Day 13 | ML | Random - Sample - imputation | Numeric Data

Import Libraries

In [1]:
```
import numpy as np
import pandas as pd
from sklearn.model_selection import train_test_split
import matplotlib.pyplot as plt
import seaborn as sns
```

Import Dataset

In [2]:
```
df = pd.read_csv('train.csv',usecols=['Age','Fare','Survived'])
```

In [3]:
```
df.head()
```

Out[3]:

	Survived	Age	Fare
0	0	22.0	7.2500
1	1	38.0	71.2833
2	1	26.0	7.9250
3	1	35.0	53.1000
4	0	35.0	8.0500

Check missing (null) value

In [4]:
```
df.isnull().mean() * 100
```

Out[4]:
```
Survived     0.00000
Age         19.86532
Fare         0.00000
dtype: float64
```

Create X & Y

In [5]:
```
X = df.drop(columns=['Survived'])
y = df['Survived']
```

Apply Train Test Split

In [6]:
```
X_train,X_test,y_train,y_test = train_test_split(X,y,test_size=0.2,random_state=2)
```

In [9]:
```
X_train
```

Out[9]:

	Age	Fare
30	40.0	27.7208
10	4.0	16.7000
873	47.0	9.0000
182	9.0	31.3875
876	20.0	9.8458
...	...	...
534	30.0	8.6625
584	NaN	8.7125
493	71.0	49.5042
527	NaN	221.7792
168	NaN	25.9250

712 rows × 2 columns

New column create in Both Train & Test

In [10]:
```
X_train['Age_imputed'] = X_train['Age']
X_test['Age_imputed'] = X_test['Age']
```

In [11]:
```
X_test.tail()
```

Out[11]:

	Age	Fare	Age_imputed
89	24.0	8.0500	24.0
80	22.0	9.0000	22.0
846	NaN	69.5500	NaN
870	26.0	7.8958	26.0
251	29.0	10.4625	29.0

In [12]:
```
X_test.head()
```

Out[12]:

	Age	Fare	Age_imputed
707	42.0	26.2875	42.0
37	21.0	8.0500	21.0
615	24.0	65.0000	24.0
169	28.0	56.4958	28.0
68	17.0	7.9250	17.0

In [13]:
```
X_train.tail()
```

Out[13]:

	Age	Fare	Age_imputed
534	30.0	8.6625	30.0
584	NaN	8.7125	NaN
493	71.0	49.5042	71.0
527	NaN	221.7792	NaN
168	NaN	25.9250	NaN

In [14]:
```
X_train.head()
```

Out[14]:

	Age	Fare	Age_imputed
30	40.0	27.7208	40.0
10	4.0	16.7000	4.0
873	47.0	9.0000	47.0
182	9.0	31.3875	9.0
876	20.0	9.8458	20.0

Replace Value Age_imputed

In [15]:
```
X_train['Age_imputed'][X_train['Age_imputed'].isnull()] = X_train['Age'].dropna().sam
X_test['Age_imputed'][X_test['Age_imputed'].isnull()] = X_train['Age'].dropna().sampl
```

Review Sample Random Generate Value

In [16]:
```
X_train['Age'].dropna().sample(1).values
```

Out[16]:
```
array([65.])
```

In [17]:
```
X_train['Age'].isnull().sum()
```

Out[17]:
```
148
```

In [21]:
```
X_train['Age'].dropna().sample(X_train['Age'].isnull().sum()).values
```

Out[21]:
```
array([35.  , 62.  , 28.  , 24.  , 22.  , 23.  ,  9.  , 25.  , 24.  ,
        3.  , 36.  , 24.  , 40.  , 17.  , 28.  , 40.  , 26.  , 30.  ,
       43.  , 16.  , 39.  , 35.  , 24.  ,  4.  , 40.  , 42.  , 50.  ,
       31.  , 31.  ,  4.  ,  2.  , 42.  , 26.  , 21.  , 56.  , 45.  ,
        0.75, 14.  , 15.  , 38.  , 22.  , 36.  ,  4.  , 21.  , 20.  ,
       18.  ,  1.  , 24.  , 54.  , 23.  , 60.  , 17.  , 35.  , 50.  ,
        2.  , 36.  , 25.  , 14.  , 43.  , 17.  , 25.  , 28.  , 30.  ,
       29.  , 51.  , 16.  ,  9.  , 22.  , 50.  , 63.  , 56.  , 40.  ,
       30.  , 33.  , 31.  , 31.  , 36.  , 35.  ,  4.  , 54.  , 39.  ,
       39.  , 47.  , 16.  , 28.  , 16.  , 44.  , 50.  , 15.  , 21.  ,
       20.  , 61.  , 25.  , 46.  , 36.  , 27.  , 42.  , 18.  , 23.  ,
        3.  , 25.  , 14.  , 19.  , 21.  , 27.  , 25.  , 25.  , 19.  ,
       38.  , 23.  , 39.  , 43.  , 39.  , 52.  , 32.  , 48.  , 54.  ,
       24.  , 15.  , 18.  , 32.  , 44.  , 27.  , 56.  , 28.  ,  9.  ,
       58.  , 45.  , 48.  , 16.  , 24.  , 41.  , 25.  , 28.  , 16.  ,
       35.  , 20.  , 47.  , 20.  , 24.  , 19.  , 32.  , 64.  , 27.  ,
       33.  , 57.  , 41.  , 16.  ])
```

In [24]:
```
X_train
```

Out[24]:

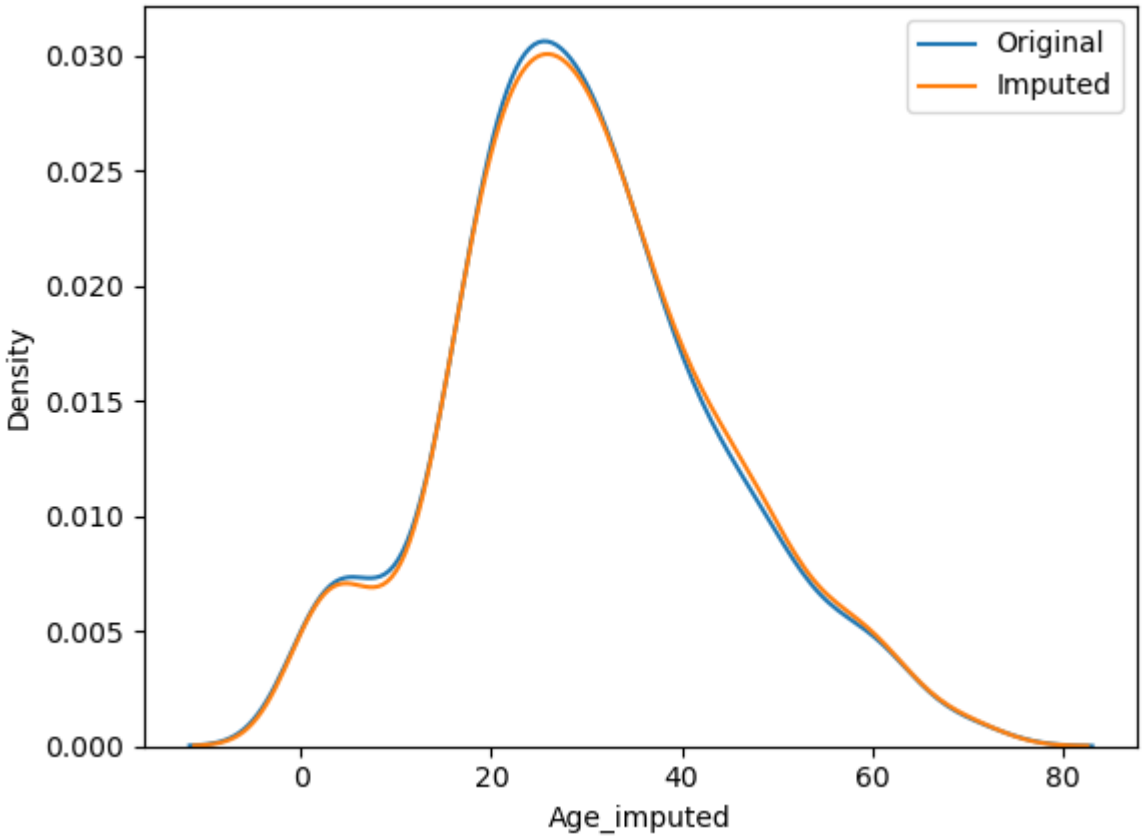
	Age	Fare	Age_imputed
30	40.0	27.7208	40.0
10	4.0	16.7000	4.0
873	47.0	9.0000	47.0
182	9.0	31.3875	9.0
876	20.0	9.8458	20.0
...	...	...	...
534	30.0	8.6625	30.0
584	NaN	8.7125	18.0
493	71.0	49.5042	71.0
527	NaN	221.7792	32.0
168	NaN	25.9250	24.0

712 rows × 3 columns

Compare Original Age and Imputed Age

In [25]:
```
sns.distplot(X_train['Age'],label='Original',hist=False)
sns.distplot(X_train['Age_imputed'],label = 'Imputed',hist=False)
plt.legend()
plt.show()
```

```
C:\Users\ASUS\AppData\Local\Temp\ipykernel_12888\2131456624.py:1: UserWarning:

`distplot` is a deprecated function and will be removed in seaborn v0.14.0.

Please adapt your code to use either `displot` (a figure-level function with
similar flexibility) or `kdeplot` (an axes-level function for kernel density plots).

For a guide to updating your code to use the new functions, please see
https://gist.github.com/mwaskom/de44147ed2974457ad6372750bbe5751 (https://gist.github.com/mwaskom/de44147ed2974457ad6372750bbe5751)

  sns.distplot(X_train['Age'],label='Original',hist=False)
C:\Users\ASUS\AppData\Local\Temp\ipykernel_12888\2131456624.py:2: UserWarning:

`distplot` is a deprecated function and will be removed in seaborn v0.14.0.

Please adapt your code to use either `displot` (a figure-level function with
similar flexibility) or `kdeplot` (an axes-level function for kernel density plots).

For a guide to updating your code to use the new functions, please see
https://gist.github.com/mwaskom/de44147ed2974457ad6372750bbe5751 (https://gist.github.com/mwaskom/de44147ed2974457ad6372750bbe5751)

  sns.distplot(X_train['Age_imputed'],label = 'Imputed',hist=False)
```



Compare Variable Variance

In [26]:
```
print('Original variable variance: ', X_train['Age'].var())
print('Variance after random imputation: ', X_train['Age_imputed'].var())
```

```
Original variable variance:  204.3495133904614
Variance after random imputation:  206.42663730700545
```

In [ ]: