In [2]:

```
import pandas as pd
import matplotlib.pyplot as plt
from IPython.display import display
import seaborn as sns
```

In [3]:

```
pd_city = pd.read_csv("./city_data.csv")
pd_city.head(5)
```

Out[3]:

	city	driver_count	type
0	Richardfort	38	Urban
1	Williamsstad	59	Urban
2	Port Angela	67	Urban
3	Rodneyfort	34	Urban
4	West Robert	39	Urban

In [4]:

```
pd_city.dtypes
```

Out[4]:

```
city            object
driver_count     int64
type            object
dtype: object
```

In [5]:

```
pd_ride = pd.read_csv("./ride_data.csv")
pd_ride.head(5)
```

Out[5]:

	city	date	fare	ride_id
0	Lake Jonathanshire	2018-01-14 10:14:22	13.83	5739410935873
1	South Michelleport	2018-03-04 18:24:09	30.24	2343912425577
2	Port Samanthamouth	2018-02-24 04:29:00	33.44	2005065760003
3	Rodneyfort	2018-02-10 23:22:03	23.44	5149245426178
4	South Jack	2018-03-06 04:28:35	34.58	3908451377344

In [6]:

```
pd_ride.dtypes
```

Out[6]:

```
city        object
date        object
fare       float64
ride_id      int64
dtype: object
```

In [7]:

```
pd_join = pd_city.join(pd_ride.set_index("city"),on="city")
pd_join['type'].unique()
```

Out[7]:

```
array(['Urban', 'Suburban', 'Rural'], dtype=object)
```

In [8]:

```
pd_join[pd_join['city']=='Amandaburgh']
```

Out[8]:

	city	driver_count	type	date	fare	ride_id
61	Amandaburgh	12	Urban	2018-03-05 02:15:38	26.28	906850928986
61	Amandaburgh	12	Urban	2018-02-24 23:10:49	43.66	6573820412437
61	Amandaburgh	12	Urban	2018-02-10 20:42:46	36.17	6455620849753
61	Amandaburgh	12	Urban	2018-01-11 02:22:07	29.24	7279902884763
61	Amandaburgh	12	Urban	2018-01-21 04:12:54	9.26	5528427024492
61	Amandaburgh	12	Urban	2018-04-19 16:30:12	6.27	4400632718421
61	Amandaburgh	12	Urban	2018-03-20 07:40:33	27.45	3701008274871
61	Amandaburgh	12	Urban	2018-04-01 09:24:21	24.29	1995462170530
61	Amandaburgh	12	Urban	2018-04-20 02:16:07	16.27	3513123734716
61	Amandaburgh	12	Urban	2018-03-13 12:52:31	13.88	6222134922674
61	Amandaburgh	12	Urban	2018-04-22 21:34:17	42.52	1901157522591
61	Amandaburgh	12	Urban	2018-02-06 10:02:30	11.93	7550325158038
61	Amandaburgh	12	Urban	2018-04-24 08:02:27	14.55	7836117055007
61	Amandaburgh	12	Urban	2018-04-05 10:22:33	25.55	8581415267582
61	Amandaburgh	12	Urban	2018-03-07 02:26:33	18.76	3419454549176
61	Amandaburgh	12	Urban	2018-01-02 09:57:04	33.06	6330658179518
61	Amandaburgh	12	Urban	2018-01-13 16:04:10	23.35	9975084532253
61	Amandaburgh	12	Urban	2018-01-29 23:28:12	41.06	4296858665195

In [9]:

```
pd_group = pd.DataFrame(data=list(pd_join.groupby(by='city').mean()['fare']),columns=['Average Fare

type(pd_join.groupby(by='city').mean()['fare'])
pd_group['city'] = pd_join.groupby(by='city').indices
a = pd_join.groupby(by='city').count()['driver_count']
pd_group['Number of Drivers'] = list(pd_join.groupby(by='city').count()['driver_count'])
pd_group['Number of Rides'] =pd_group['Number of Drivers']
pd_group.set_index('city')
#pd_group.set_index('city')
#pd_group() why re set_index in other cell
```

Out[9]:

city	Average Fare	Number of Drivers	Number of Rides
Amandaburgh	24.641667	18	18
Barajasview	25.332273	22	22
Barronchester	36.422500	16	16
Bethanyland	32.956111	18	18
Bradshawfurt	40.064000	10	10
Brandonfort	35.437368	19	19
Carriemouth	28.314444	27	27
Christopherfurt	24.501852	27	27
Colemanland	30.894545	22	22
Davidfurt	31.995882	17	17
Deanville	25.842632	19	19
East Aaronbury	25.661111	9	9
East Danielview	31.560588	17	17
East Kaylahaven	23.757931	29	29
East Kentstad	29.823077	13	13
East Marymouth	30.835185	27	27
Erikaland	24.906667	12	12
Garzaport	24.123333	3	3
Grahamburgh	25.221200	25	25
Grayville	27.763333	15	15
Harringtonfort	33.470000	6	6
Huntermouth	28.993750	24	24
Hurleymouth	25.891429	28	28
Jerryton	25.649200	25	25
Jessicaport	36.013333	6	6
Johnton	26.785714	21	21

city	Average Fare	Number of Drivers	Number of Rides
Joneschester	22.289600	25	25
Josephside	32.858148	27	27
Justinberg	23.694333	30	30
Karenberg	26.340000	17	17
...	...	...	...
South Evanton	26.726129	31	31
South Jack	22.965263	19	19
South Jennifer	35.264286	7	7
South Karenland	26.535526	38	38
South Latoya	20.093158	19	19
South Marychester	41.870000	8	8
South Michelleport	24.451613	31	31
South Phillip	28.571290	31	31
South Saramouth	36.160000	4	4
South Teresa	31.220455	22	22
Taylorhaven	42.263333	6	6
Valentineton	24.636364	22	22
Veronicaberg	32.828235	17	17
Victoriaport	27.780000	14	14
West Angela	25.990000	39	39
West Anthony	24.736667	30	30
West Christopherberg	24.421154	26	26
West Ericstad	22.347222	18	18
West Gabriel	20.346087	23	23
West Hannah	29.547619	21	21
West Heather	33.890000	9	9
West Heidi	23.133929	28	28
West Josephberg	21.720385	26	26
West Kimmouth	29.871500	20	20
West Patrickchester	28.233125	16	16
West Robert	25.123871	31	31
West Samuelburgh	21.767600	25	25
Williamsonville	31.875000	14	14
Williamsstad	24.362174	23	23
Williamsview	26.599000	20	20

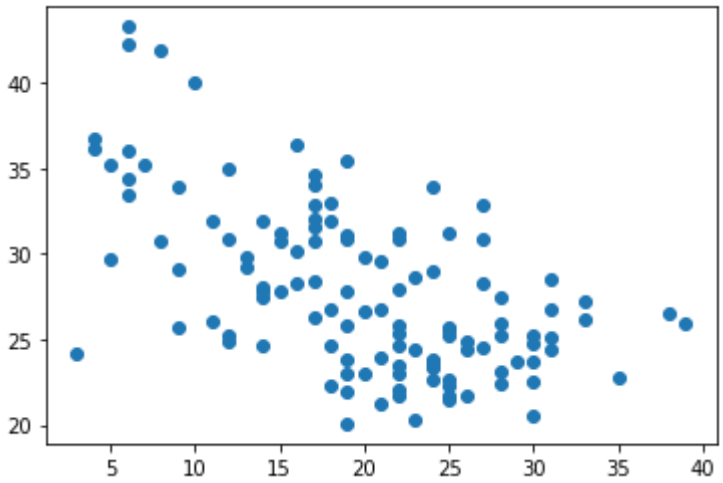
120 rows × 3 columns

In [10]:

```
plt.scatter(list(pd_group['Number of Drivers']),list(pd_group['Average Fare']))
```

Out[10]:

<matplotlib.collections.PathCollection at 0x268db365710>



In [11]:

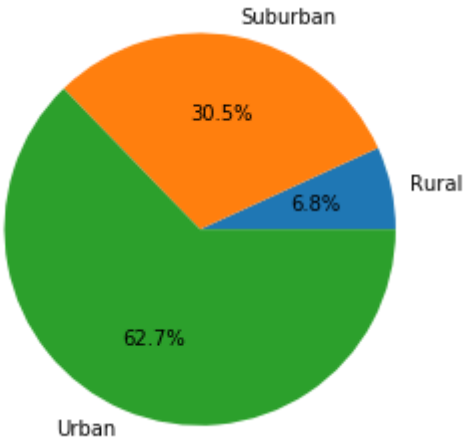
```
pd_join.groupby(by='type').sum()
```

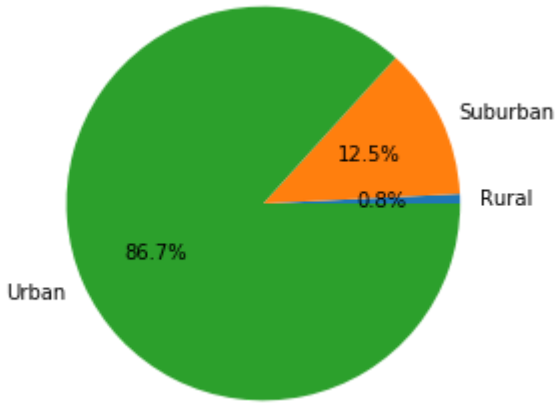
Out[11]:

type	driver_count	fare	ride_id
Rural	537	4327.93	580968240341287
Suburban	8570	19356.33	3106884522576766
Urban	59602	39854.38	7919412664056093

In [12]:

```
fig,axe1 = plt.subplots()
total_fare_index = pd_join.groupby(by='type').sum()['fare'].index
total_fare_value = list(pd_join.groupby(by='type').sum()['fare'])
axe1.pie(total_fare_value,labels=total_fare_index,autopct='%1.1f%%')
axe1.axis('equal')
total_ride_index = pd_join.groupby(by='type').sum()['driver_count'].index
total_ride_value = list(pd_join.groupby(by='type').sum()['driver_count'])
fig,axe2 = plt.subplots()
axe2.pie(total_ride_value,labels=total_ride_index,autopct='%1.1f%%')
axe2.axis('equal')
plt.show()
```





In [30]:

```
#t = sns.load_dataset("titanic") why "" not working
t = sns.load_dataset('titanic')
#len(t.index)
t.head(10)
```

Out[30]:

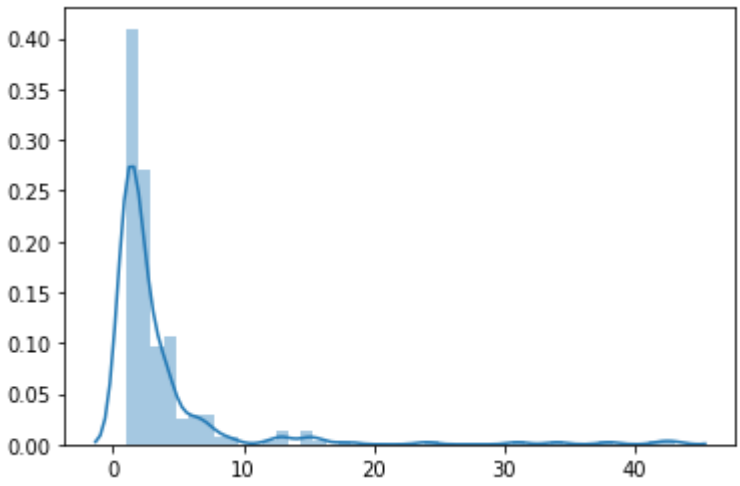
	survived	pclass	sex	age	sibsp	parch	fare	embarked	class	who	adult_mal
0	0	3	male	22.0	1	0	7.2500	S	Third	man	Tru
1	1	1	female	38.0	1	0	71.2833	C	First	woman	Fals
2	1	3	female	26.0	0	0	7.9250	S	Third	woman	Fals
3	1	1	female	35.0	1	0	53.1000	S	First	woman	Fals
4	0	3	male	35.0	0	0	8.0500	S	Third	man	Tru
5	0	3	male	NaN	0	0	8.4583	Q	Third	man	Tru
6	0	1	male	54.0	0	0	51.8625	S	First	man	Tru
7	0	3	male	2.0	3	1	21.0750	S	Third	child	Fals
8	1	3	female	27.0	0	2	11.1333	S	Third	woman	Fals
9	1	2	female	14.0	1	0	30.0708	C	Second	child	Fals

In [49]:

```
fare_pd = pd.DataFrame()
fare_pd['fare']= t.groupby('fare').indices
fare_pd['count']= t.groupby('fare').count()['sex']
fare_pd.set_index('fare',inplace=True,drop=True)
#type(fare_pd)
#fare_pd
#t.groupby('fare').count().head(3)
sns.distplot(fare_pd)
```

Out[49]:

```
<matplotlib.axes._subplots.AxesSubplot at 0x268e653a978>
```

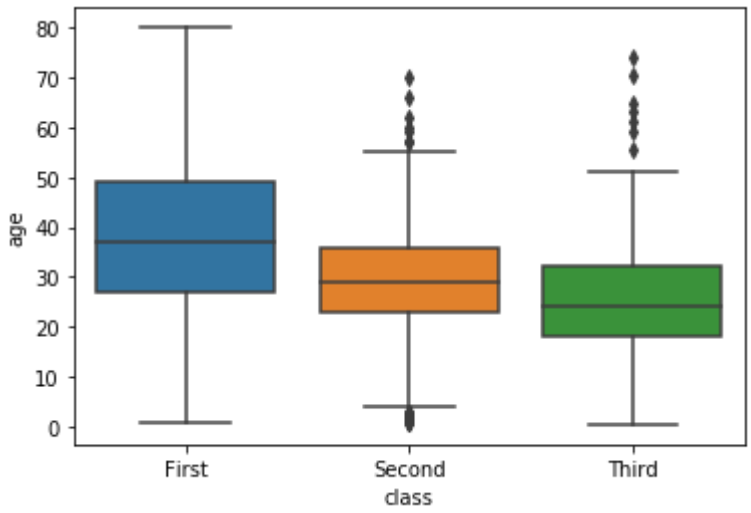


In [51]:

```
sns.boxplot(x='class',y='age',data=t)
```

Out[51]:

<matplotlib.axes._subplots.AxesSubplot at 0x268e6679c18>



In [76]:

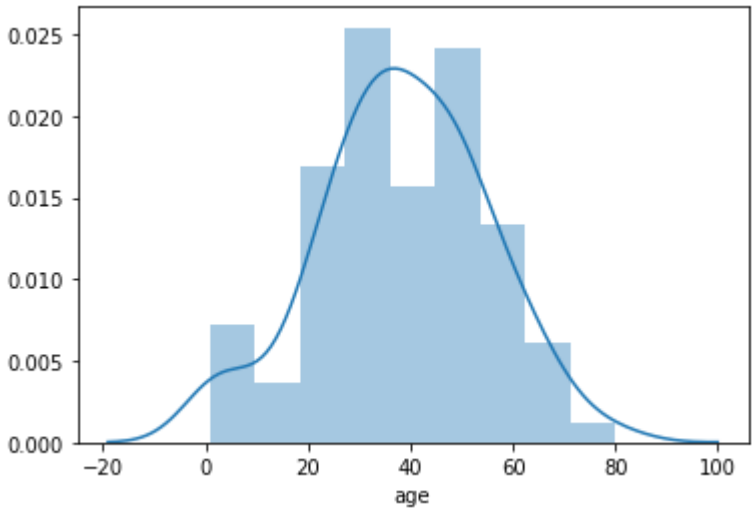
```
male_pd = t[t['sex']=='male']
male_pd.head(5)
male_pd.dropna(inplace=True)
male_pd['age']
#male_pd.groupby('age').count()
#male_pd['age']<=80
sns.distplot(male_pd['age'])
```

```
E:\software\anaconda\lib\site-packages\ipykernel_launcher.py:3: SettingWithCopyWarni
ng:
A value is trying to be set on a copy of a slice from a DataFrame

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stable/in
dexing.html#indexing-view-versus-copy (http://pandas.pydata.org/pandas-docs/stable/i
ndexing.html#indexing-view-versus-copy)
  This is separate from the ipykernel package so we can avoid doing imports until
```

Out[76]:

```
<matplotlib.axes._subplots.AxesSubplot at 0x268e6981c50>
```



In [79]:

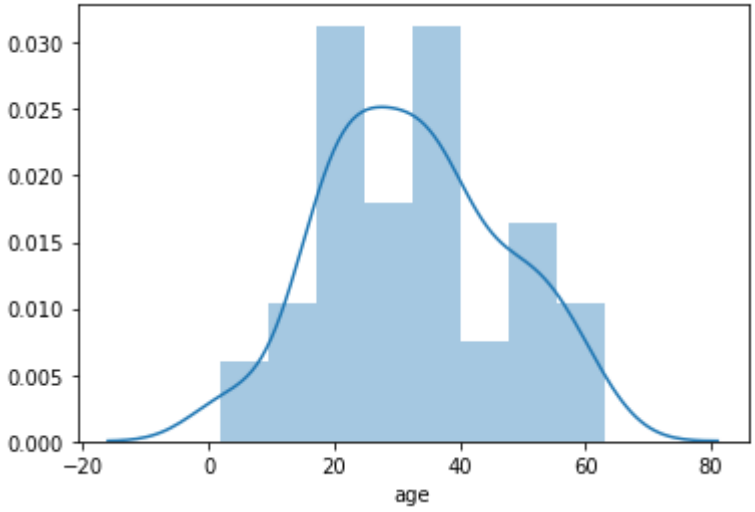
```
female_pd = t[t['sex']=='female']
female_pd.dropna(inplace=True)
#female_pd['age']
#male_pd.groupby('age').count()
#male_pd['age']<=80
sns.distplot(female_pd['age'])
```

```
E:\software\anaconda\lib\site-packages\ipykernel_launcher.py:2: SettingWithCopyWarni
ng:
A value is trying to be set on a copy of a slice from a DataFrame

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stable/in
dexing.html#indexing-view-versus-copy (http://pandas.pydata.org/pandas-docs/stable/i
ndexing.html#indexing-view-versus-copy)
```

Out[79]:

```
<matplotlib.axes._subplots.AxesSubplot at 0x268e6a06438>
```

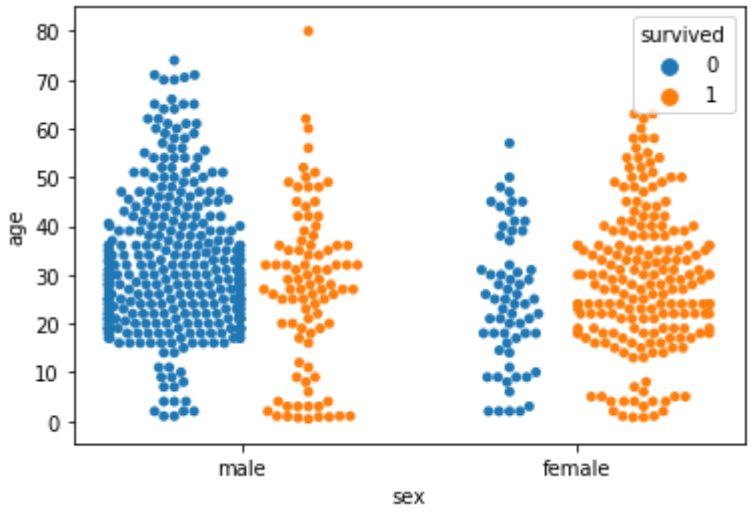


In [82]:

```
sns.swarmplot(x='sex',y='age',hue='survived',dodge=True,data=t)
```

Out[82]:

<matplotlib.axes._subplots.AxesSubplot at 0x268e6beb400>



In [78]:

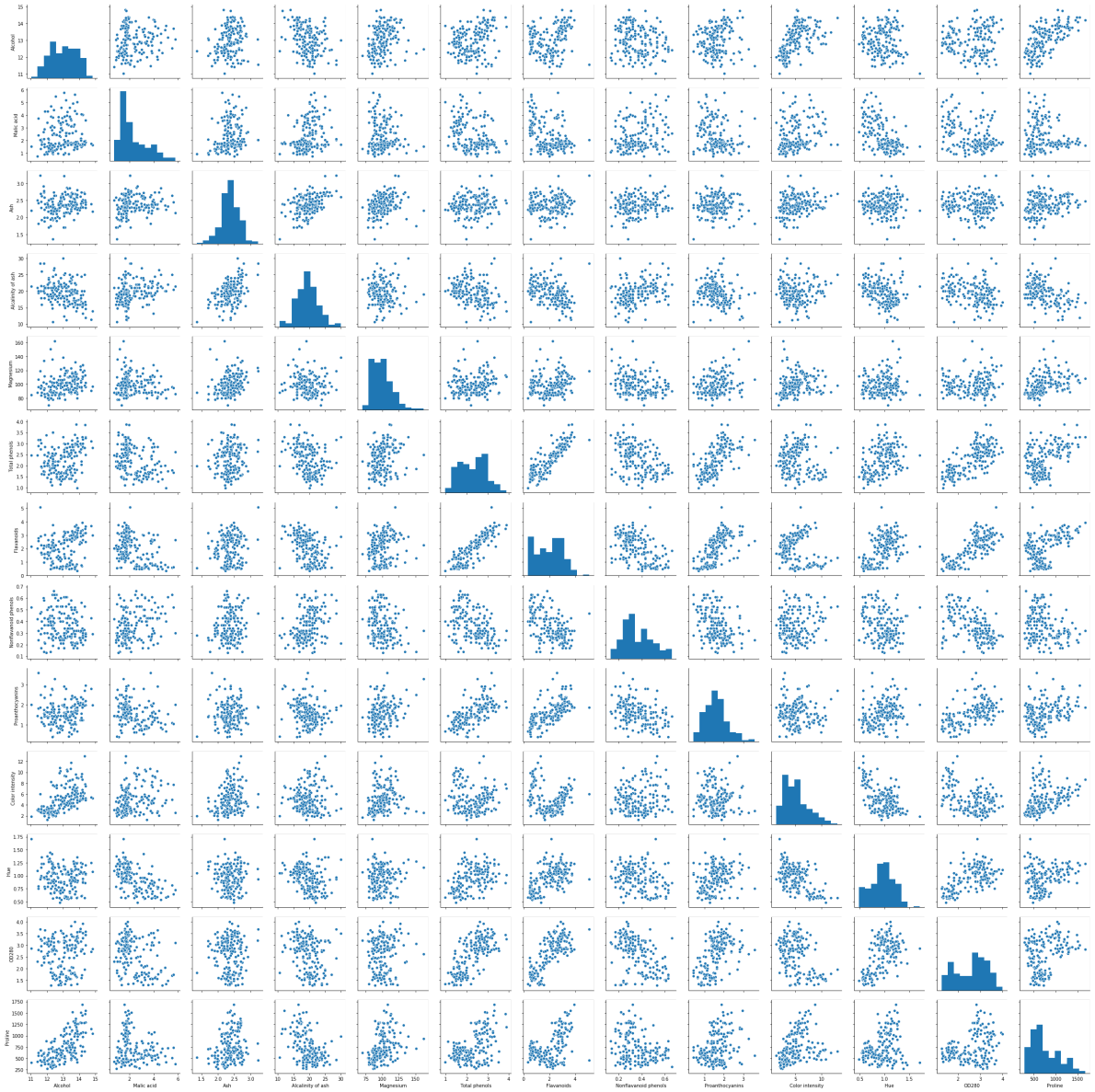
```
wine_pd = pd.read_csv("./wine_data.csv")
#wine_pd.head()
wine_pd['Label'].unique()
labels = wine_pd['Label']
labels
wine_pd = wine_pd.drop(axis=1,columns='Label')
wine_pd.head(5)
```

Out[78]:

	Alcohol	Malic acid	Ash	Alcalinity of ash	Magnesium	Total phenols	Flavanoids	Nonflavanoid phenols	Proanthocya
0	14.23	1.71	2.43	15.6	127	2.80	3.06	0.28	
1	13.20	1.78	2.14	11.2	100	2.65	2.76	0.26	
2	13.16	2.36	2.67	18.6	101	2.80	3.24	0.30	
3	14.37	1.95	2.50	16.8	113	3.85	3.49	0.24	
4	13.24	2.59	2.87	21.0	118	2.80	2.69	0.39	

In [14]:

```
sns_plot = sns.pairplot(wine_pd,diag_kind="hist")
```

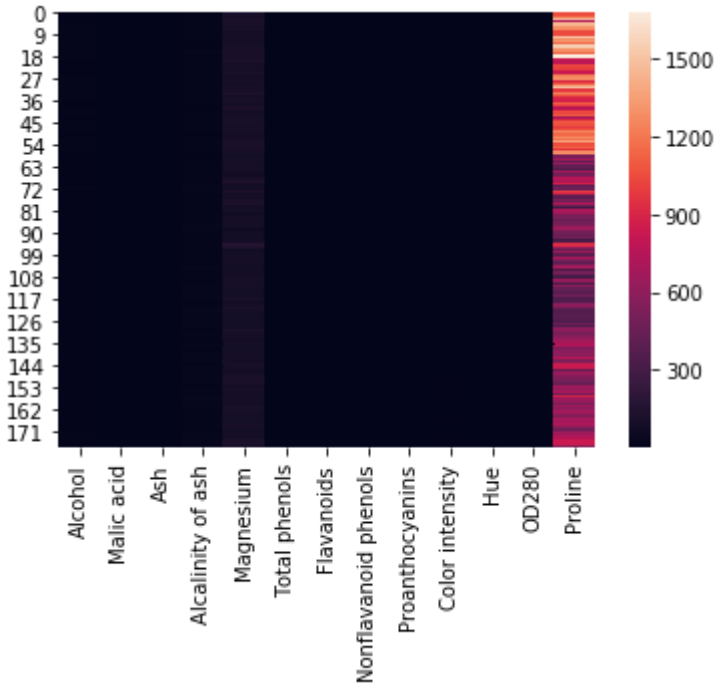


In [15]:

```
#plt.subplots(figsize=(100,100))
sns.heatmap(wine_pd)
```

Out[15]:

<matplotlib.axes._subplots.AxesSubplot at 0x268e1e7a080>



In [16]:

```
from sklearn import preprocessing
from sklearn.cluster import KMeans
```

In [17]:

```
standardScaler = preprocessing.StandardScaler()
standardScaler.fit(wine_pd)
X_scaled_array = standardScaler.transform(wine_pd)
X_scaled_array
#normalizedData = pd.DataFrame(X_scaled_array, columns = wine_pd.columns)
#normalizedData.head(5)
#len(normalizedData.index)
```

Out[17]:

```
array([[ 1.51861254, -0.5622498 ,  0.23205254, ...,  0.36217728,
         1.84791957,  1.01300893],
       [ 0.24628963, -0.49941338, -0.82799632, ...,  0.40605066,
         1.1134493 ,  0.96524152],
       [ 0.19687903,  0.02123125,  1.10933436, ...,  0.31830389,
         0.78858745,  1.39514818],
       ...,
       [ 0.33275817,  1.74474449, -0.38935541, ..., -1.61212515,
        -1.48544548,  0.28057537],
       [ 0.20923168,  0.22769377,  0.01273209, ..., -1.56825176,
        -1.40069891,  0.29649784],
       [ 1.39508604,  1.58316512,  1.36520822, ..., -1.52437837,
        -1.42894777, -0.59516041]])
```

In [18]:

```
kMeansClustering = KMeans(n_clusters = 3)
res = kMeansClustering.fit_predict(normalizedData)
res
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
<ipython-input-18-6005a674d9fd> in <module>
      1 kMeansClustering = KMeans(n_clusters = 3)
----> 2 res = kMeansClustering.fit_predict(normalizedData)
      3 res

NameError: name 'normalizedData' is not defined
```

In [ ]:

```
normalizedData['cluster'] = res
normalizedData.head(3)
```

In [ ]:

```
sns_plot = sns.pairplot(normalizedData, hue = "cluster",diag_kind="hist")
```