How to Count Distinct Values of a Pandas Dataframe Column?

erakshaya485

Let's see How to Count Distinct Values of a Pandas Dataframe Column?

Consider a tabular structure as given below which has to be created as Dataframe. The columns are **height, weight and age**. The records of 8 students form the rows.

	height	weight	age
Steve	165	63.5	20
Ria	165	64	22
Nivi	164	63.5	22
Jane	158	54	21
Kate	167	63.5	23
Lucy	160	62	22
Ram	158	64	20
Niki	165	64	21

Python3


```
# import library
import pandas as pd

# create a Dataframe
df = pd.DataFrame({
  'height' : [165, 165, 164,
              158, 167, 160,
              158, 165],

  'weight' : [63.5, 64, 63.5,
              54, 63.5, 62,
              64, 64],

  'age' : [20, 22, 22,
           21, 23, 22,
           20, 21]},

   index = ['Steve', 'Ria', 'Nivi',
            'Jane', 'Kate', 'Lucy',
            'Ram', 'Niki'])

# show the Dataframe
df
```

Output:

	height	weight	age
Steve	165	63.5	20
Ria	165	64.0	22
Nivi	164	63.5	22
Jane	158	54.0	21
Kate	167	63.5	23
Lucy	160	62.0	22
Ram	158	64.0	20
Niki	165	64.0	21

Method 1: Using **for loop.**

The Dataframe has been created and one can hard coded using **for loop** and count the number of unique values in a specific column. For example In the above table, if one wishes to count the number of unique values in the column **height**. The idea is to use a variable **cnt** for storing the count and a list **visited** that has the previously visited values. Then for loop that iterates through the 'height' column and for each value, it checks whether the same value has already been visited in the visited list. If the value was not visited previously, then the count is incremented by 1.

Below is the implementation:

Python3

```
# import library
import pandas as pd
```

```
  'height' : [165, 165, 164,
              158, 167, 160,
              158, 165],

  'weight' : [63.5, 64, 63.5,
              54, 63.5, 62,
              64, 64],

  'age' : [20, 22, 22,
           21, 23, 22,
           20, 21]},

   index = ['Steve', 'Ria', 'Nivi',
            'Jane', 'Kate', 'Lucy',
            'Ram', 'Niki'])

# variable to hold the count
cnt = 0

# list to hold visited values
visited = []

# loop for counting the unique
# values in height
for i in range(0, len(df['height'])):

    if df['height'][i] not in visited:

        visited.append(df['height'][i])

        cnt += 1

print("No.of.unique values :",
      cnt)

print("unique values :",
      visited)
```

Output :

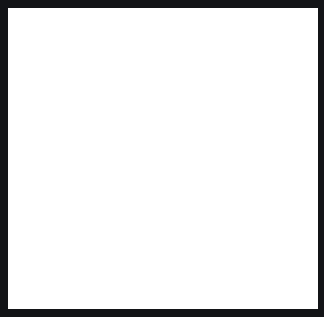
```
No.of.unique values : 5
unique values : [165, 164, 158, 167, 160]
```

But this method is not so efficient when the Dataframe grows in size and contains thousands of rows and columns. To give an efficient there are three methods available which are listed below:

- pandas.unique()

- **Series.value_counts()**

Method 2: Using **unique().**



The unique method takes a 1-D array or Series as an input and returns a list of unique items in it. The return value is a NumPy array and the contents in it based on the input passed. If indices are supplied as input, then the return value will also be the indices of the unique value.

Syntax: *pandas.unique(Series)*

Example:

Python3

```
# import library
import pandas as pd
```



```
df = pd.DataFrame({
  'height' : [165, 165, 164,
              158, 167, 160,
              158, 165],

  'weight' : [63.5, 64, 63.5,
              54, 63.5, 62,
              64, 64],

  'age' : [20, 22, 22
```

```
   index = ['Steve', 'Ria', 'Nivi',
            'Jane', 'Kate', 'Lucy',
            'Ram', 'Niki'])

# counting unique values
n = len(pd.unique(df['height']))

print("No.of.unique values :",
      n)
```

Output:

```
No.of.unique values : 5
```

Method 3: Using Dataframe.nunique().

This method returns the count of unique values in the specified axis. The syntax is :

Syntax: *Dataframe.nunique (axis=0/1, dropna=True/False)*

Example:

Python3

```
# import library
import pandas as pd

# create a Dataframe
df = pd.DataFrame({
  'height' : [165, 165, 164,
              158, 167, 160,
              158, 165],

  'weight' : [63.5, 64, 63.5,
              54, 63.5, 62,
              64, 64],

  'age' : [20, 22, 22,
           21, 23, 22,
           20, 21]},

   index = ['Steve', 'Ria', 'Nivi',
```

```
# check the values of
# each row for each column
n = df.nunique(axis=0)

print("No.of.unique values in each column :\n",
      n)
```

Output:

```
No.of.unique values in each column :
height    5
weight    4
age       4
dtype: int64
```

To get the number of unique values in a specified column:

Syntax: *Dataframe.col_name.nunique()*

Example:

Python3

```
# import library
import pandas as pd

# create a Dataframe
df = pd.DataFrame({
  'height' : [165, 165, 164,
              158, 167, 160,
              158, 165],

  'weight' : [63.5, 64, 63.5,
              54, 63.5, 62,
              64, 64],

  'age' : [20, 22, 22,
           21, 23, 22,
           20, 21]},
```

```
# count no. of unique
# values in height column
n = df.height.nunique()

print("No.of.unique values in height column :",
      n)
```

Output:

```
No.of.unique values in height column : 5
```

Method 3: Using Series.value_counts().

This method returns the count of all unique values in the specified column.

Syntax: *Series.value_counts(normalize=False, sort=True, ascending=False, bins=None, dropna=True)*

Example:

Python3

```
# import library
import pandas as pd

# create a Dataframe
df = pd.DataFrame({
  'height' : [165, 165, 164,
              158, 167, 160,
              158, 165],

  'weight' : [63.5, 64, 63.5,
              54, 63.5, 62,
              64, 64],

  'age' : [20, 22, 22,
           21, 23, 22,
           20, 21]},

   index = ['Steve', 'Ria', 'Nivi',
            'Jane', 'Kate', 'Lucy',
            'Ram', 'Niki'])
```

```
li = list(df.height.value_counts())

# print the unique value counts
print("No.of.unique values :",
      len(li))
```

Output:

```
No.of.unique values : 5
```

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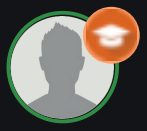

erakshaya485
@erakshaya485

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