```
In [1]:  import numpy as np
         import pandas as pd
         import matplotlib.pyplot as plt
```

```
In [2]:  xls = pd.ExcelFile('notes.xls')
         MedicalServices = pd.read_excel(xls, 'MedicalServices')
         SocialServices = pd.read_excel(xls, 'SocialServices')
         ATN = pd.read_excel(xls, 'ATN')
         GeneralSE = pd.read_excel(xls, 'GeneralSE')
         SocialSecurity = pd.read_excel(xls, 'SocialSecurity')
         EmpBusOwner = pd.read_excel(xls, 'EmpBusOwner')
         Citizenship = pd.read_excel(xls, 'Citizenship')
         Housing = pd.read_excel(xls, 'Housing')
         EET  = pd.read_excel(xls, 'EET')
         ConnDSRVR = pd.read_excel(xls, 'ConnDSRVR')
         ETS  = pd.read_excel(xls, 'ETS')
         WRC = pd.read_excel(xls, 'WRC')
```

Service Connentions

Medical Service/Medicare

```
In [3]:  a = MedicalServices.Participants.groupby(MedicalServices.Service).count
         ()
```

```
In [4]:  a
```

```
Out[4]:  Service
         0    32
         1    19
         Name: Participants, dtype: int64
```
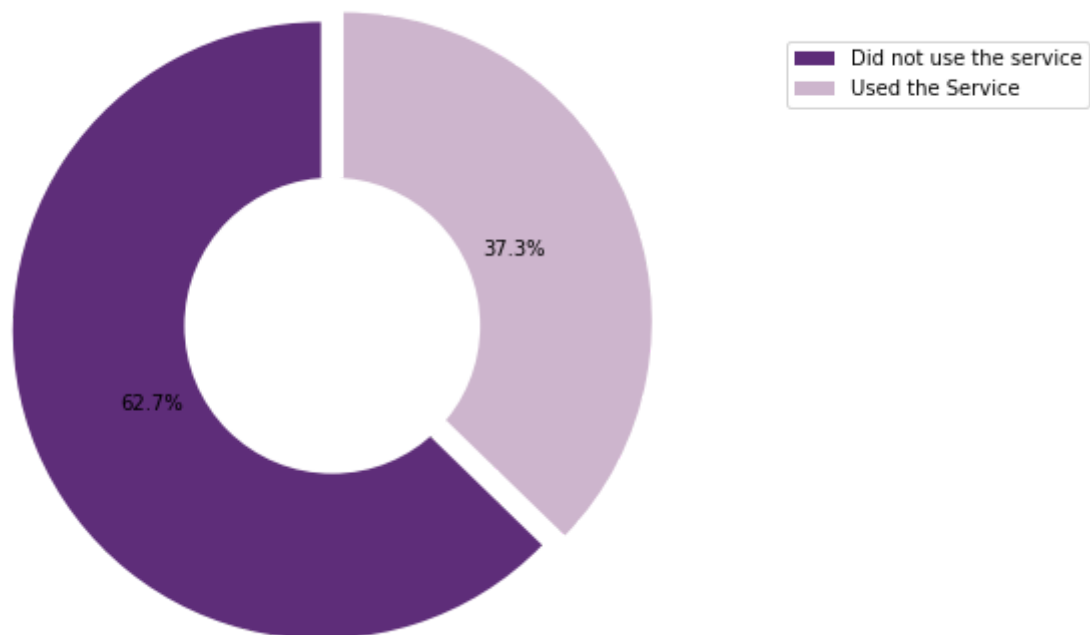
```
In [5]:  colors = ['#5E2D79', '#CDB5CD']
         explode = (0.1,0.1)
         labels = ['Did not use the service','Used the Service']
```

In [6]:
```python
plt.figure(figsize=(15,14))
plt.subplot(2, 2,1)
plt.pie(a, colors=colors, startangle=90,frame=True, explode=explode,radi
us=2.5, autopct='%1.1f%%')
centre_circle = plt.Circle((0,0),1.2,color='black', fc='white',linewidth
=0)
fig = plt.gcf()
fig.gca().add_artist(centre_circle)
plt.axis('off')
plt.tight_layout()
plt.title("Percentage of participants that used Medical Services / Medic
are", color = 'purple')
plt.legend(labels=labels, bbox_to_anchor=(1.05, 1), loc='upper left', bo
rderaxespad=3)
plt.plot()
```

```
/anaconda3/lib/python3.6/site-packages/matplotlib/tight_layout.py:199:
UserWarning: Tight layout not applied. tight_layout cannot make axes wi
dth small enough to accommodate all axes decorations
  warnings.warn('Tight layout not applied. '
```

Out[6]: []

Percentage of participants that used Medical Services / Medicare

Social Service

In [7]:
```python
b = SocialServices.Participants.groupby(SocialServices.Service).count()
```

```
In [8]:  b
```

```
Out[8]:  Service
         0    16
         1    35
         Name: Participants, dtype: int64
```

```
In [9]:  colors = ['#0D4F8B', '#BCD2EE']
         explode = (0.1,0.1)
         labels = ['Did not use the service','Used the Service']
```

```
In [10]:  plt.figure(figsize=(15,14))
          plt.subplot(2, 2,1)
          plt.pie(b, colors=colors, startangle=90,frame=True, explode=explode,radi
          us=2.5, autopct='%1.1f%%')
          centre_circle = plt.Circle((0,0),1.2,color='black', fc='white',linewidth
          =0)
          fig = plt.gcf()
          fig.gca().add_artist(centre_circle)
          plt.axis('off')
          plt.tight_layout()
          plt.title("Percentage of participants that used Social Services", color
          = 'Blue')
          plt.legend(labels=labels, bbox_to_anchor=(1.05, 1), loc='upper left', bo
          rderaxespad=3)
          plt.plot()
```

```
Out[10]:  []
```

Percentage of participants that used Social Services

Did not use the service
Used the Service

31.4%

68.6%

Assistive Technology Needs
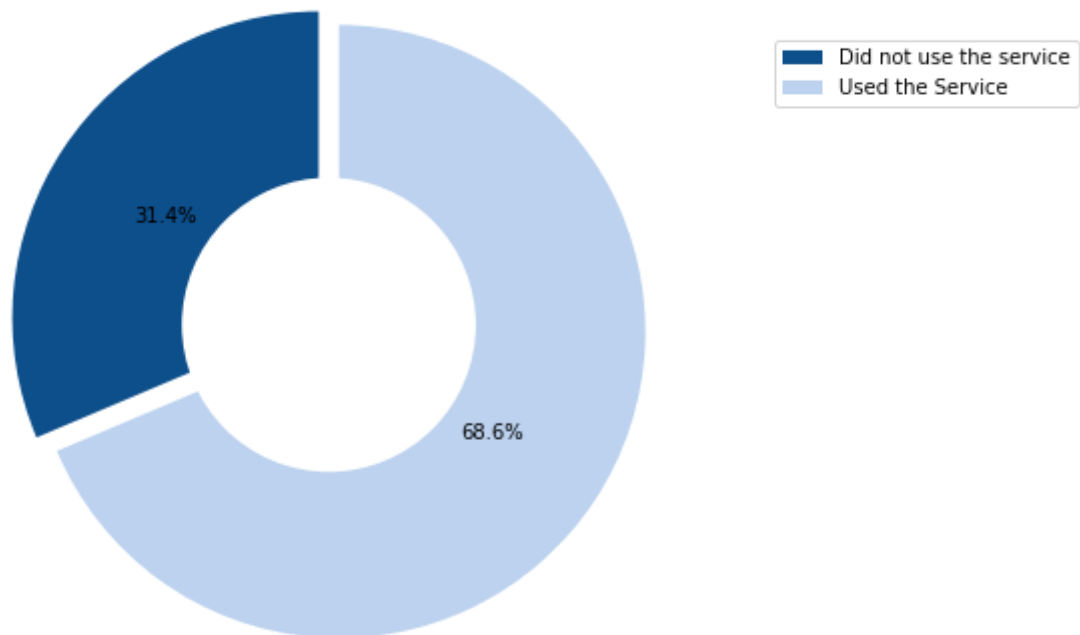
```
In [11]: c = ATN.Participants.groupby(ATN.Service).count()
```

```
In [12]: c
```
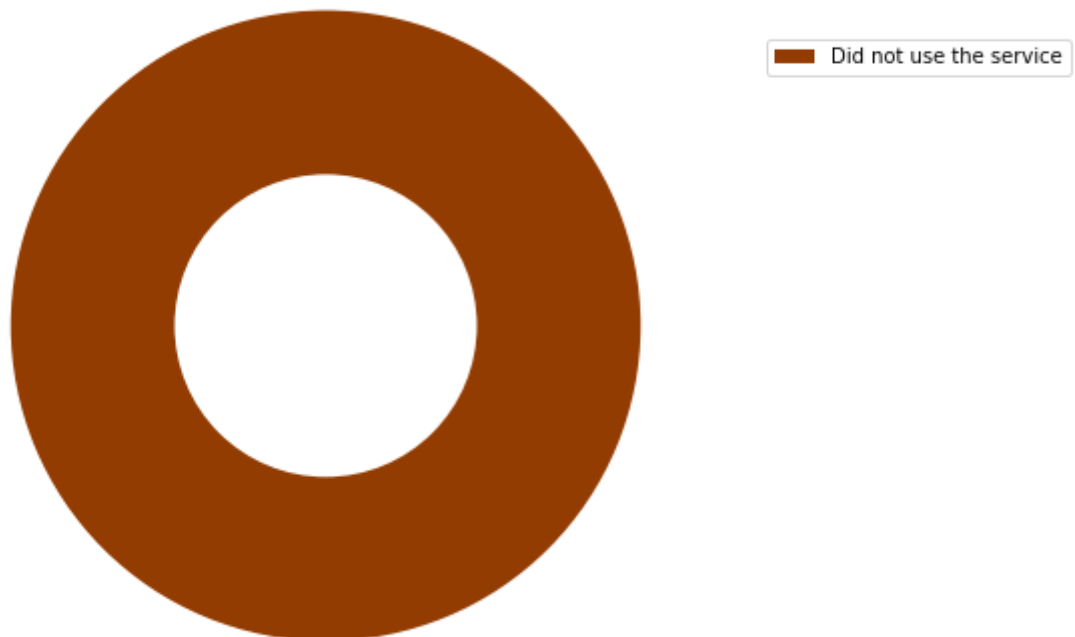
```
Out[12]: Service
         0    51
         Name: Participants, dtype: int64
```

```
In [13]: colors = ['#923c01']
         labels = ['Did not use the service']
```

```
In [14]: plt.figure(figsize=(15,14))
         plt.subplot(2, 2,1)
         plt.pie(c, colors=colors, startangle=90,frame=True,radius=2.5)
         centre_circle = plt.Circle((0,0),1.2,color='black', fc='white',linewidth
         =0)
         fig = plt.gcf()
         fig.gca().add_artist(centre_circle)
         plt.axis('off')
         plt.tight_layout()
         plt.title("Percentage of participants provided with Assistive Technology
         Needs", color = 'Brown')
         plt.legend(labels=labels, bbox_to_anchor=(1.05, 1), loc='upper left', bo
         rderaxespad=3)
         plt.plot()
```

```
Out[14]: []
```


General or Self - Employment

```
In [15]: d = GeneralSE.Participants.groupby(GeneralSE.Service).count()
```

```
In [16]: d
```

```
Out[16]: Service
         0    32
         1    19
         Name: Participants, dtype: int64
```

```
In [17]: colors = ['#006767', '#009a9a']
         explode = (0.1,0.1)
         labels = ['Did not use the service','Used the Service']
```

```
In [18]: plt.figure(figsize=(15,14))
         plt.subplot(2, 2,1)
         plt.pie(d, colors=colors, startangle=90,frame=True, explode=explode,radi
         us=2.5, autopct='%1.1f%%')
         centre_circle = plt.Circle((0,0),1.2,color='black', fc='white',linewidth
         =0)
         fig = plt.gcf()
         fig.gca().add_artist(centre_circle)
         plt.axis('off')
         plt.tight_layout()
         plt.title("Percentage of participants that used General or Self Employme
         nt Services", color = 'Teal')
         plt.legend(labels=labels, bbox_to_anchor=(1.05, 1), loc='upper left', bo
         rderaxespad=3)
         plt.plot()
```

```
Out[18]: []
```
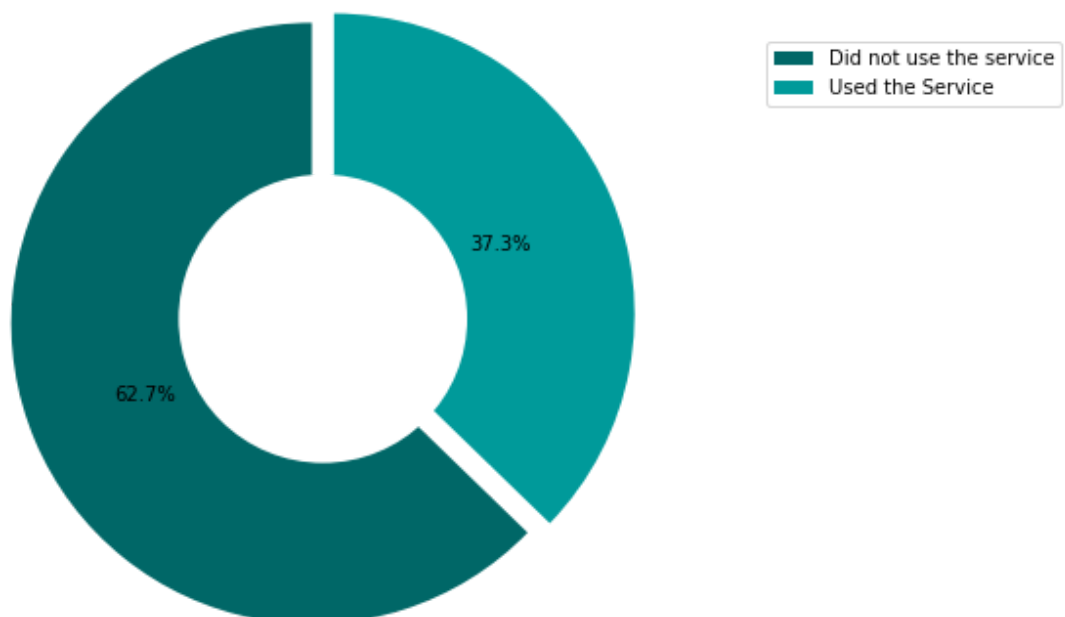
Social Security Benefits

```
In [19]:  e = SocialSecurity.Participants.groupby(SocialSecurity.Service).count()
```

```
In [20]:  e
```

```
Out[20]: Service
          0   29
          1   22
          Name: Participants, dtype: int64
```

```
In [21]:  colors = ['#fa86c4', '#f2b8c6']
          explode = (0.1,0.1)
          labels = ['Did not use the service','Used the Service']
```

```
In [22]:  plt.figure(figsize=(15,14))
          plt.subplot(2, 2,1)
          plt.pie(e, colors=colors, startangle=90,frame=True, explode=explode,radi
          us=2.5, autopct='%1.1f%%')
          centre_circle = plt.Circle((0,0),1.2,color='black', fc='white',linewidth
          =0)
          fig = plt.gcf()
          fig.gca().add_artist(centre_circle)
          plt.axis('off')
          plt.tight_layout()
          plt.title("Percentage of participants that used Social Security Benefit
          s", color = 'Red')
          plt.legend(labels=labels, bbox_to_anchor=(1.05, 1), loc='upper left', bo
          rderaxespad=3)
          plt.plot()
```

Out[22]: []

Percentage of participants that used Social Security Benefits
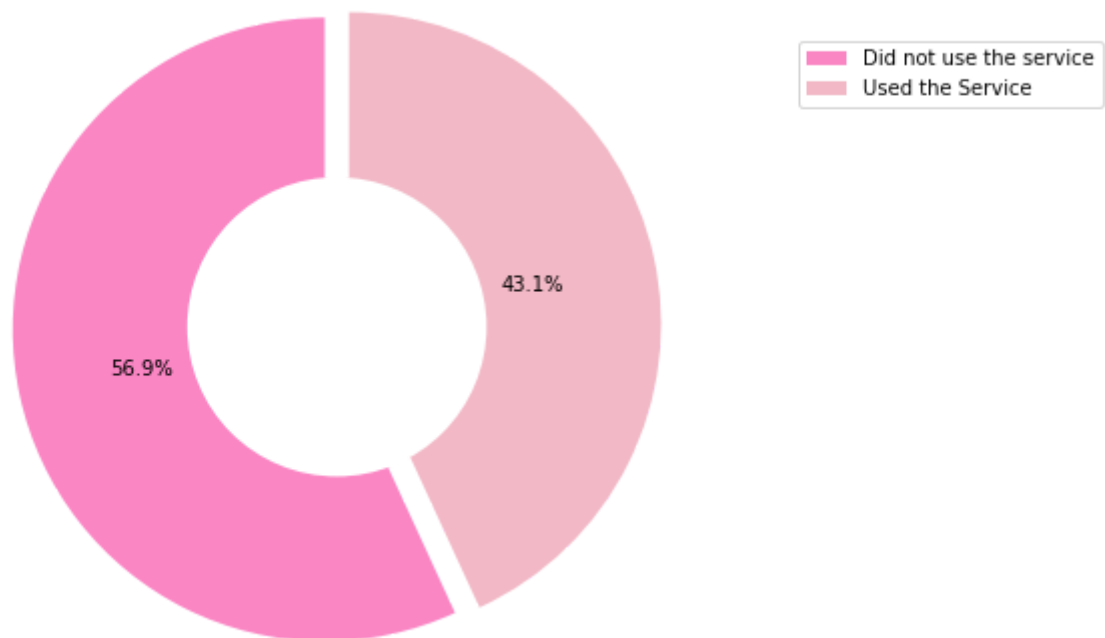
Employer, Business Owner

```
In [23]:  f = EmpBusOwner.Participants.groupby(EmpBusOwner.Service).count()
```

```
In [24]:  f
```

Out[24]: Service
          0   50
          1   1
          Name: Participants, dtype: int64

```
In [25]:  colors = ['#5c5c5c', '#adadad']
          explode = (0.1,0.1)
          labels = ['Did not use the service','Used the Service']
```

```
In [26]:  plt.figure(figsize=(15,14))
          plt.subplot(2, 2,1)
          plt.pie(f, colors=colors, startangle=90,frame=True, explode=explode,radi
          us=2.5, autopct='%1.1f%%')
          centre_circle = plt.Circle((0,0),1.2,color='black', fc='white',linewidth
          =0)
          fig = plt.gcf()
          fig.gca().add_artist(centre_circle)
          plt.axis('off')
          plt.tight_layout()
          plt.title("Percentage of participants using Employer/Business Owner Serv
          ice", color = 'Grey')
          plt.legend(labels=labels, bbox_to_anchor=(1.05, 1), loc='upper left', bo
          rderaxespad=3)
          plt.plot()
```

Out[26]: []
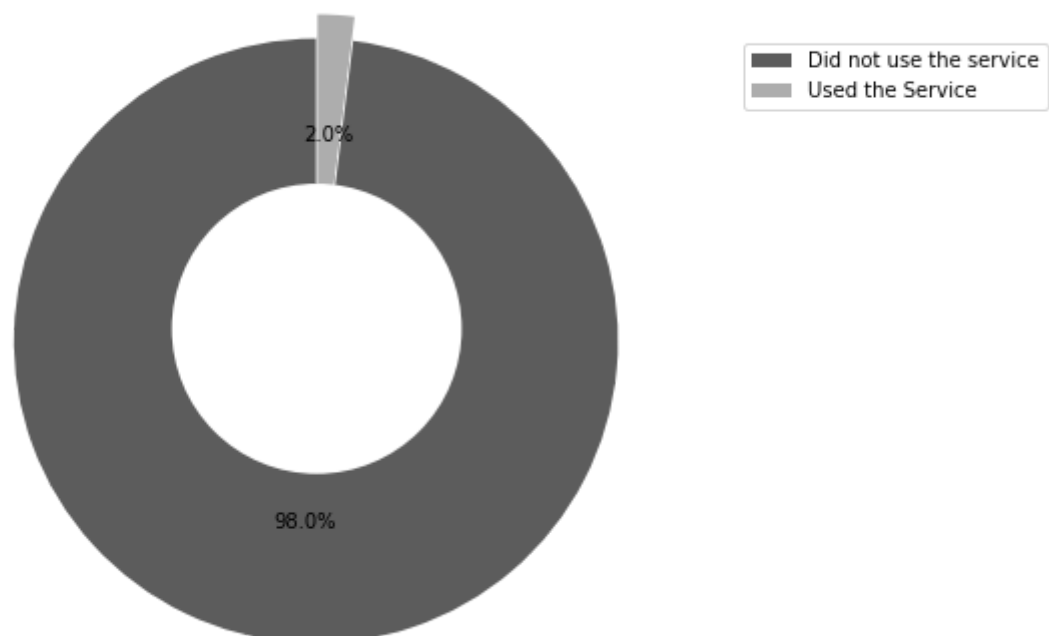
Citizenship

```
In [27]:  g = Citizenship.Participants.groupby(Citizenship.Service).count()
```

```
In [28]: g
```

```
Out[28]: Service
         0    44
         1     7
         Name: Participants, dtype: int64
```
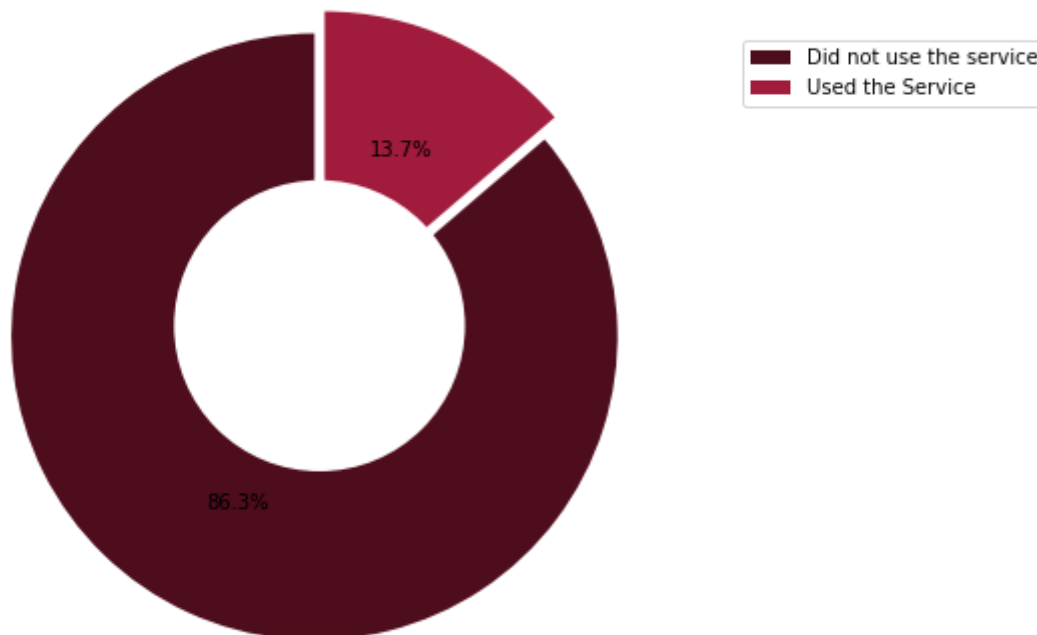
```
In [29]: colors = ['#4e0d1d', '#a11b3c']
         explode = (0.1,0.1)
         labels = ['Did not use the service','Used the Service']
```

```
In [30]: plt.figure(figsize=(15,14))
         plt.subplot(2, 2,1)
         plt.pie(g, colors=colors, startangle=90,frame=True, explode=explode,radi
         us=2.5, autopct='%1.1f%%')
         centre_circle = plt.Circle((0,0),1.2,color='black', fc='white',linewidth
         =0)
         fig = plt.gcf()
         fig.gca().add_artist(centre_circle)
         plt.axis('off')
         plt.tight_layout()
         plt.title("Percentage of participants using Citizenship related Service"
         , color = 'Maroon')
         plt.legend(labels=labels, bbox_to_anchor=(1.05, 1), loc='upper left', bo
         rderaxespad=3)
         plt.plot()
```

```
Out[30]: []
```

Percentage of participants using Citizenship related Service

Housing

```
In [31]: h = Housing.Participants.groupby(Housing.Service).count()
```

```
In [32]: h
```

```
Out[32]: Service
         0     50
         1      1
         Name: Participants, dtype: int64
```

```
In [33]: colors = ['#cccccc', '#191919']
         explode = (0.1,0.1)
         labels = ['Did not use the service','Used the Service']
```

```
In [34]: plt.figure(figsize=(15,14))
         plt.subplot(2, 2,1)
         plt.pie(h, colors=colors, startangle=90,frame=True, explode=explode,radi
         us=2.5, autopct='%1.1f%%')
         centre_circle = plt.Circle((0,0),1.2,color='black', fc='white',linewidth
         =0)
         fig = plt.gcf()
         fig.gca().add_artist(centre_circle)
         plt.axis('off')
         plt.tight_layout()
         plt.title("Percentage of participants using Housing related Service", co
         lor = 'Black')
         plt.legend(labels=labels, bbox_to_anchor=(1.05, 1), loc='upper left', bo
         rderaxespad=3)
         plt.plot()
```

```
Out[34]: []
```

Percentage of participants using Housing related Service
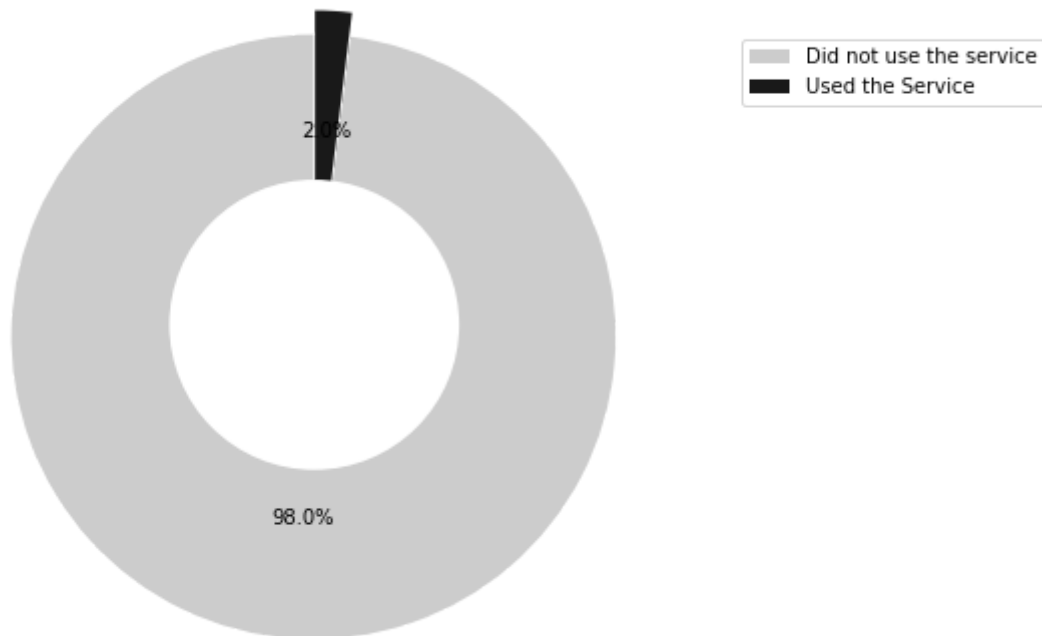
Education Connections

Education, ESL Training

```
In [35]: i = EET.Participants.groupby(EET.Service).count()
```

```
In [36]: i
```

```
Out[36]: Service
         0     7
         1     44
         Name: Participants, dtype: int64
```

```
In [37]: colors = ['#ffaa15', '#ffd700']
         explode = (0.1,0.1)
         labels = ['Did not use the service','Used the Service']
```

In [38]:
```python
plt.figure(figsize=(15,14))
plt.subplot(2, 2,1)
plt.pie(i, colors=colors, startangle=90,frame=True, explode=explode,radi
us=2.5, autopct='%1.1f%%')
centre_circle = plt.Circle((0,0),1.2,color='black', fc='white',linewidth
=0)
fig = plt.gcf()
fig.gca().add_artist(centre_circle)
plt.axis('off')
plt.tight_layout()
plt.title("Percentage of participants taht were provided Education/ESL T
raining", color = 'Orange')
plt.legend(labels=labels, bbox_to_anchor=(1.05, 1), loc='upper left', bo
rderaxespad=3)
plt.plot()
```

Out[38]: []

Percentage of participants taht were provided Education/ESL Training
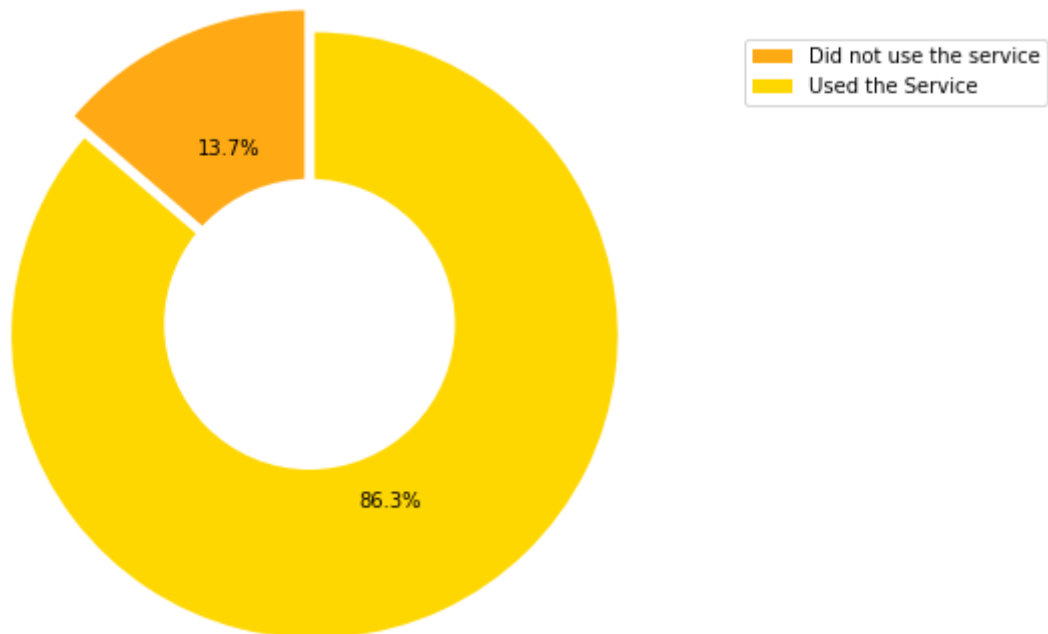
Connections to DSR and VR

In [39]:
```python
j = ConnDSRVR.Participants.groupby(ConnDSRVR.Service).count()
```

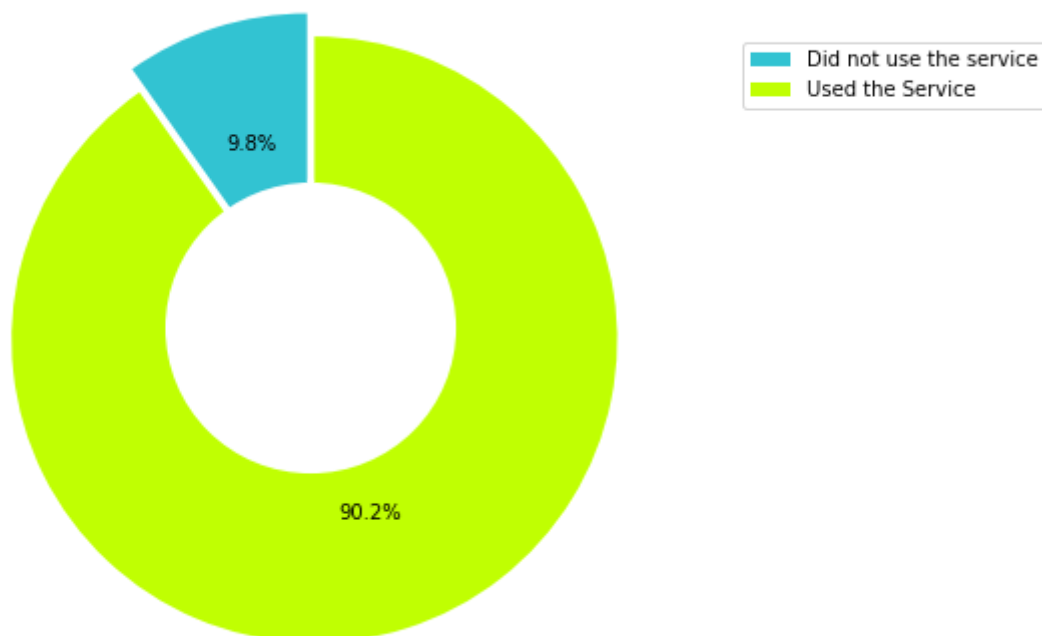In [40]:
```python
j
```

Out[40]:
```
Service
0     5
1    46
Name: Participants, dtype: int64
```

```
In [41]:  colors = ['#32c3d2', '#c0ff02']
          explode = (0.1,0.1)
          labels = ['Did not use the service','Used the Service']
```

```
In [42]:  plt.figure(figsize=(15,14))
          plt.subplot(2, 2,1)
          plt.pie(j, colors=colors, startangle=90,frame=True, explode=explode,radi
          us=2.5, autopct='%1.1f%%')
          centre_circle = plt.Circle((0,0),1.2,color='black', fc='white',linewidth
          =0)
          fig = plt.gcf()
          fig.gca().add_artist(centre_circle)
          plt.axis('off')
          plt.tight_layout()
          plt.title("Percentage of participants taht were provided DSR and VR", co
          lor = '#c0ff02')
          plt.legend(labels=labels, bbox_to_anchor=(1.05, 1), loc='upper left', bo
          rderaxespad=3)
          plt.plot()
```

Out[42]: []

Percentage of participants taht were provided DSR and VR

General Employment Training Services

```
In [43]:  k = ETS.Participants.groupby(ConnDSRVR.Service).count()
```

In [44]: k
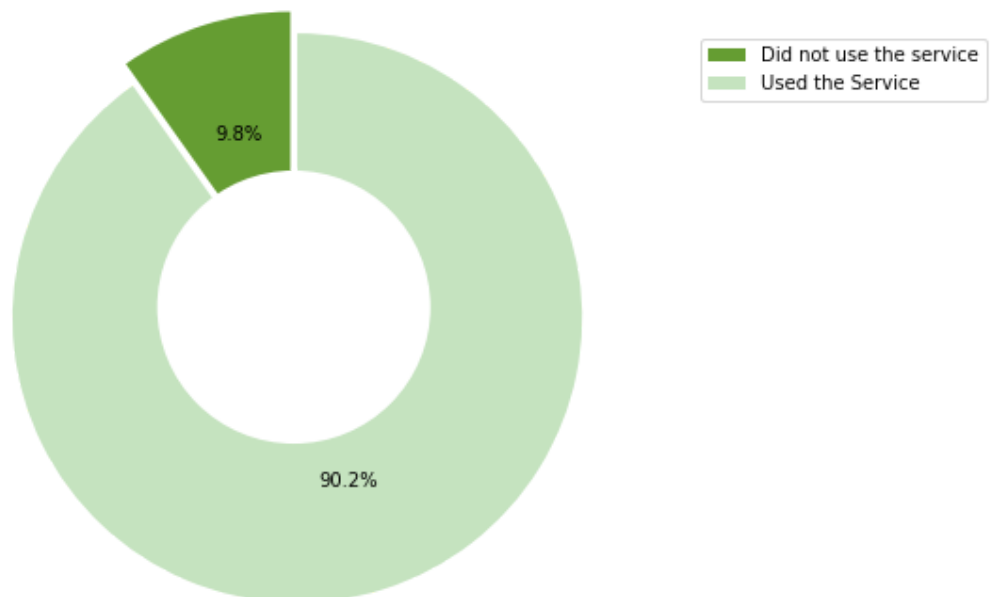
Out[44]: Service
         0   5
         1   46
         Name: Participants, dtype: int64

In [45]: colors = ['#659d32', '#c5e3bf']
         explode = (0.1,0.1)
         labels = ['Did not use the service','Used the Service']

In [46]: plt.figure(figsize=(15,14))
         plt.subplot(2, 2,1)
         plt.pie(k, colors=colors, startangle=90,frame=True, explode=explode,radi
         us=2.5, autopct='%1.1f%%')
         centre_circle = plt.Circle((0,0),1.2,color='black', fc='white',linewidth
         =0)
         fig = plt.gcf()
         fig.gca().add_artist(centre_circle)
         plt.axis('off')
         plt.tight_layout()
         plt.title("Percentage of participants taht were provided General Employm
         ent Training Services", color = 'Green')
         plt.legend(labels=labels, bbox_to_anchor=(1.05, 1), loc='upper left', bo
         rderaxespad=3)
         plt.plot()

Out[46]: []

Percentage of participants taht were provided General Employment Training Services

Work Related Connections

In [47]: `l = WRC.Participants.groupby(WRC.Service).count()`

In [48]: `l`

Out[48]:
```
Service
0    24
1    27
Name: Participants, dtype: int64
```

In [49]:
```python
colors = ['#fa8072', '#960018']
explode = (0.1,0.1)
labels = ['Did not use the service','Used the Service']
```

In [50]:
```python
plt.figure(figsize=(15,14))
plt.subplot(2, 2,1)
plt.pie(l, colors=colors, startangle=90,frame=True, explode=explode,radi
us=2.5, autopct='%1.1f%%')
centre_circle = plt.Circle((0,0),1.2,color='black', fc='white',linewidth
=0)
fig = plt.gcf()
fig.gca().add_artist(centre_circle)
plt.axis('off')
plt.tight_layout()
plt.title("Percentage of participants taht were provided Work Related Co
nnections", color = 'Red')
plt.legend(labels=labels, bbox_to_anchor=(1.05, 1), loc='upper left', bo
rderaxespad=3)
plt.plot()
```

Out[50]: `[]`

Percentage of participants taht were provided Work Related Connections