```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import warnings
warnings.filterwarnings('ignore')

df = pd.read_csv("/Users/aaryanbabuta/Documents/Prodigy DS Internship
June 2024/bank+marketing/bank/bank.csv",delimiter=';')
df.head()
```

```
   age          job  marital  education default  balance housing loan
\
0   30   unemployed  married    primary      no     1787      no   no

1   33     services  married  secondary      no     4789     yes  yes

2   35   management   single   tertiary      no     1350     yes   no

3   30   management  married   tertiary      no     1476     yes  yes

4   59  blue-collar  married  secondary      no        0     yes   no


    contact  day month  duration  campaign  pdays  previous poutcome
y
0  cellular   19   oct        79         1     -1         0  unknown
no
1  cellular   11   may       220         1    339         4  failure
no
2  cellular   16   apr       185         1    330         1  failure
no
3   unknown    3   jun       199         4     -1         0  unknown
no
4   unknown    5   may       226         1     -1         0  unknown
no
```

```
df.tail()
```

```
      age            job  marital  education default  balance housing
loan  \
4516   33       services  married  secondary      no     -333     yes
no
4517   57  self-employed  married   tertiary     yes    -3313     yes
yes
4518   57     technician  married  secondary      no      295      no
no
4519   28    blue-collar  married  secondary      no     1137      no
no
4520   44   entrepreneur   single   tertiary      no     1136     yes
yes
```

```
       contact  day month  duration  campaign  pdays  previous
poutcome   y
4516  cellular   30   jul       329         5     -1         0
unknown  no
4517   unknown    9   may       153         1     -1         0
unknown  no
4518  cellular   19   aug       151        11     -1         0
unknown  no
4519  cellular    6   feb       129         4    211         3
other  no
4520  cellular    3   apr       345         2    249         7
other  no
```

```
df.shape
```

```
(4521, 17)
```

```
df.columns
```

```
Index(['age', 'job', 'marital', 'education', 'default', 'balance',
'housing',
       'loan', 'contact', 'day', 'month', 'duration', 'campaign',
'pdays',
       'previous', 'poutcome', 'y'],
      dtype='object')
```

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 4521 entries, 0 to 4520
Data columns (total 17 columns):
 #   Column     Non-Null Count  Dtype
---  ------     --------------  -----
 0   age        4521 non-null   int64
 1   job        4521 non-null   object
 2   marital    4521 non-null   object
 3   education  4521 non-null   object
 4   default    4521 non-null   object
 5   balance    4521 non-null   int64
 6   housing    4521 non-null   object
 7   loan       4521 non-null   object
 8   contact    4521 non-null   object
 9   day        4521 non-null   int64
 10  month      4521 non-null   object
 11  duration   4521 non-null   int64
 12  campaign   4521 non-null   int64
 13  pdays      4521 non-null   int64
 14  previous   4521 non-null   int64
 15  poutcome   4521 non-null   object
 16  y          4521 non-null   object
```

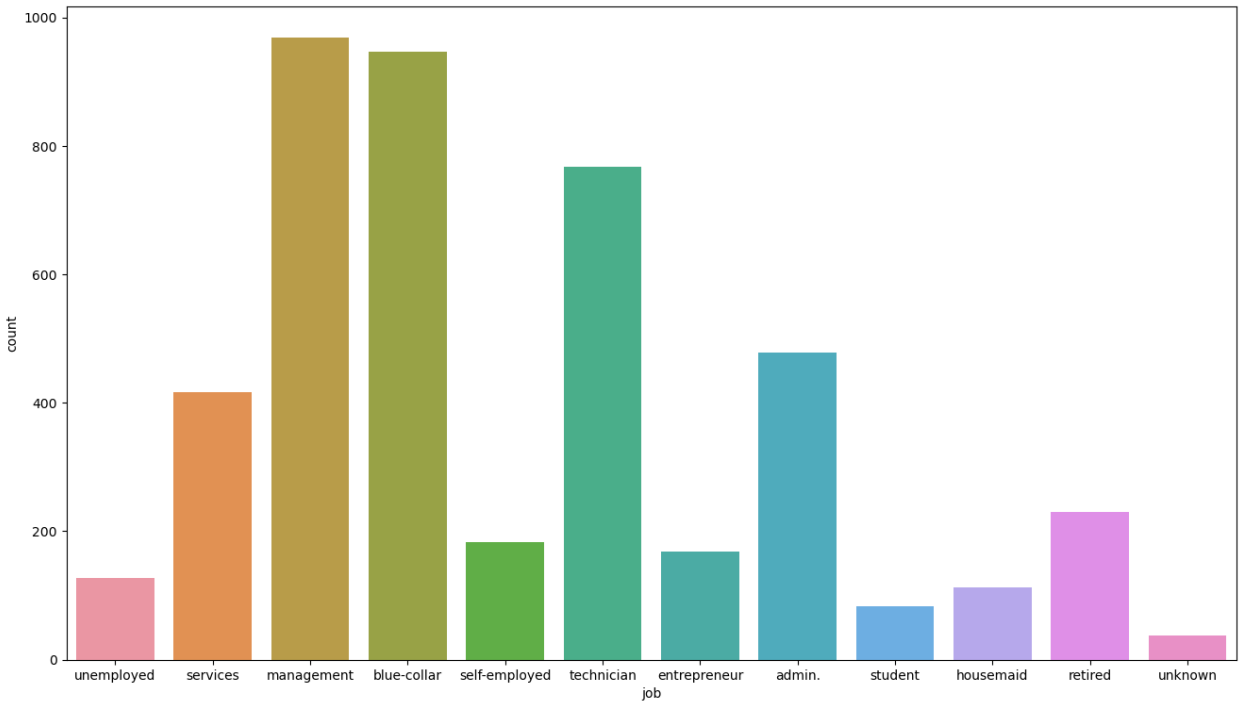
```
dtypes: int64(7), object(10)
memory usage: 600.6+ KB
```

```
df.isnull().sum().any()
```

```
False
```

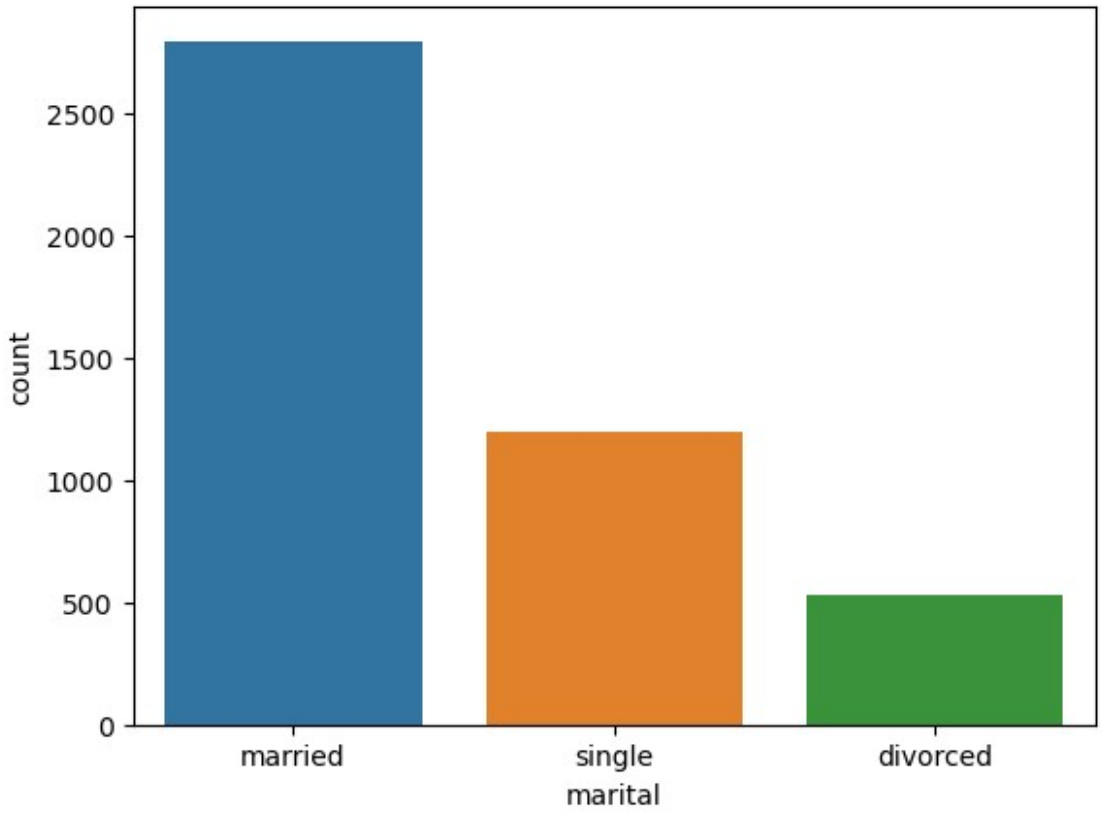
```
plt.figure(figsize = (16,9))
sns.countplot(x = "job",data = df)
```

```
<Axes: xlabel='job', ylabel='count'>
```



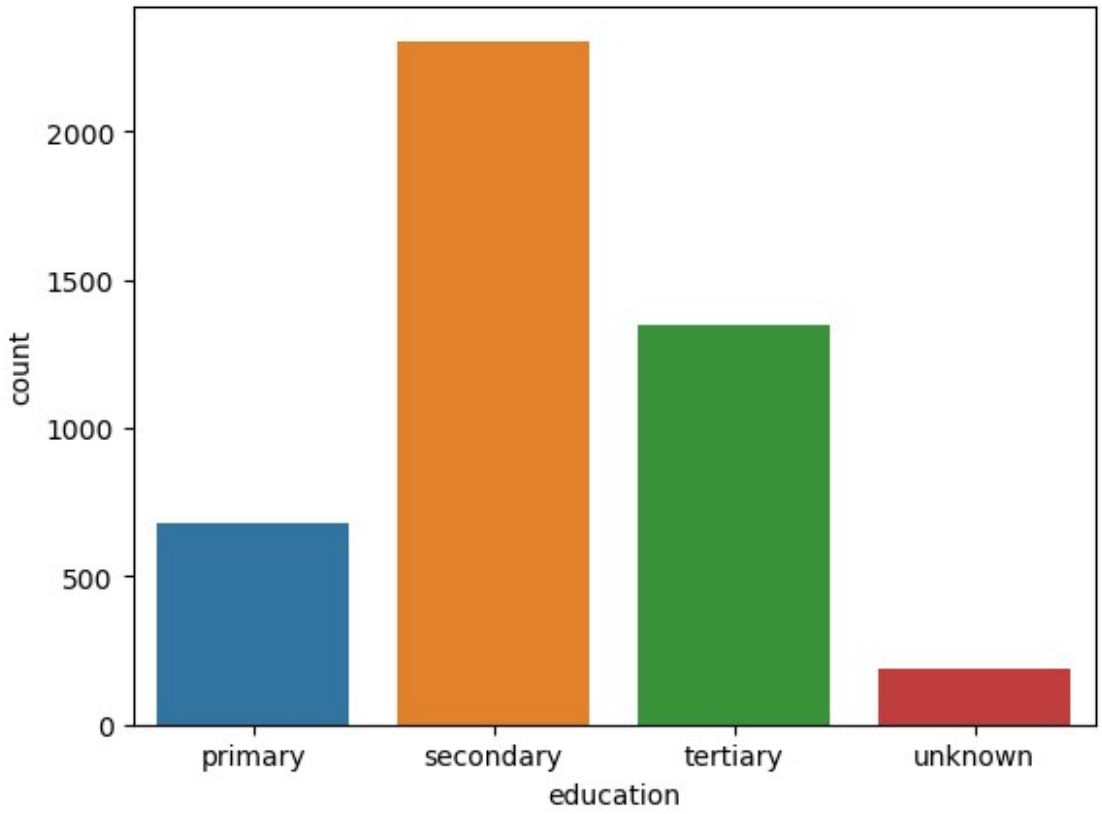

```
sns.countplot(x = "marital",data = df)
```

```
<Axes: xlabel='marital', ylabel='count'>
```



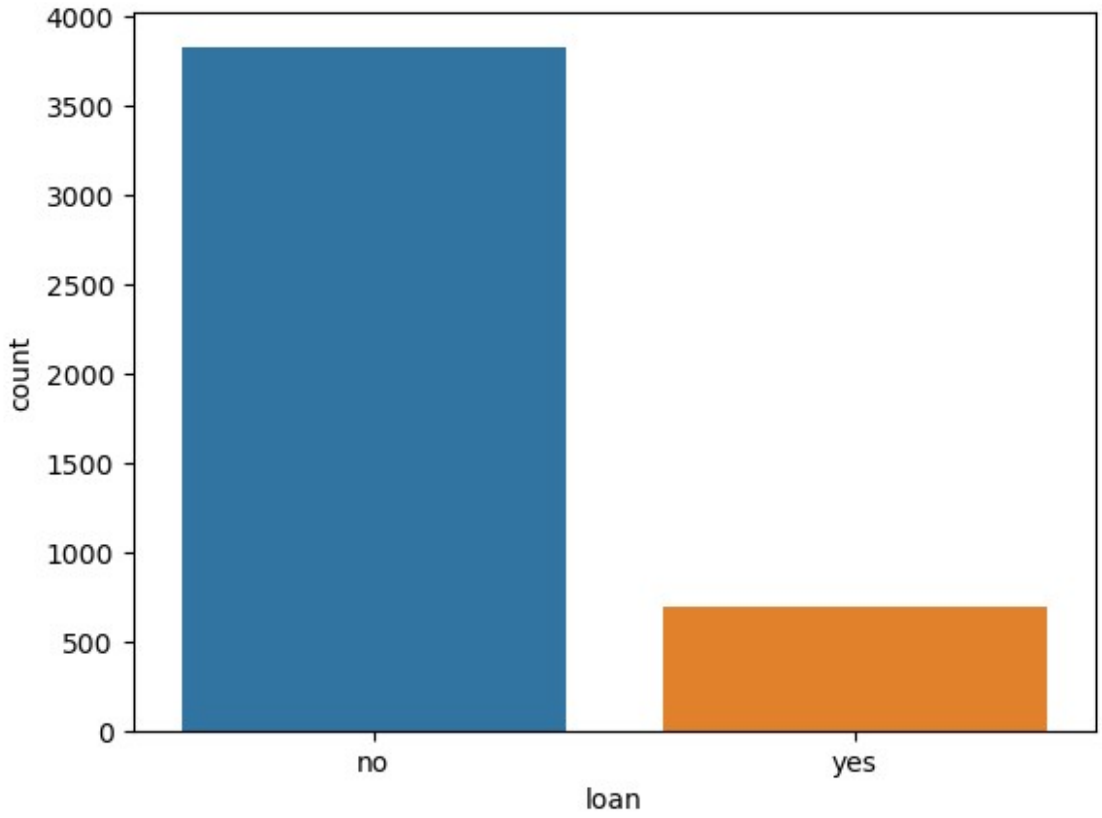

```
sns.countplot(x = "education",data = df)
```

```
<Axes: xlabel='education', ylabel='count'>
```



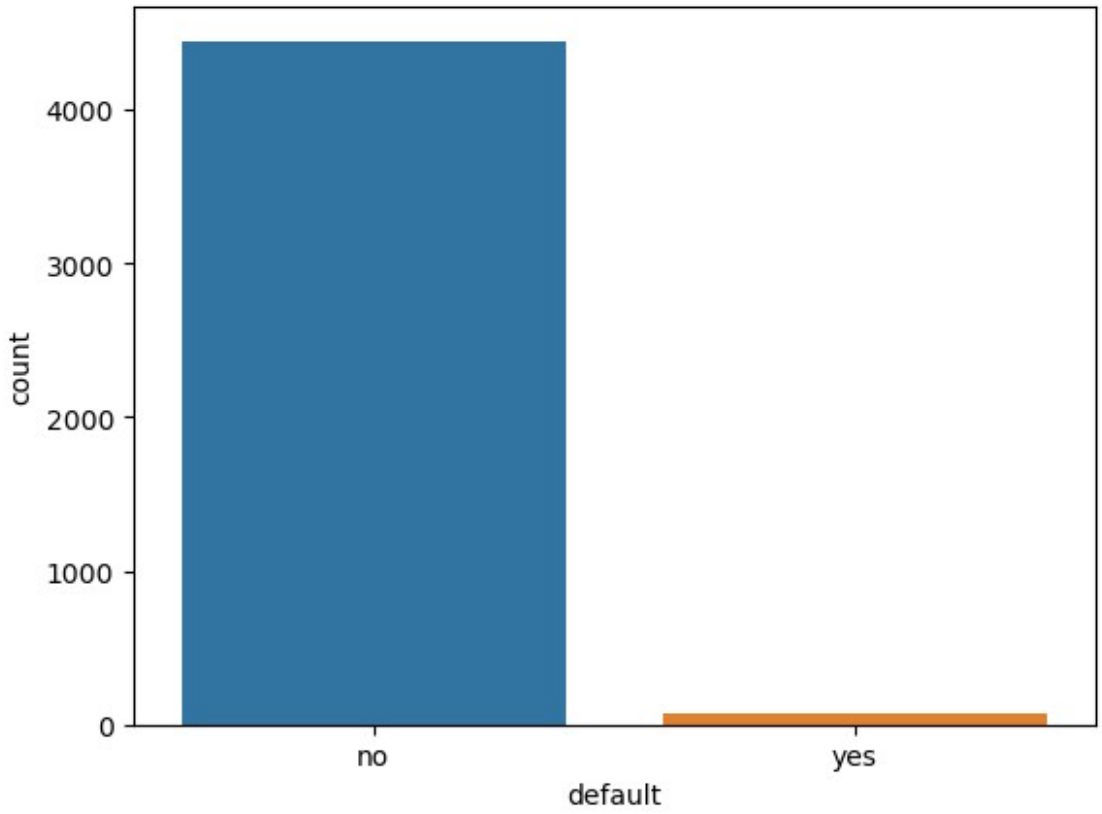

```
sns.countplot(x = "loan",data = df)
```

```
<Axes: xlabel='loan', ylabel='count'>
```




```
sns.countplot(x = "default",data = df)
```

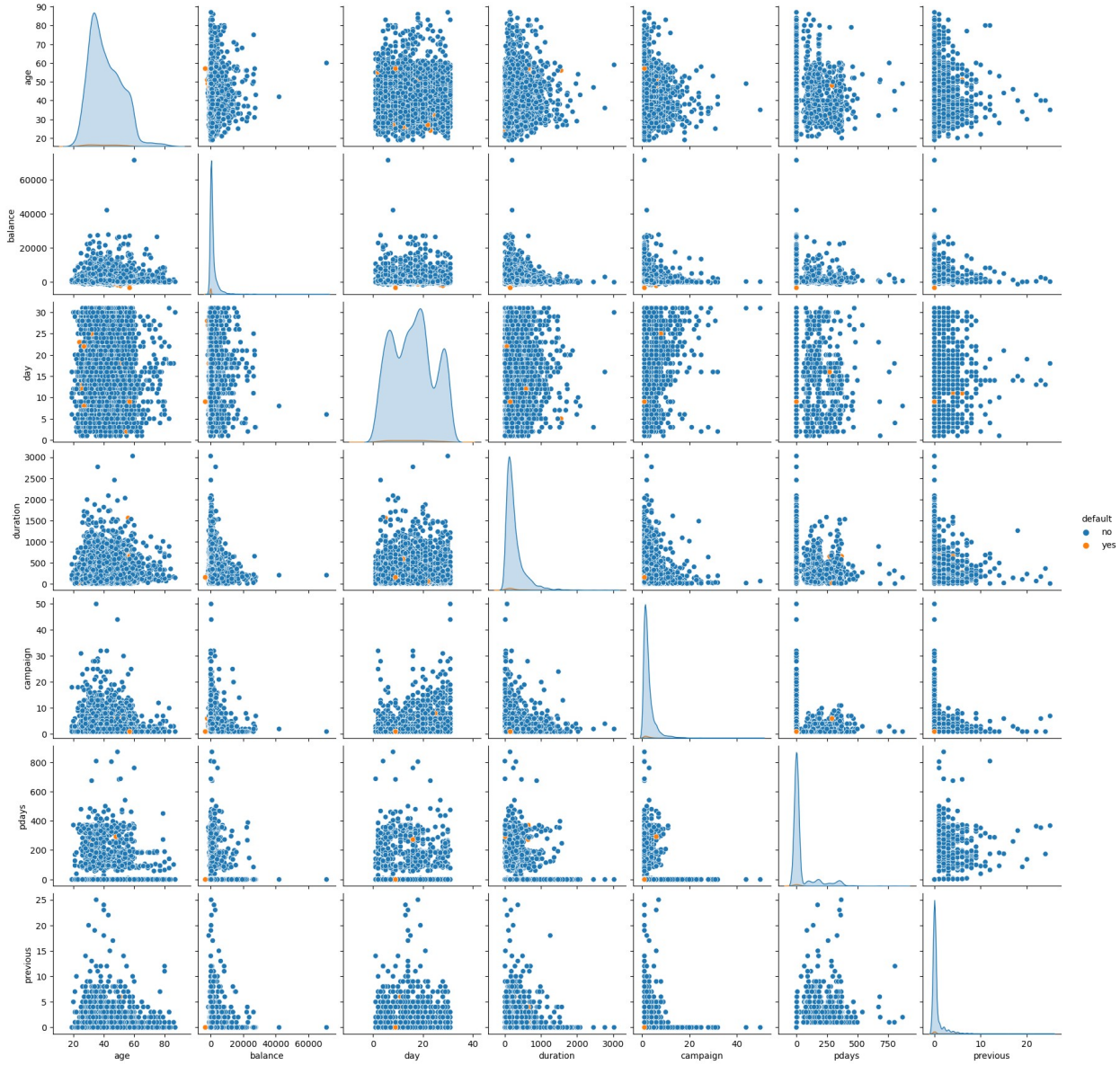
```
<Axes: xlabel='default', ylabel='count'>
```




```
plt.figure(figsize = (16,9))
sns.pairplot(data = df,hue = "default")
```

```
<seaborn.axisgrid.PairGrid at 0x172c105d0>
```

```
<Figure size 1600x900 with 0 Axes>
```


age
balance
day
duration
campaign
pdays
previous
default
no
yes