Autocomplete TAB

In [1]:

```
%config Completer.use_jedi = False
```

Import libraries and load dataset

In [2]:

```
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

In [3]:

```
kepesertaan = pd.read_csv('01_kepesertaan.txt', sep='|')
```

In [4]:

```
df = kepesertaan.copy()
df.head()
```

Out[4]:

	PSTV01	PSTV02	PSTV03	PSTV04	PSTV05	PSTV06	PSTV07	PSTV08	PSTV09	PSTV10	PST
0	15	15	1944-03-01	1	2	9	3	2	72	7206	
1	64	64	1971-12-10	1	2	2	3	3	76	7603	
2	101	101	1967-12-31	1	1	2	2	5	12	1273	
3	218	218	1961-01-30	1	2	3	3	2	18	1801	
4	340	70225684	1991-05-31	3	2	2	2	5	33	3311	

Exploratory Data Analysis

In [5]:

```
df.drop(index=1312440, inplace=True)
```

In [6]:

```
df['PSTV03'] = pd.to_datetime(df['PSTV03'])
```

In [7]:

```
# Determine Age of Participanti in 30 December 2020
des_2021 = pd.to_datetime('2020-12-30', format='%Y-%m-%d')
df['Age'] = (des_2021 - df['PSTV03']).astype('<m8[Y]')
df.head()
```

Out[7]:

	PSTV01	PSTV02	PSTV03	PSTV04	PSTV05	PSTV06	PSTV07	PSTV08	PSTV09	PSTV10	PST
0	15	15	1944-03-01	1	2	9	3	2	72	7206	
1	64	64	1971-12-10	1	2	2	3	3	76	7603	
2	101	101	1967-12-31	1	1	2	2	5	12	1273	
3	218	218	1961-01-30	1	2	3	3	2	18	1801	
4	340	70225684	1991-05-31	3	2	2	2	5	33	3311	

In [8]:

```
# Function for data info
def data_info(df):
    column  = []
    nunique = []
    null_val= []
    null_per= []
    dtype   = []
    for col in df.columns:
        column.append(col)
        nunique.append(df[col].nunique())
        null_val.append(df[col].isnull().sum())
        null_per.append((df[col].isnull().sum()/df[col].count())*100)
        dtype.append(df[col].dtypes)
    return pd.DataFrame({'Column': column, 'N-unique': nunique, 'Null Value': null_v
```

In [9]:

```
data_info(df)
```

Out[9]:

	Column	N-unique	Null Value	Null Percent	Dtype
0	PSTV01	1971743	0	0.0000	int64
1	PSTV02	704887	0	0.0000	int64
2	PSTV03	34384	0	0.0000	datetime64[ns]
3	PSTV04	5	0	0.0000	int64
4	PSTV05	2	0	0.0000	int64
5	PSTV06	4	0	0.0000	int64
6	PSTV07	4	0	0.0000	int64
7	PSTV08	6	0	0.0000	int64
8	PSTV09	35	0	0.0000	int64
9	PSTV10	515	0	0.0000	int64
10	PSTV11	10	0	0.0000	int64
11	PSTV12	4	0	0.0000	int64
12	PSTV13	35	0	0.0000	int64
13	PSTV14	515	0	0.0000	int64
14	PSTV15	55152	0	0.0000	float64
15	PSTV16	3	0	0.0000	int64

	Column	N-unique	Null Value	Null Percent	Dtype
16	PSTV17	20	0	0.0000	int64
17	PSTV18	5	1945346	7369.5723	float64
18	Age	111	0	0.0000	float64

Data Visualization

Univariate Analysis

In [10]:

```
# Pie Plot Function
def pie_plot(col):
    # Pie chart
    label = df[col].value_counts(sorted).index
    data  = df[col].value_counts(sorted).values
    fig1, ax1 = plt.subplots()
    ax1.pie(data, labels=label, autopct='%1.1f%%', shadow=True, startangle=90)

    # Equal aspect ratio ensures that pie is drawn as a circle
    ax1.axis('equal')
    plt.tight_layout()
    plt.show()
```

In [11]:

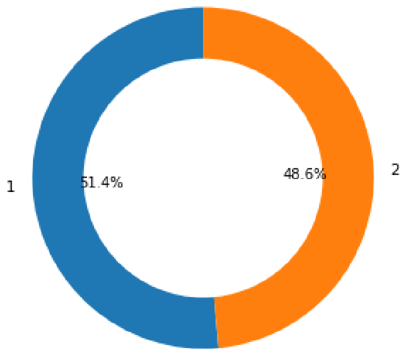
```
#Pie Plot (Donut) Function
def donut_plot(col):
    # Pie chart
    label = df[col].value_counts(sorted).index
    data  = df[col].value_counts(sorted).values
    fig1, ax1 = plt.subplots()
    ax1.pie(data, labels=label, autopct='%1.1f%%', startangle=90)

    #draw circle
    centre_circle = plt.Circle((0,0),0.70,fc='white')
    fig = plt.gcf()
    fig.gca().add_artist(centre_circle)

    # Equal aspect ratio ensures that pie is drawn as a circle
    ax1.axis('equal')
    plt.tight_layout()
    plt.show()
```

In [12]:

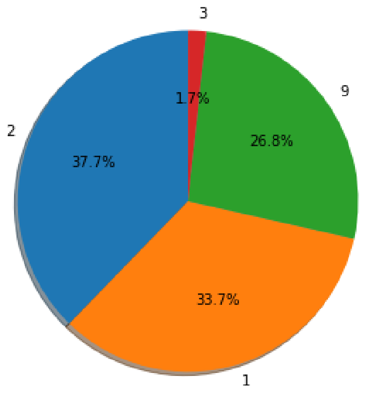
```
donut_plot('PSTV05')
```



1(man) and 2(woman), so there is more man than woman in this dataset

In [13]:

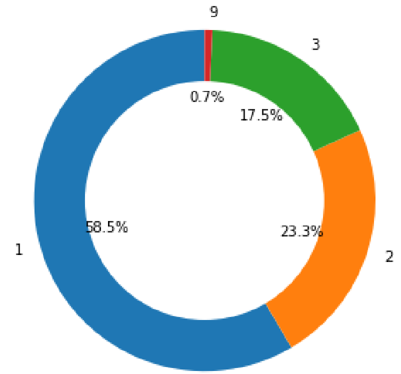
```
# Marital Status
pie_plot('PSTV06')
```



1(single), 2(married), 3(divorce), 4(undefined). So in this dataset the highest number of marital status is married

In [14]:

```
donut_plot('PSTV12')
```



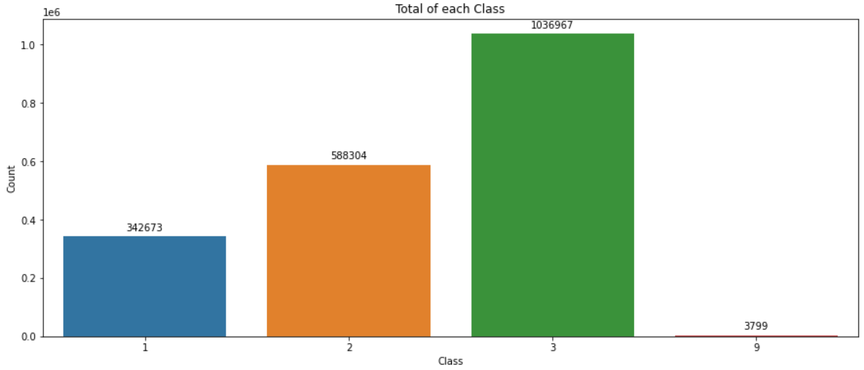
1(Puskesmas), 2(Klinik Pratama) 3(Dokter Umum), 9(Missing). So the highest number of Type of health facilities is class Puskesmas

In [15]:

```
def count_plot(col, xlabel, title):
    plt.figure(figsize=(15,6))
    # Countplot
    aa = sns.countplot(x=col, data=df)
    # Plot style
    for aa_value in aa.patches:
        aa.annotate(format(aa_value.get_height(), '.0f'),
                    (aa_value.get_x() + aa_value.get_width() / 2., aa_value.get_heig
                    ha = 'center', va = 'center',
                    xytext = (0, 9),
                    textcoords = 'offset points')
    # Plot label
    aa.set_xlabel(xlabel)
    aa.set_ylabel('Count')
    aa.set_title(title);
```

In [16]:

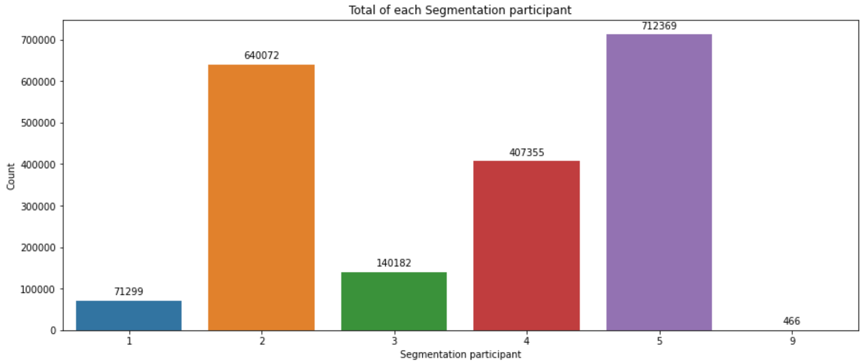
```
count_plot('PSTV07', 'Class', 'Total of each Class')
```



1(Class 1), 2(Class 2), 3(Class 3), 9(Missing). So the highest number of class participation is class 3

In [17]:

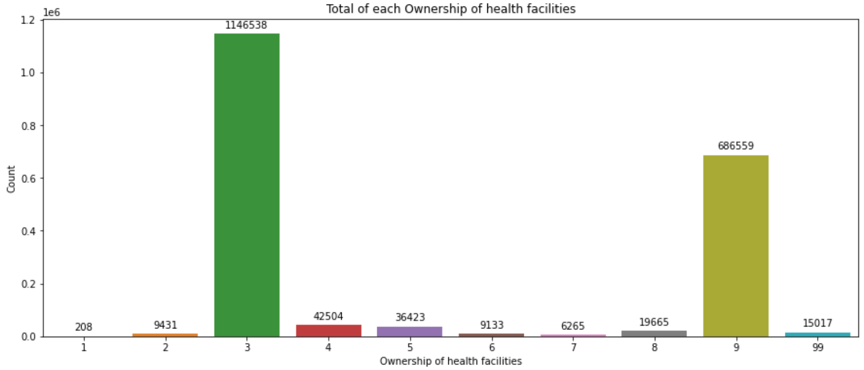
```
count_plot('PSTV08', 'Segmentation participant', 'Total of each Segmentation partici
```



1(Non-worker), 2(PBI APBN), 3(PBI APBD), 4(PBPU), 5(PPU), 9(Missing). So the highest number of segementation participant is PPU

In [18]:

```
count_plot('PSTV11', 'Ownership of health facilities', 'Total of each Ownership of h
```



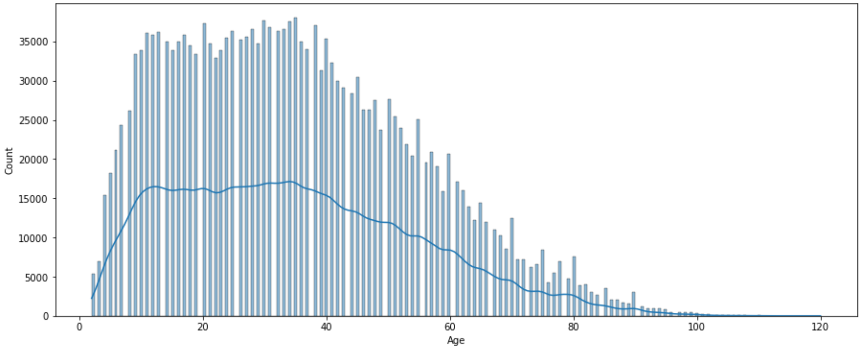
1(Vertical/central), 2(province), 3(city), 4(POLRI), 5(TNI AD), 6(TNI AL), 7(TNI AU), 8(BUMN), 9(SWASTA), 99(Missing). So the highest number of ownership of health facilities is Government City

In [19]:

```
plt.figure(figsize=(15,6))
sns.histplot(data=df, x="Age", kde=True)
```

Out[19]:

```
<AxesSubplot:xlabel='Age', ylabel='Count'>
```



Bivariate Analysis

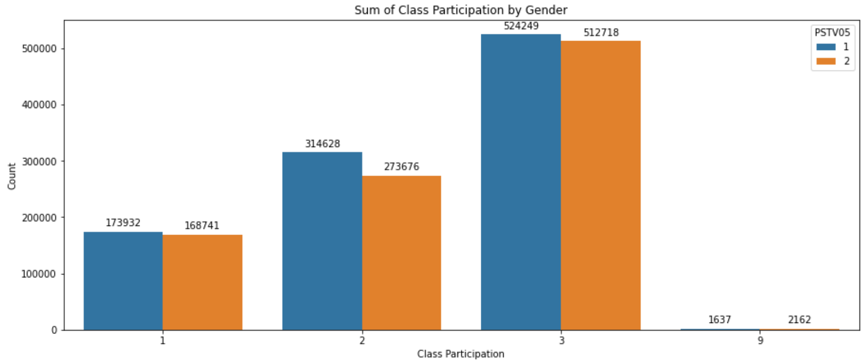
In [20]:
```
df.head()
```

Out[20]:

	PSTV01	PSTV02	PSTV03	PSTV04	PSTV05	PSTV06	PSTV07	PSTV08	PSTV09	PSTV10	PST
0	15	15	1944-03-01	1	2	9	3	2	72	7206	
1	64	64	1971-12-10	1	2	2	3	3	76	7603	
2	101	101	1967-12-31	1	1	2	2	5	12	1273	
3	218	218	1961-01-30	1	2	3	3	2	18	1801	
4	340	70225684	1991-05-31	3	2	2	2	5	33	3311	

In [21]:
```
def biv_count_plot(col, hue, xlabel, title):
    plt.figure(figsize=(15,6))
    # Countplot
    aa = sns.countplot(x=col, hue=hue, data=df)
    # Plot style
    for aa_value in aa.patches:
        aa.annotate(format(aa_value.get_height(), '.0f'),
                    (aa_value.get_x() + aa_value.get_width() / 2., aa_value.get_heig
                    ha = 'center', va = 'center',
                    xytext = (0, 9),
                    textcoords = 'offset points')
    # Plot label
    aa.set_xlabel(xlabel)
    aa.set_ylabel('Count')
    aa.set_title(title);
```

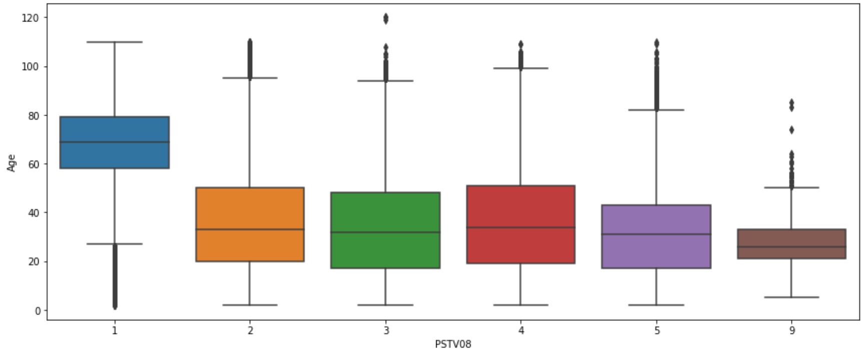
In [22]:
```
biv_count_plot('PSTV07', 'PSTV05', 'Class Participation', 'Sum of Class Participatio
```



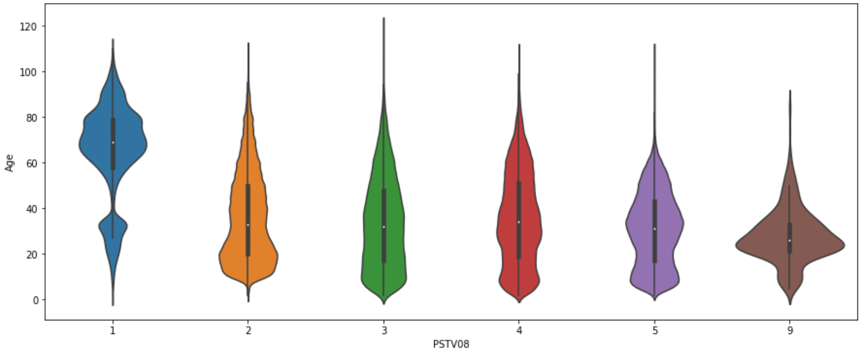
In [23]:
```
def one_box_plot (x, y):
    plt.figure(figsize=(15,6))
    sns.boxplot(data = df, x=x, y=y);

def one_violin_plot (x, y):
    plt.figure(figsize=(15,6))
    sns.violinplot(data = df, x=x, y=y);
```

In [24]:
```
one_box_plot('PSTV08', 'Age')
```



In [25]:
```
one_violin_plot('PSTV08', 'Age')
```



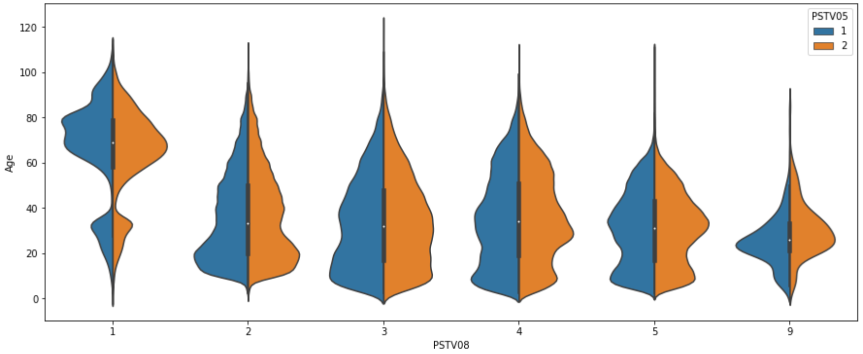
Multivariate Analysis

In [26]:

```
def bi_violin_plot (x, y, hue):
    plt.subplots(figsize=(15, 6))
    sns.violinplot(x=x, y=y, hue=hue, kind="violin", split=True, data=df);
```

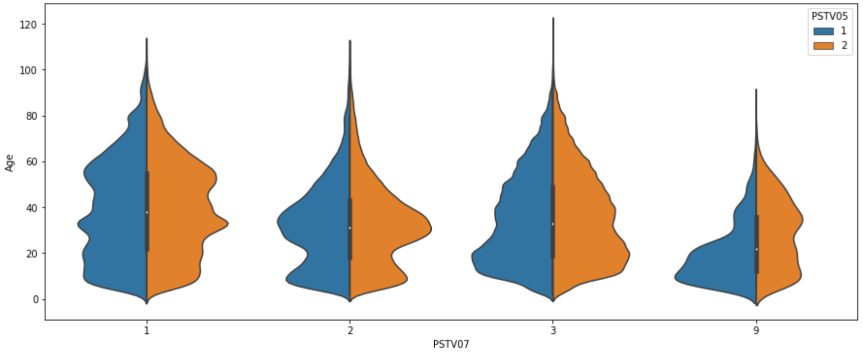
In [27]:

```
bi_violin_plot('PSTV08', 'Age', 'PSTV05')
```



In [28]:

```
bi_violin_plot('PSTV07', 'Age', 'PSTV05')
```



In [ ]: