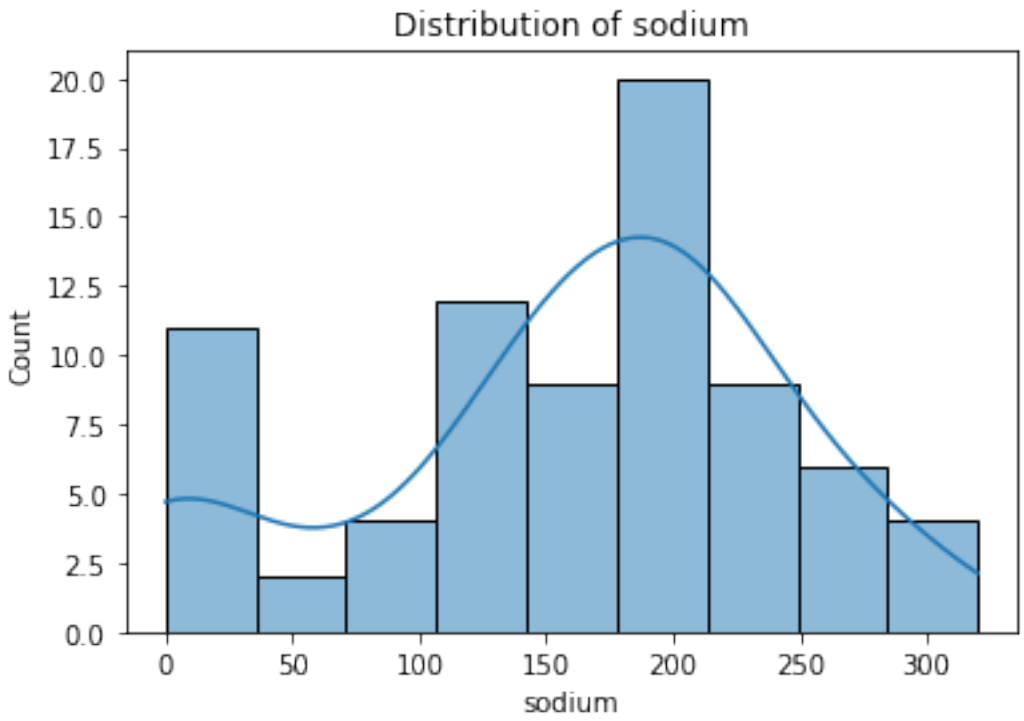
[15]:
```
sns.histplot(df['fat'],kde=True)
plt.title('Distribution of fat')
```

[15]: Text(0.5, 1.0, 'Distribution of fat')



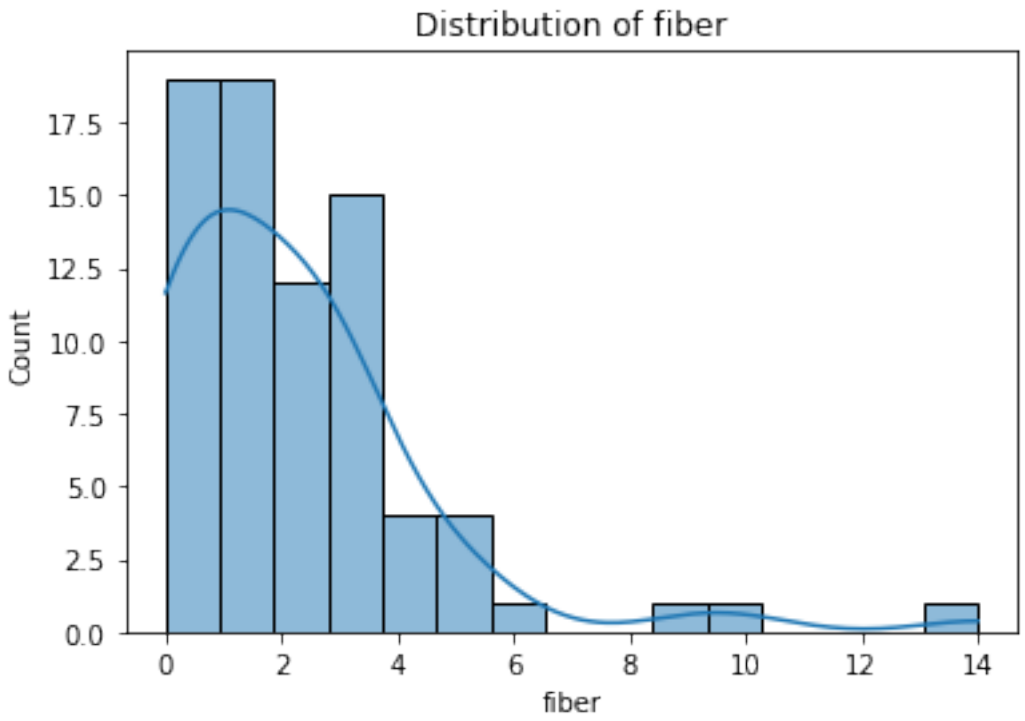
[16]:
```
sns.histplot(df['sodium'],kde=True)
plt.title('Distribution of sodium')
```

[16]: Text(0.5, 1.0, 'Distribution of sodium')



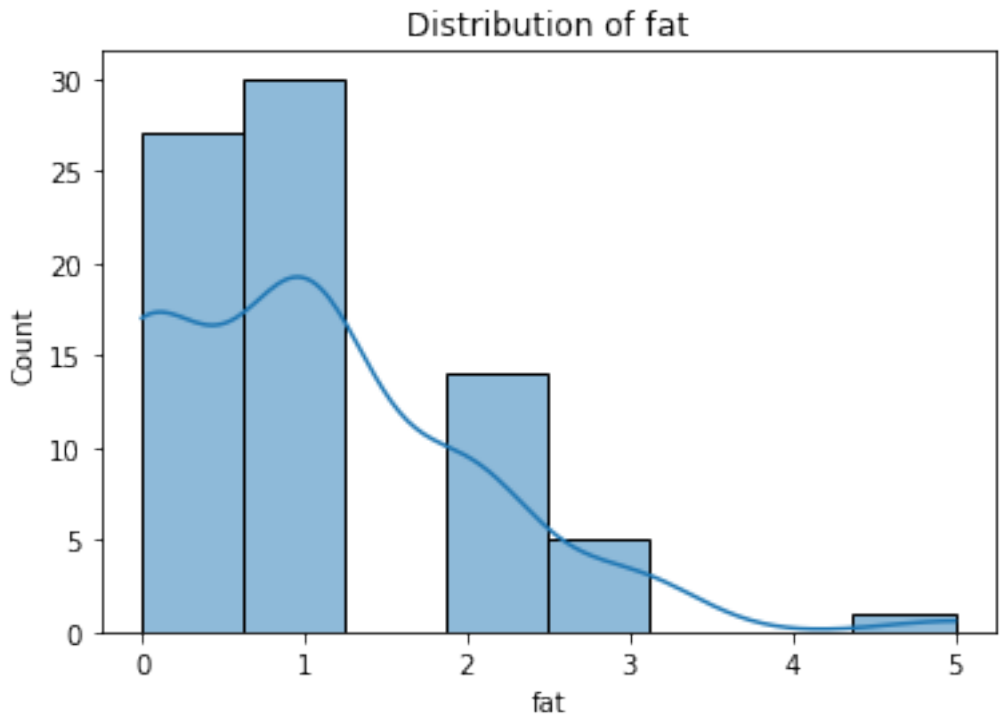
[17]:
```
sns.histplot(df['fiber'],kde=True)
plt.title('Distribution of fiber')
```

[17]: Text(0.5, 1.0, 'Distribution of fiber')



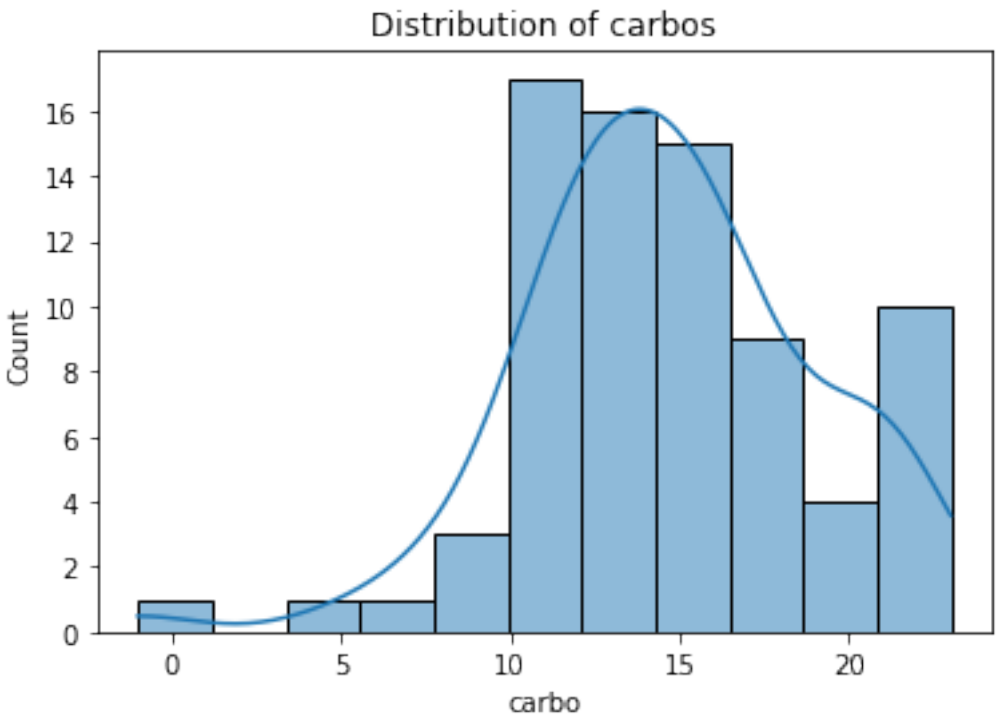
[18]:
```
sns.histplot(df['fat'],kde=True)
plt.title('Distribution of fat')
```

[18]: Text(0.5, 1.0, 'Distribution of fat')



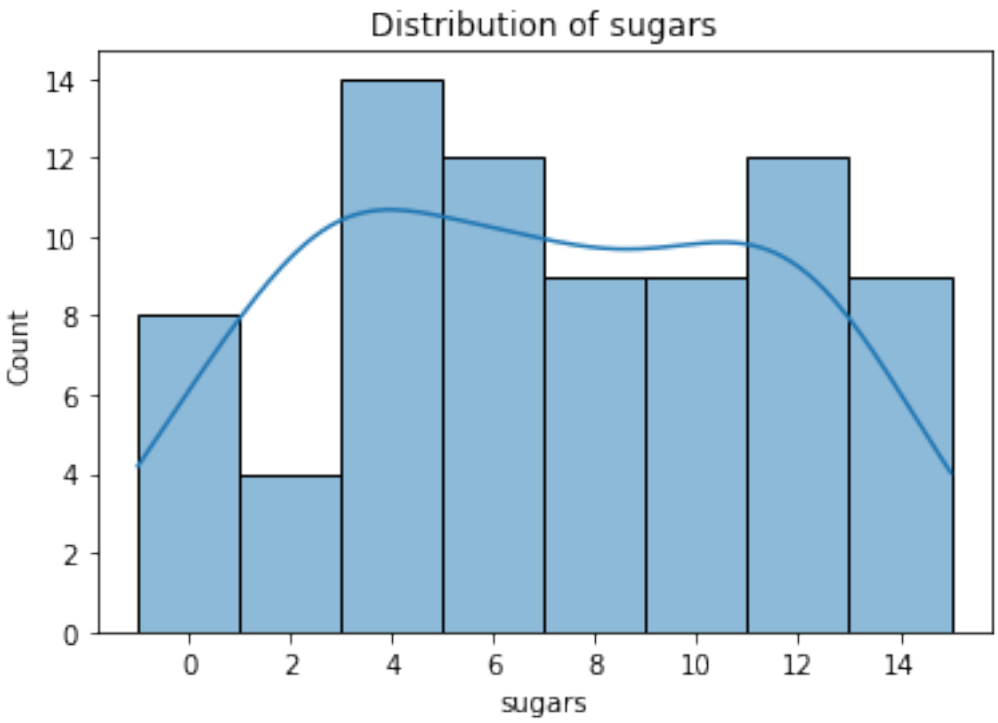
[19]:
```
sns.histplot(df['carbo'],kde=True)
plt.title('Distribution of carbos')
```

[19]:
```
Text(0.5, 1.0, 'Distribution of carbos')
```



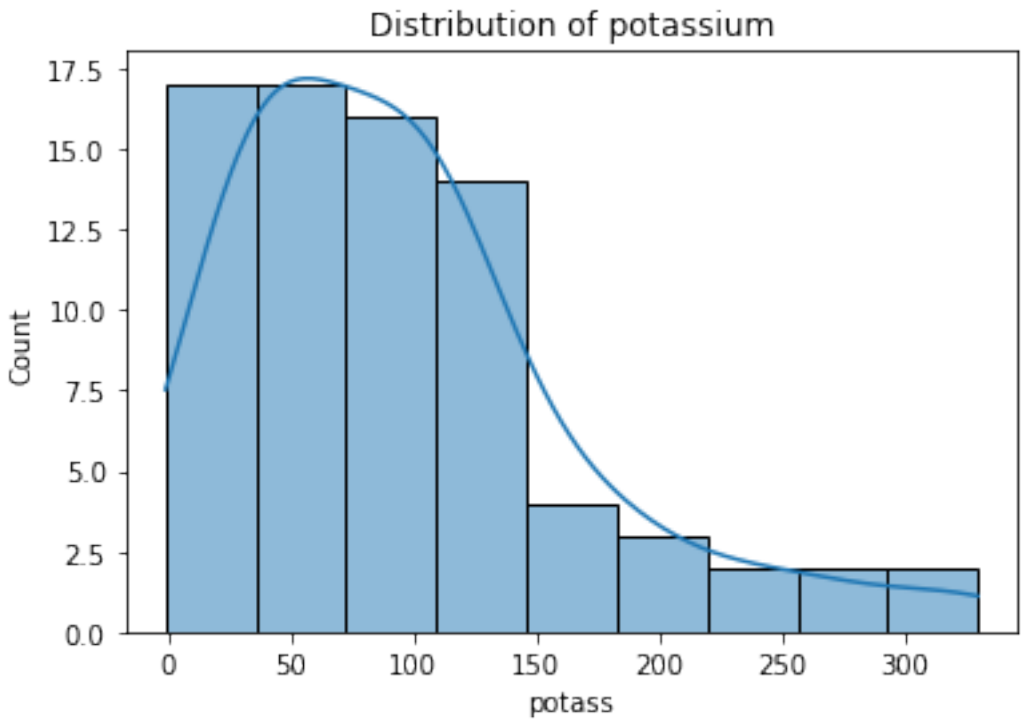
[20]:
```
sns.histplot(df['sugars'],kde=True)
plt.title('Distribution of sugars')
```

[20]: Text(0.5, 1.0, 'Distribution of sugars')



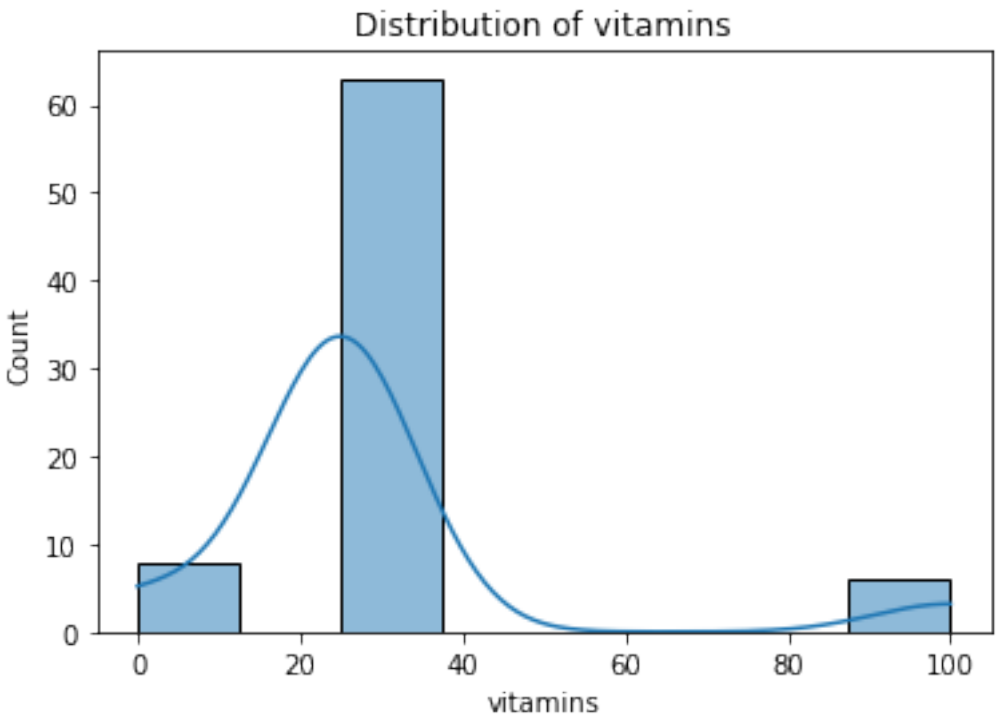
[21]:
```
sns.histplot(df['potass'],kde=True)
plt.title('Distribution of potassium')
```

[21]: Text(0.5, 1.0, 'Distribution of potassium')



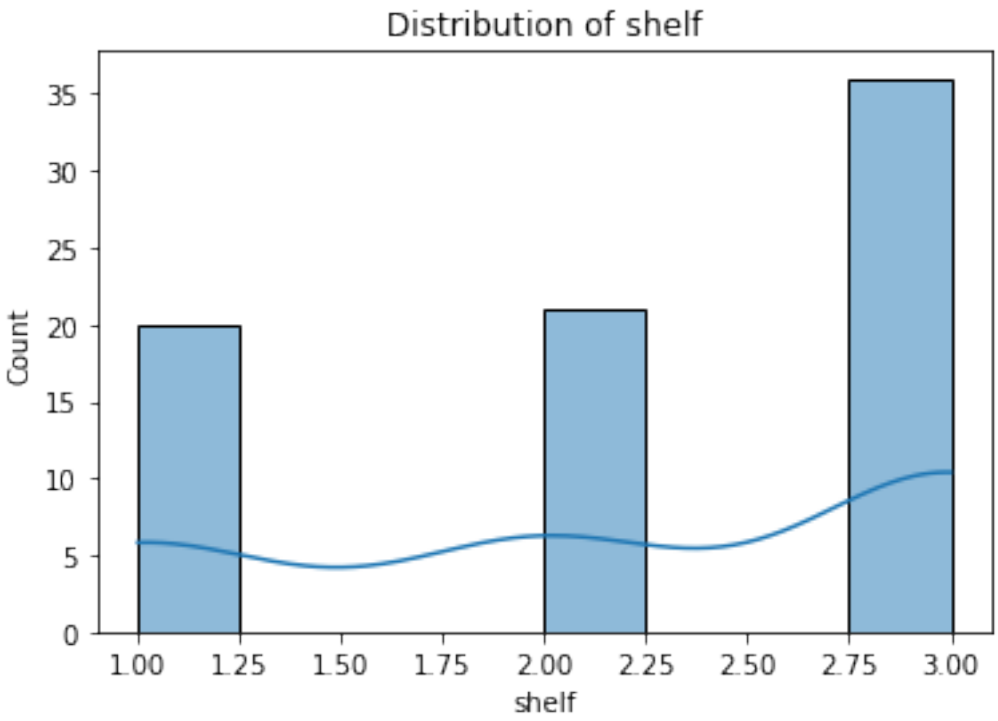
[22]:
```
sns.histplot(df['vitamins'],kde=True)
plt.title('Distribution of vitamins')
```

[22]: Text(0.5, 1.0, 'Distribution of vitamins')



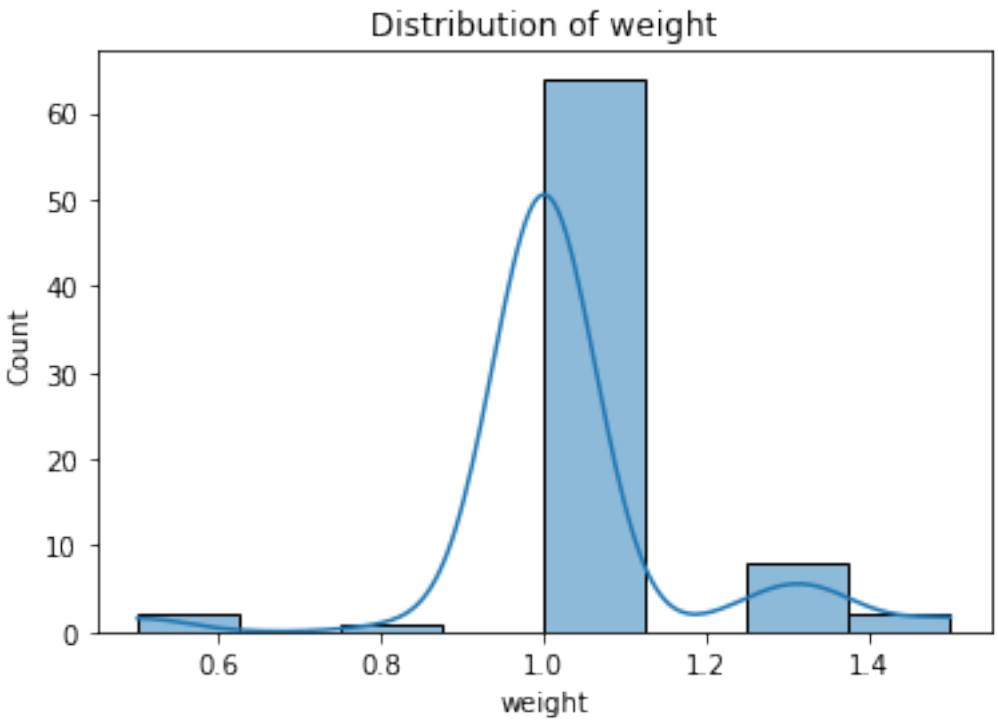
[23]:
```
 sns.histplot(df['shelf'],kde=True)
plt.title('Distribution of shelf')
```

[23]: Text(0.5, 1.0, 'Distribution of shelf')



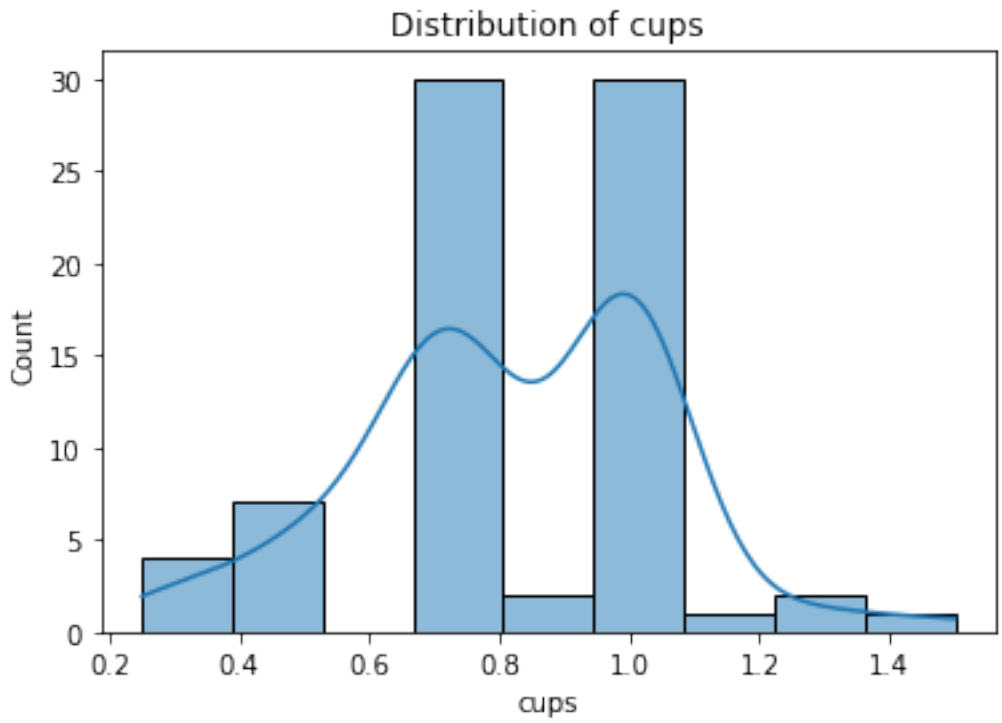
[24]:
```
sns.histplot(df['weight'],kde=True)
plt.title('Distribution of weight')
```

[24]: Text(0.5, 1.0, 'Distribution of weight')



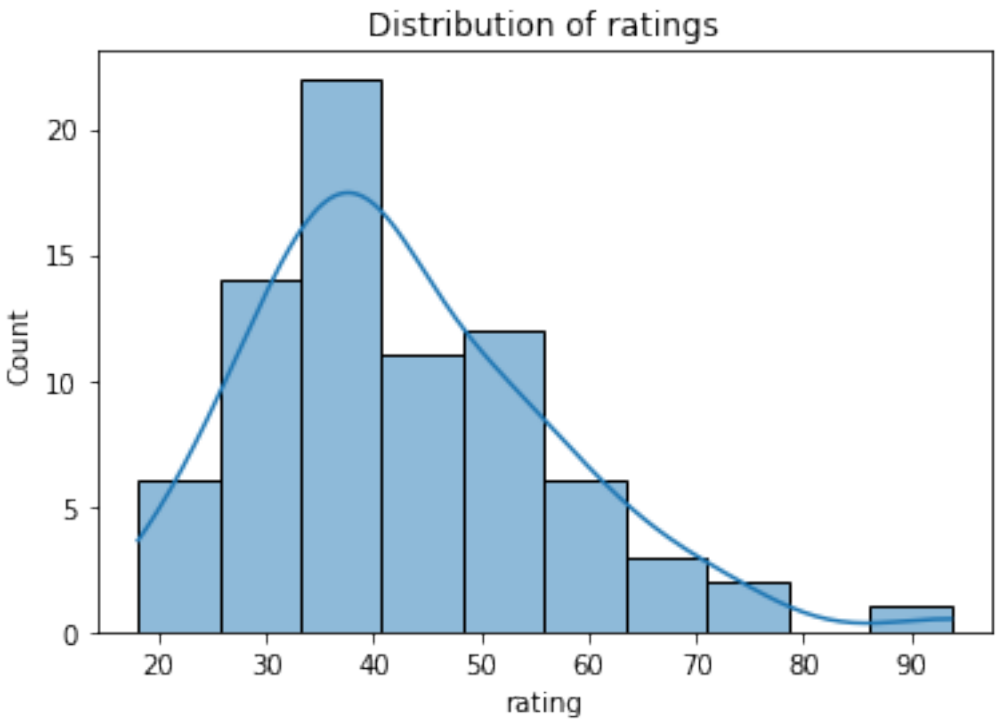
[25]:
```
sns.histplot(df['cups'],kde=True)
plt.title('Distribution of cups')
```

[25]:
```
Text(0.5, 1.0, 'Distribution of cups')
```



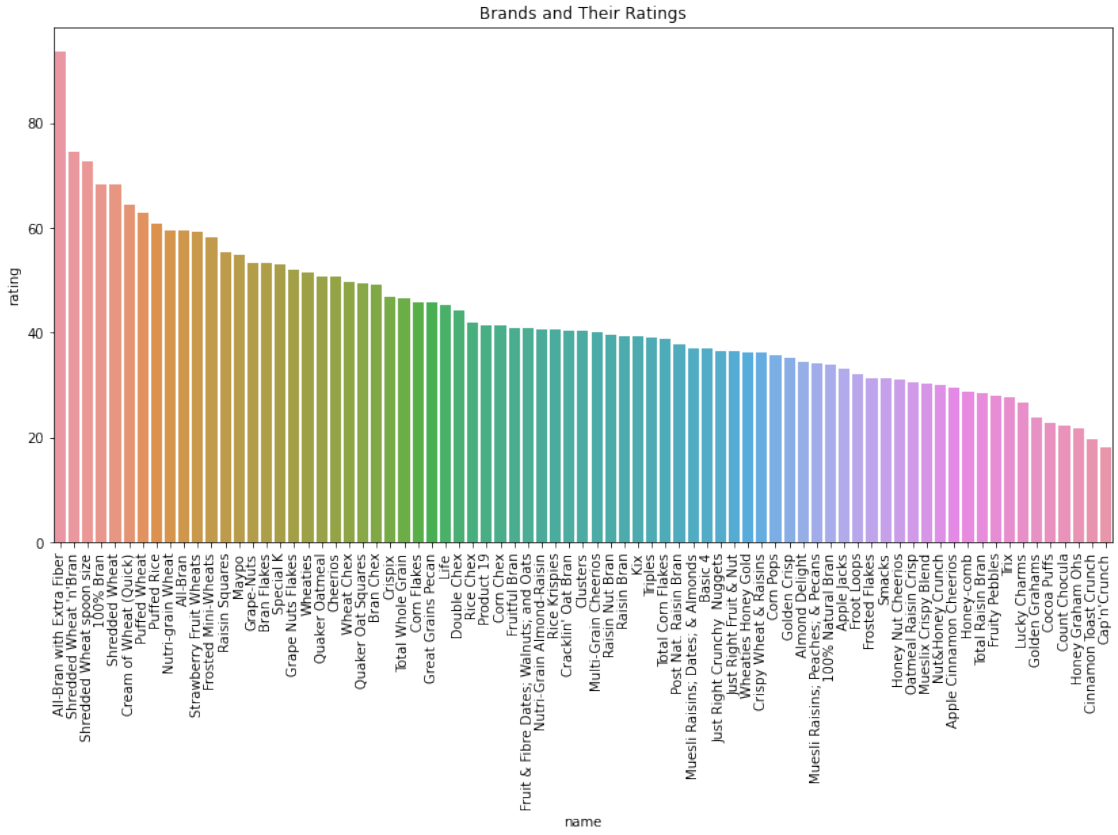
[26]:
```
sns.histplot(df['rating'],kde=True)
plt.title('Distribution of ratings')
```

[26]:
```
Text(0.5, 1.0, 'Distribution of ratings')
```



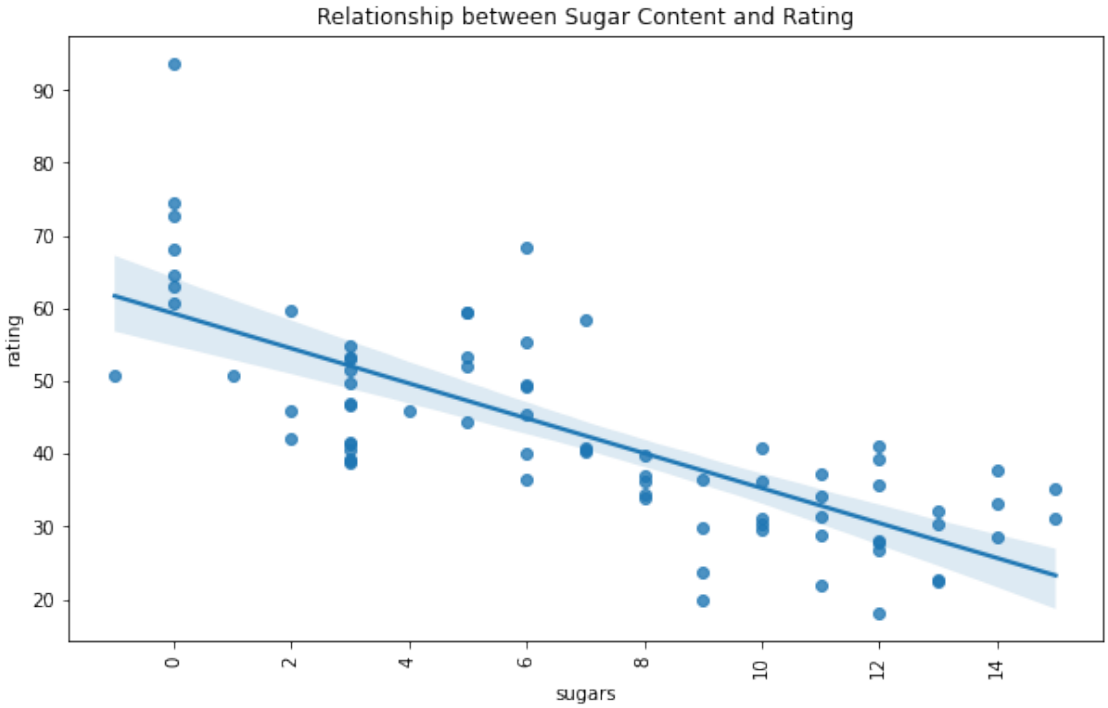
[27]:
```
# Sort the DataFrame by rating in descending order
cereals_sorted = df.sort_values(by='rating', ascending=False)
plt.figure(figsize=(14, 7))
plt.title("Brands and Their Ratings")
plt.xticks(rotation=90)
sns.barplot(data=cereals_sorted, x=cereals_sorted['name'],
 y=cereals_sorted['rating'])
```

[27]:
```
<AxesSubplot: title={'center': 'Brands and Their Ratings'}, xlabel='name',
ylabel='rating'>
```



[28]:
```
plt.figure(figsize=(10, 6))
plt.title('Relationship between Sugar Content and Rating')
plt.xticks(rotation=90)
sns.regplot(data=df, x=df['sugars'], y=df['rating'])
```

[28]:
```
<AxesSubplot: title={'center': 'Relationship between Sugar Content and Rating'},
xlabel='sugars', ylabel='rating'>
```

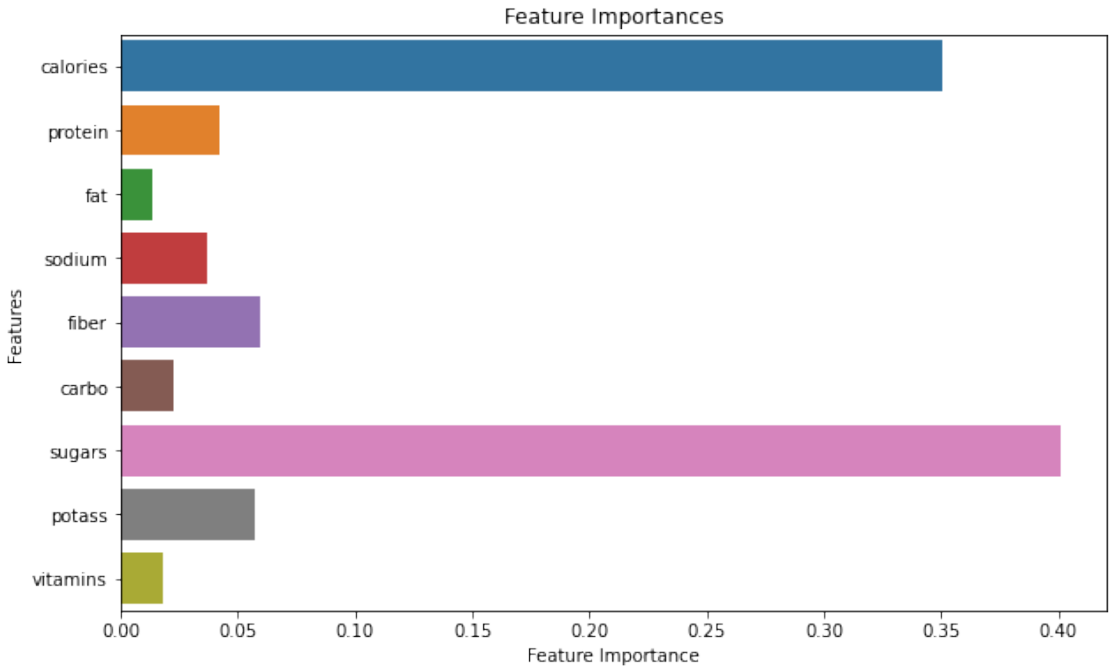


[29]:
```
 plt.figure(figsize=(10, 6))
plt.title('Relationship between Sugar Content and Rating')
plt.xticks(rotation=90)
sns.regplot(data=df, x=df['fat'], y=df['rating'])
```

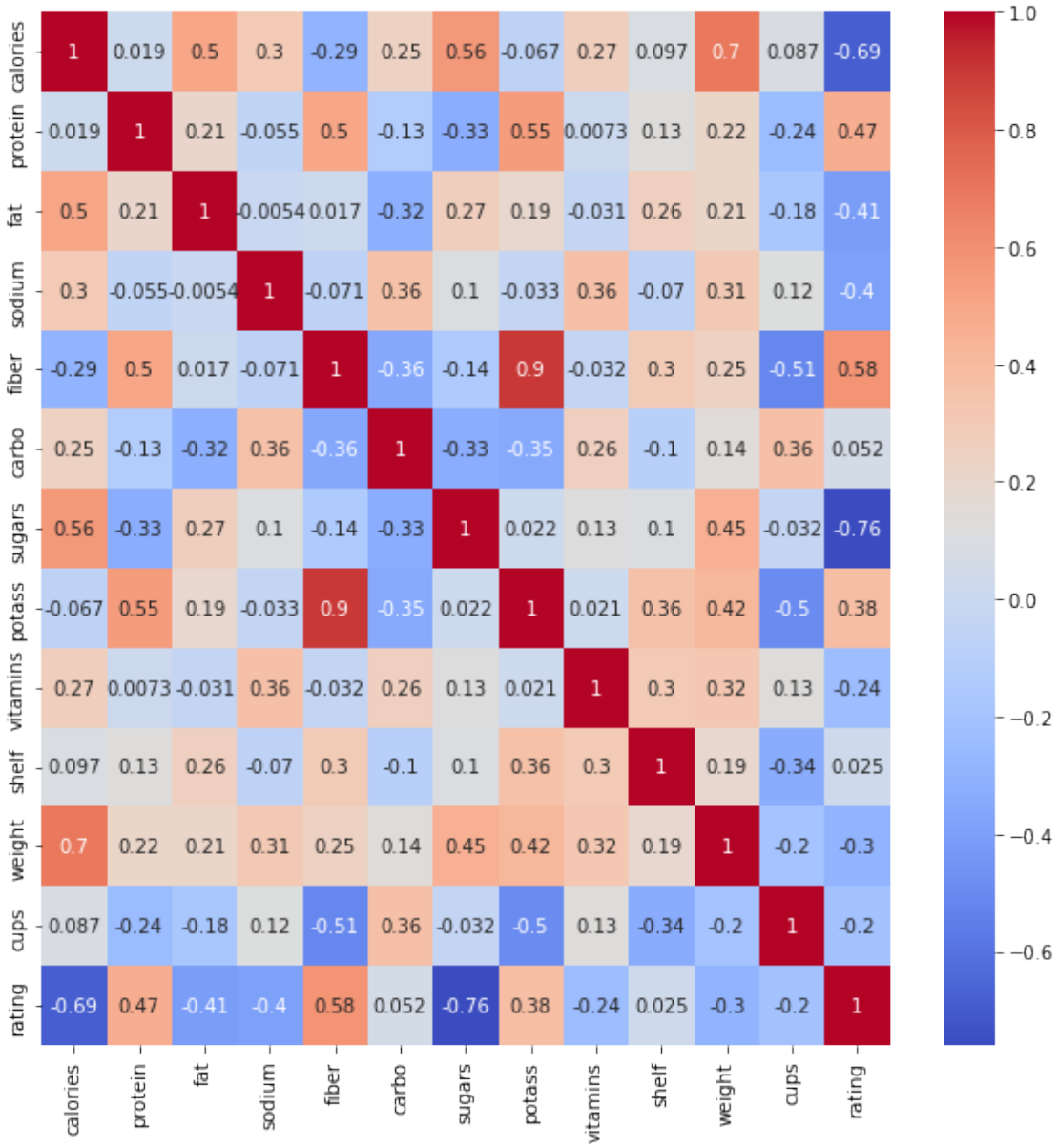
[29]:
```
<AxesSubplot: title={'center': 'Relationship between Sugar Content and Rating'},
xlabel='fat', ylabel='rating'>
```

[31]:
```
import pandas as pd
from sklearn.ensemble import RandomForestRegressor

# Assuming you have already loaded your DataFrame 'df'
# Drop non-numerical features for X
X = df.drop(columns=['name', 'type', 'mfr', 'rating', 'shelf', 'cups',
'weight'])

# Assign the target variable y as 'rating'
y = df['rating']

# Fit the RandomForestRegressor model
model = RandomForestRegressor()
model.fit(X, y)

# Extract feature importances
feature_importances = model.feature_importances_
```

[32]:
```
plt.figure(figsize=(10, 6))
sns.barplot(x=feature_importances, y=X.columns)
plt.xlabel("Feature Importance")
plt.ylabel("Features")
plt.title("Feature Importances")
plt.show()
```

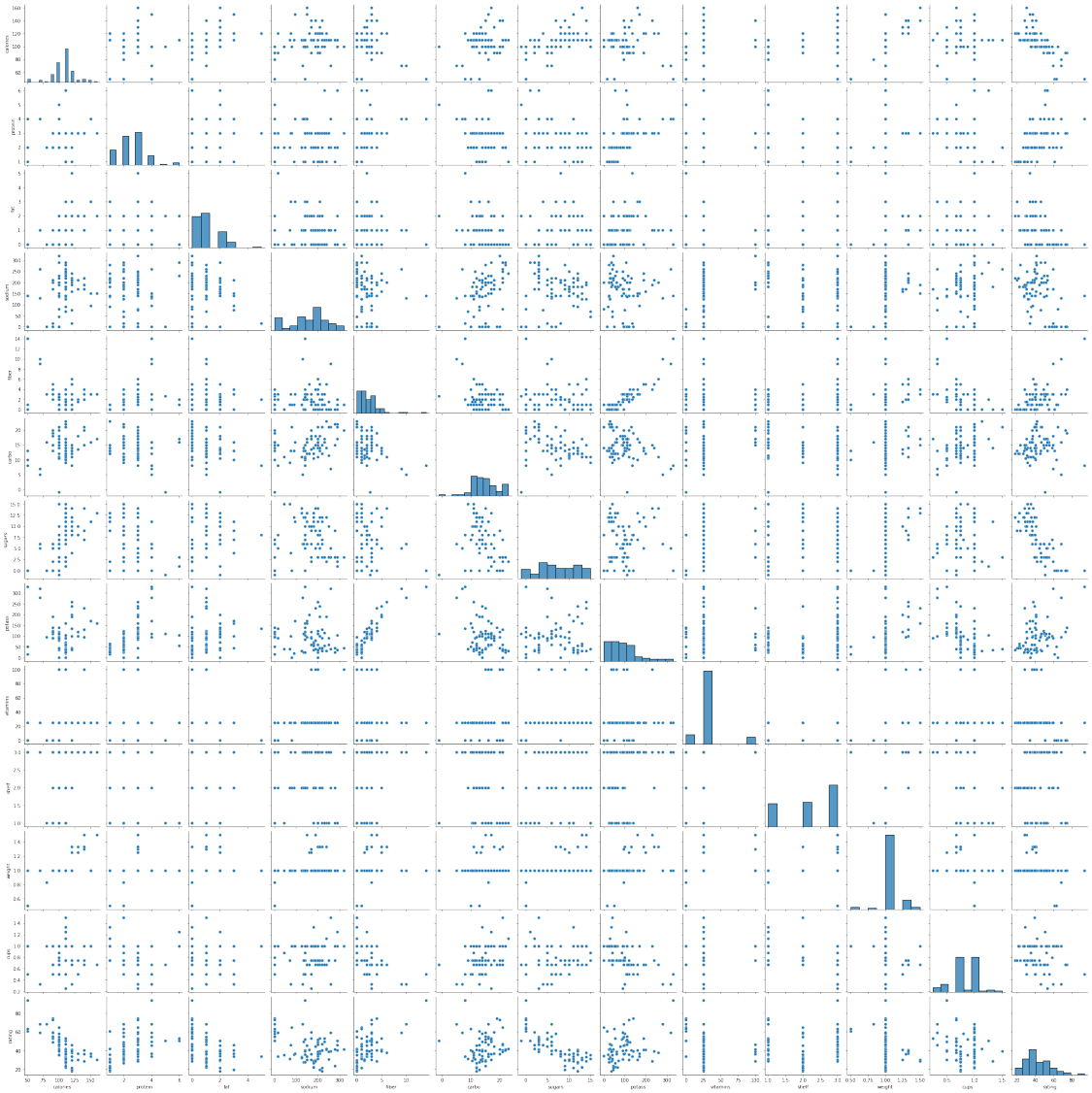


[34]:
```
fig, ax = plt.subplots(figsize=(10, 10))
num=['calories','protein','fat','sodium','fiber','carbo','sugars','potass','vitamins','shelf',
sns.heatmap(df[num].corr(), annot=True, cmap='coolwarm',ax=ax)
plt.show()
```



[35]:
```
sns.pairplot(df)
```

[35]: <seaborn.axisgrid.PairGrid at 0x7f2d87f4bc40>


calories
protein
fat
sodium
fiber
carbo
sugars
potass
vitamins
shelf
weight
cups
rating

[ ]: