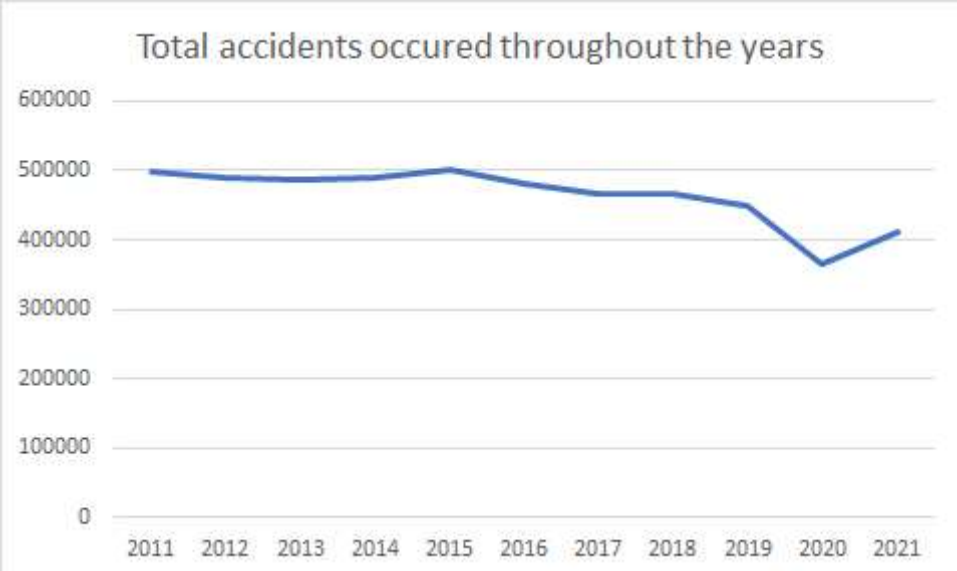
COMPUTATIONS AND RESULTS

Packages Used:

1. Pandas
2. Numpy
3. Matplotlib

Total Number of Accidents Occured in India (2011-2021)



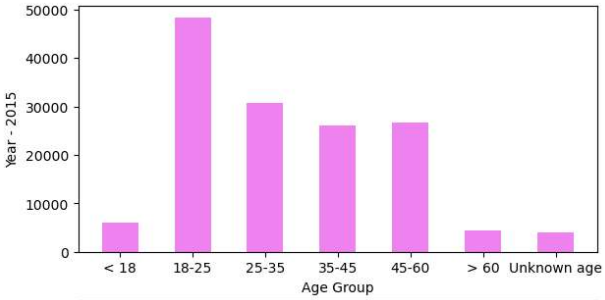
In [3]:
```
import matplotlib.pyplot as plt
import pandas as pd
```

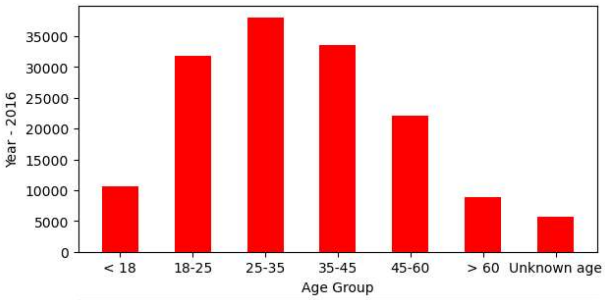
1. Age Profile of Fatal Road Vitcims

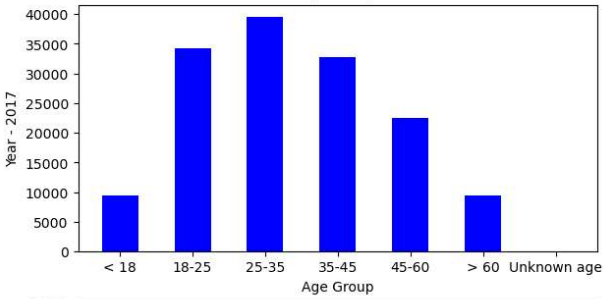
In [61]:
```
file = pd.read_excel('C:\\Users\\LENOVO\\Documents\\VIT\\Business Statistics\\SEM 2\\E
print(file)
plt.figure(figsize=(15, 15))

x_axis = file['Age Group']
y_axis = file[2015]
plt.subplot(4,2,1)
plt.bar(x_axis, y_axis, width=0.5,color='violet')
plt.xlabel("Age Group")
plt.ylabel("Year - 2015")

y_axis = file[2016]
plt.subplot(4,2,2)
plt.bar(x_axis, y_axis, width=0.5,color='red')
plt.xlabel("Age Group")
plt.ylabel("Year - 2016")

y_axis = file[2017]
plt.subplot(4,2,3)
```

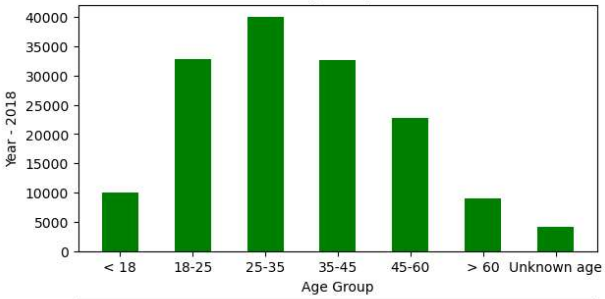
```
plt.bar(x_axis, y_axis, width=0.5,color='blue')
plt.xlabel("Age Group")
plt.ylabel("Year - 2017")

y_axis = file[2018]
plt.subplot(4,2,4)
plt.bar(x_axis, y_axis, width=0.5,color='green')
plt.xlabel("Age Group")
plt.ylabel("Year - 2018")

y_axis = file[2019]
plt.subplot(4,2,5)
plt.bar(x_axis, y_axis, width=0.5,color='pink')
plt.xlabel("Age Group")
plt.ylabel("Year - 2019")

y_axis = file[2020]
plt.subplot(4,2,6)
plt.bar(x_axis, y_axis, width=0.5,color='yellow')
plt.xlabel("Age Group")
plt.ylabel("Year - 2020")

y_axis = file[2021]
plt.subplot(4,2,7)
plt.bar(x_axis, y_axis, width=0.5,color='brown')
plt.xlabel("Age Group")
plt.ylabel("Year - 2021")
plt.show()
```

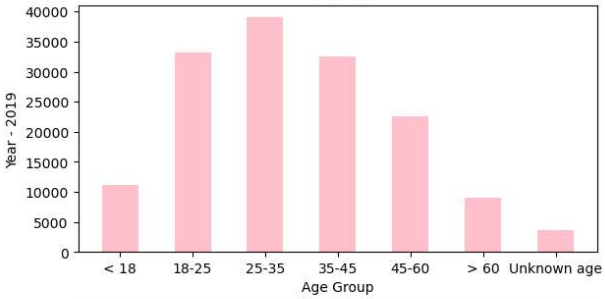
	Age Group	2015	2016	2017	2018	2019	2020	2021
0	< 18	5937	10622	9408	9977	11168	6998	7764
1	18-25	48420	31775	34244	32777	33206	27612	31750
2	25-35	30656	38076	39549	39960	39023	34947	39646
3	35-45	26046	33558	32788	32672	32509	29379	32741
4	45-60	26784	22174	22462	22798	22612	20938	26085
5	> 60	4380	8814	9384	9075	9004	8380	11739
6	Unknown age	3910	5766	78	4158	3591	3460	4247

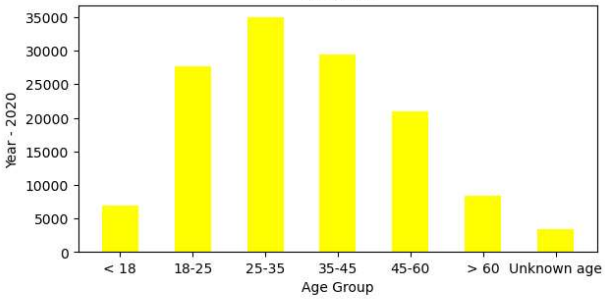

Year - 2015
Age Group
< 18
18-25
25-35
35-45
45-60
> 60
Unknown age

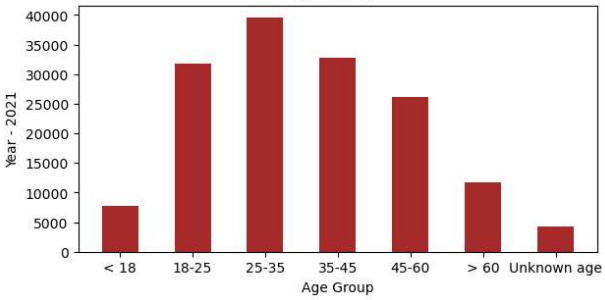

Year - 2016
Age Group
< 18
18-25
25-35
35-45
45-60
> 60
Unknown age

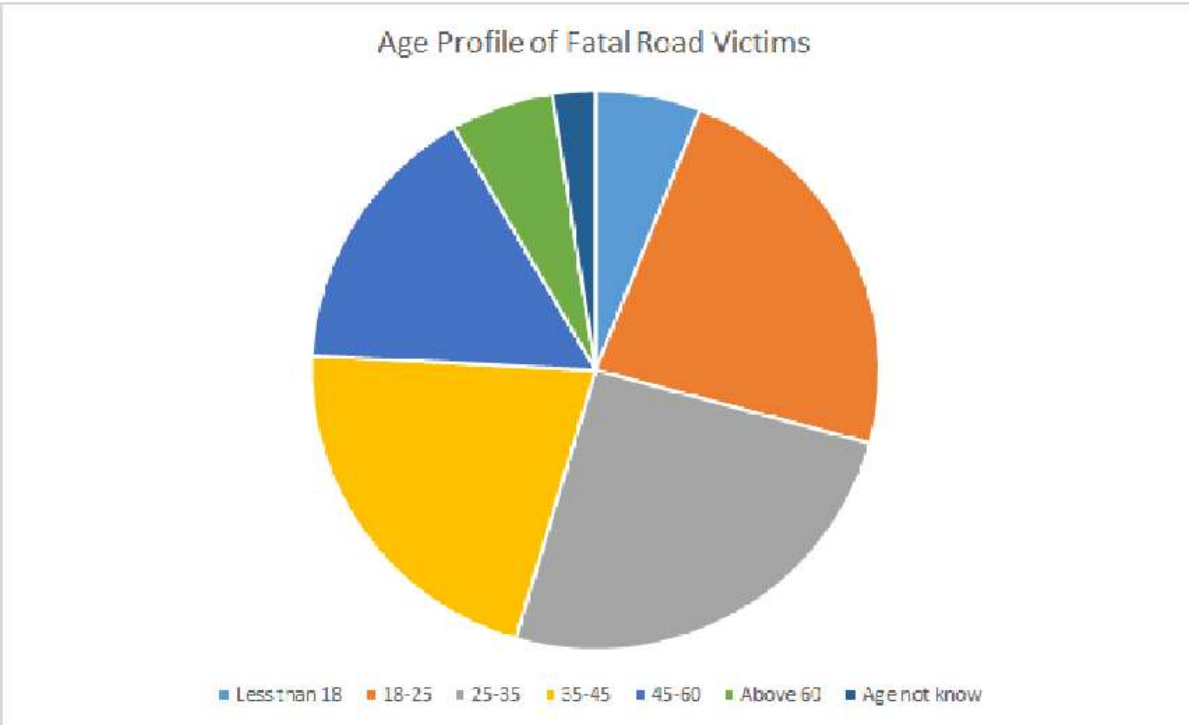

Year - 2017
Age Group
< 18
18-25
25-35
35-45
45-60
> 60
Unknown age


Year - 2018
Age Group
< 18
18-25
25-35
35-45
45-60
> 60
Unknown age


Year - 2019
Age Group
< 18
18-25
25-35
35-45
45-60
> 60
Unknown age


Year - 2020
Age Group
< 18
18-25
25-35
35-45
45-60
> 60
Unknown age


Year - 2021
Age Group
< 18
18-25
25-35
35-45
45-60
> 60
Unknown age


Age Profile of Fatal Road Victims
Less than 18
18-25
25-35
35-45
45-60
Above 60
Age not know

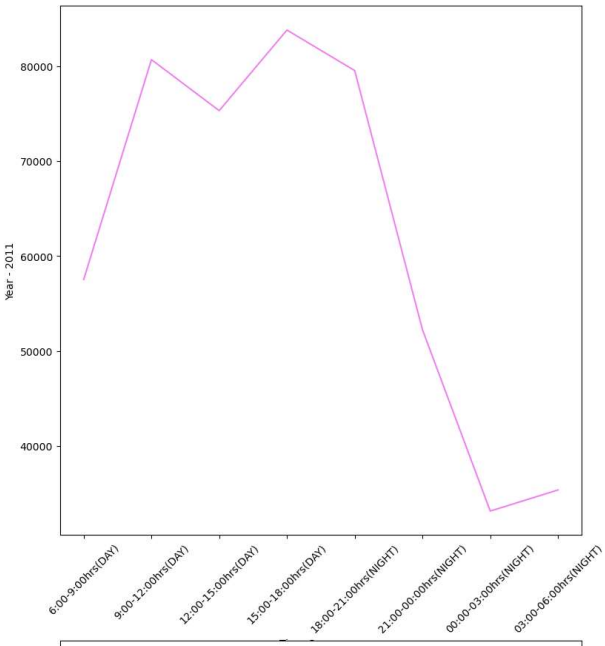
2. Time Occurence of Accidents

In [26]:
```
file = pd.read_excel('C:\\Users\\LENOVO\\Documents\\VIT\\Business Statistics\\SEM 2\\E
print(file)
plt.figure(figsize=(20,65))

x_axis = file['TIME']
y_axis = file[2011]
plt.subplot(6,2,1)
plt.plot(x_axis, y_axis,color='violet')
plt.xlabel("Time Occurence")
plt.ylabel("Year - 2011")
plt.xticks(rotation = 45)

y_axis = file[2012]
plt.subplot(6,2,2)
plt.plot(x_axis, y_axis,color='red')
plt.xlabel("Time Occurence")
plt.ylabel("Year - 2012")
plt.xticks(rotation = 45)

y_axis = file[2013]
plt.subplot(6,2,3)
plt.plot(x_axis, y_axis,color='blue')
plt.xlabel("Time Occurence")
plt.ylabel("Year - 2013")
plt.xticks(rotation = 45)

y_axis = file[2014]
plt.subplot(6,2,4)
plt.plot(x_axis, y_axis,color='green')
plt.xlabel("Time Occurence")
plt.ylabel("Year - 2014")
plt.xticks(rotation = 45)

y_axis = file[2015]
plt.subplot(6,2,5)
plt.plot(x_axis, y_axis,color='pink')
plt.xlabel("Time Occurence")
plt.ylabel("Year - 2015")
plt.xticks(rotation = 45)

y_axis = file[2016]
plt.subplot(6,2,6)
plt.plot(x_axis, y_axis,color='yellow')
plt.xlabel("Time Occurence")
plt.ylabel("Year - 2016")
plt.xticks(rotation = 45)

y_axis = file[2017]
plt.subplot(6,2,7)
plt.plot(x_axis, y_axis,color='brown')
plt.xlabel("Time Occurence")
plt.ylabel("Year - 2017")
plt.xticks(rotation = 45)

y_axis = file[2018]
plt.subplot(6,2,8)
```

```
plt.plot(x_axis, y_axis,color='orange')
plt.xlabel("Time Occurence")
plt.ylabel("Year - 2018")
plt.xticks(rotation = 45)

y_axis = file[2019]
plt.subplot(6,2,9)
plt.plot(x_axis, y_axis,color='c')
plt.xlabel("Time Occurence")
plt.ylabel("Year - 2019")
plt.xticks(rotation = 45)

y_axis = file[2020]
plt.subplot(6,2,10)
plt.plot(x_axis, y_axis,color='m')
plt.xlabel("Time Occurence")
plt.ylabel("Year - 2020")
plt.xticks(rotation = 45)

y_axis = file[2021]
plt.subplot(6,2,11)
plt.plot(x_axis, y_axis,color='teal')
plt.xlabel("Time Occurence")
plt.ylabel("Year - 2021")
plt.xticks(rotation = 45)
plt.show()
```

	TIME	2011	2012	2013	2014	2015	\
0	6:00-9:00hrs(DAY)	57531.0	56104.0	54585.0	53450.0	55518.0	
1	9:00-12:00hrs(DAY)	80709.0	77303.0	76851.0	78137.0	81964.0	
2	12:00-15:00hrs(DAY)	75336.0	74841.0	74894.0	76384.0	79616.0	
3	15:00-18:00hrs(DAY)	83829.0	84017.0	83258.0	84436.0	87819.0	
4	18:00-21:00hrs(NIGHT)	79555.0	80771.0	82149.0	83254.0	86836.0	
5	21:00-00:00hrs(NIGHT)	52239.0	51693.0	51749.0	52570.0	51425.0	
6	00:00-03:00hrs(NIGHT)	33130.0	31850.0	29823.0	29179.0	27954.0	
7	03:00-06:00hrs(NIGHT)	35357.0	33804.0	33167.0	31990.0	30291.0	
8	UNAVAILABILE	NaN	NaN	NaN	NaN	NaN	

	2016	2017	2018	2019	2020	2021
0	54522.0	51551.0	51489	49165	39435	43370.0
1	75771.0	71426.0	70211	66767	54496	61387.0
2	73380.0	71594.0	71392	67623	56090	63139.0
3	85834.0	82456.0	81619	78513	65263	73467.0
4	84555.0	85686.0	86986	86452	73607	85179.0
5	50970.0	49567.0	49162	48370	36432	41092.0
6	25976.0	25050.0	25407	23573	18003	19682.0
7	29644.0	27580.0	26571	25187	18921	20120.0
8	NaN	NaN	4207	3352	3891	NaN


Year - 2011
80000
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6:00-9:00hrs(DAY)
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12:00-15:00hrs(DAY)
15:00-18:00hrs(DAY)
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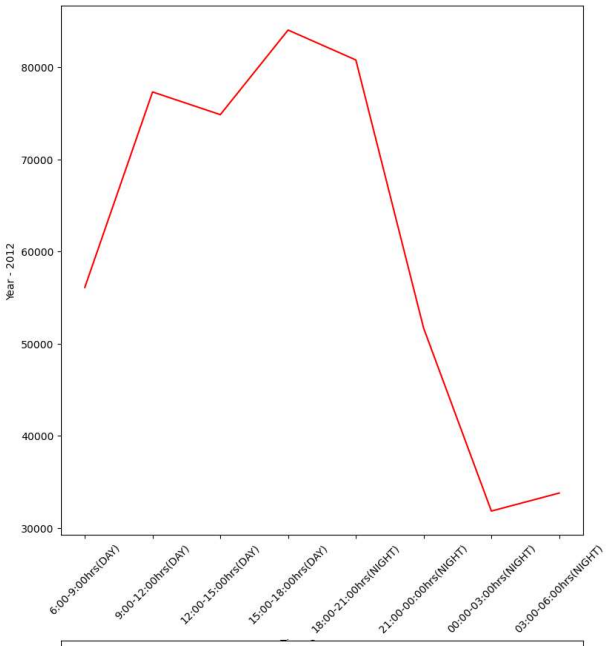
00:00-03:00hrs(NIGHT)
03:00-06:00hrs(NIGHT)


Year - 2012
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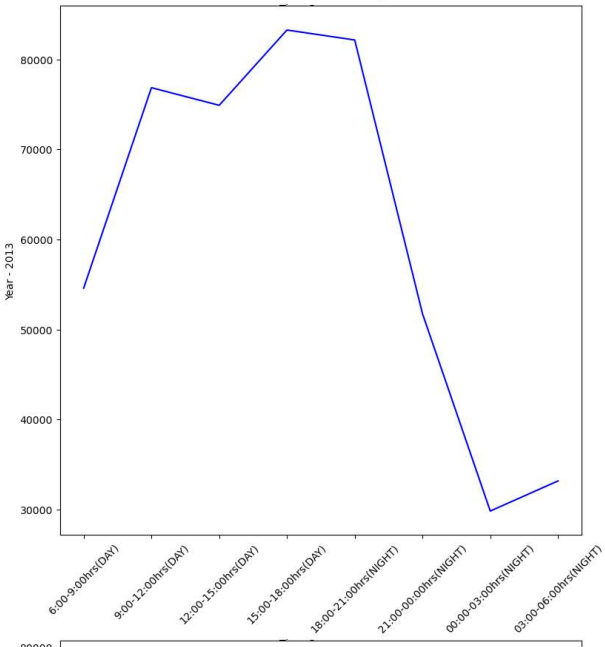
Year - 2013
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6:00-9:00hrs(DAY)
9:00-12:00hrs(DAY)
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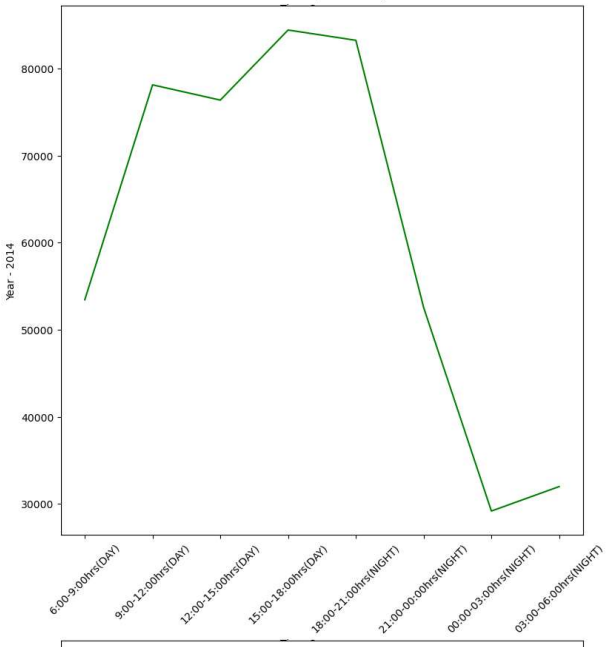
Year - 2014
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6:00-9:00hrs(DAY)
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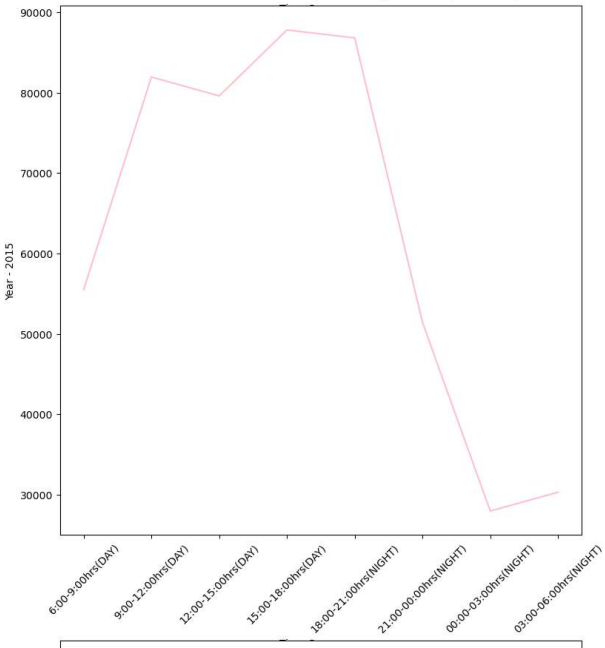
03:00-06:00hrs(NIGHT)


Year - 2015
90000
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6:00-9:00hrs(DAY)
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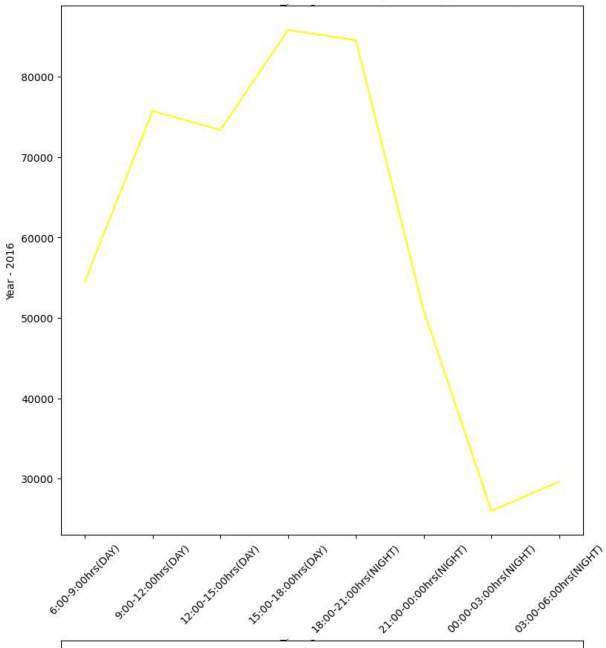
12:00-15:00hrs(DAY)
15:00-18:00hrs(DAY)
18:00-21:00hrs(NIGHT)
21:00-00:00hrs(NIGHT)
00:00-03:00hrs(NIGHT)
03:00-06:00hrs(NIGHT)


Year - 2016
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6:00-9:00hrs(DAY)
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12:00-15:00hrs(DAY)
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18:00-21:00hrs(NIGHT)
21:00-00:00hrs(NIGHT)
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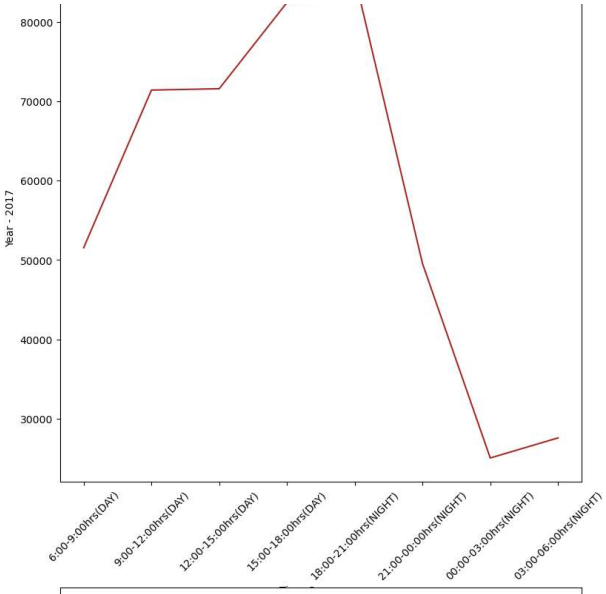
03:00-06:00hrs(NIGHT)


Year - 2017
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6:00-9:00hrs(DAY)
9:00-12:00hrs(DAY)
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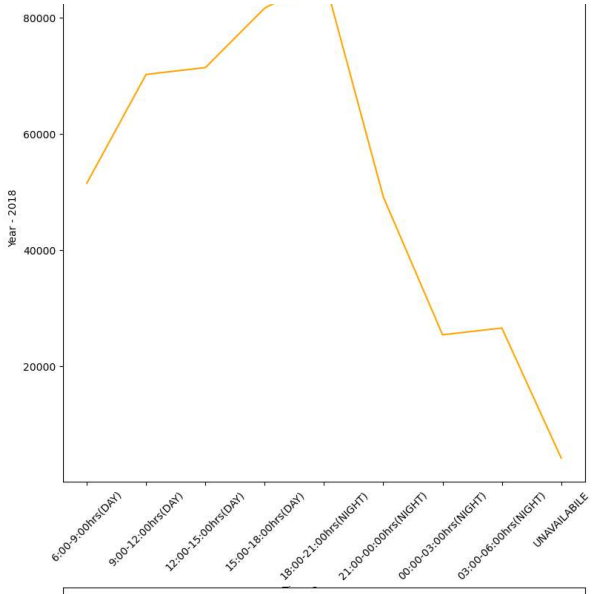
15:00-18:00hrs(DAY)
18:00-21:00hrs(NIGHT)
21:00-00:00hrs(NIGHT)
00:00-03:00hrs(NIGHT)
03:00-06:00hrs(NIGHT)


Year - 2018
80000
60000
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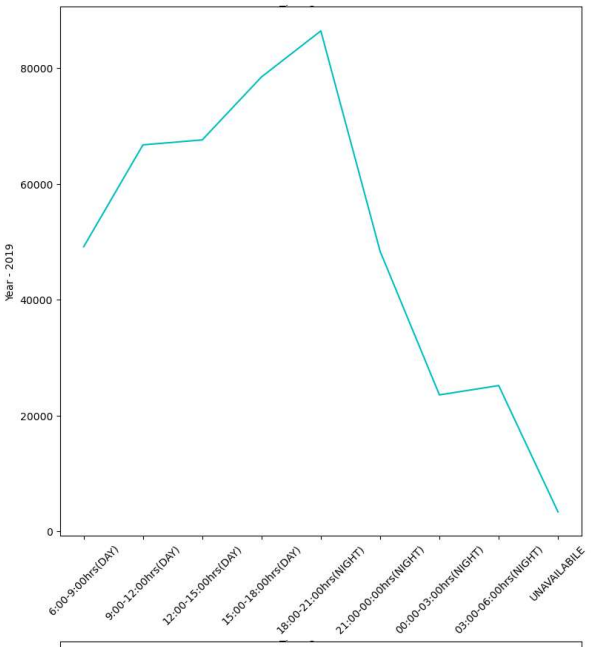
6:00-9:00hrs(DAY)
9:00-12:00hrs(DAY)
12:00-15:00hrs(DAY)
15:00-18:00hrs(DAY)
18:00-21:00hrs(NIGHT)
21:00-00:00hrs(NIGHT)
00:00-03:00hrs(NIGHT)
03:00-06:00hrs(NIGHT)
UNAVAILABLE


Year - 2019
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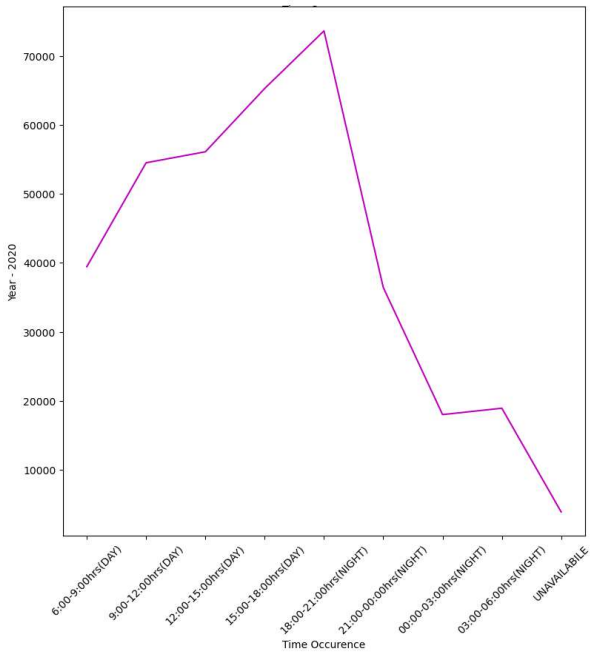
6:00-9:00hrs(DAY)
9:00-12:00hrs(DAY)
12:00-15:00hrs(DAY)
15:00-18:00hrs(DAY)
18:00-21:00hrs(NIGHT)
21:00-00:00hrs(NIGHT)
00:00-03:00hrs(NIGHT)
03:00-06:00hrs(NIGHT)
UNAVAILABLE


Year - 2020
70000
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6:00-9:00hrs(DAY)
9:00-12:00hrs(DAY)
12:00-15:00hrs(DAY)
15:00-18:00hrs(DAY)
18:00-21:00hrs(NIGHT)
21:00-00:00hrs(NIGHT)
00:00-03:00hrs(NIGHT)
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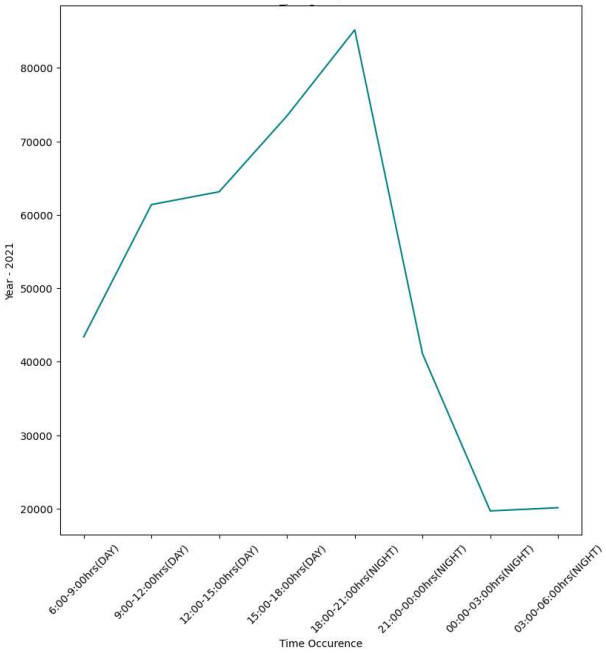
UNAVAILABLE
Time Occurence


Year - 2021
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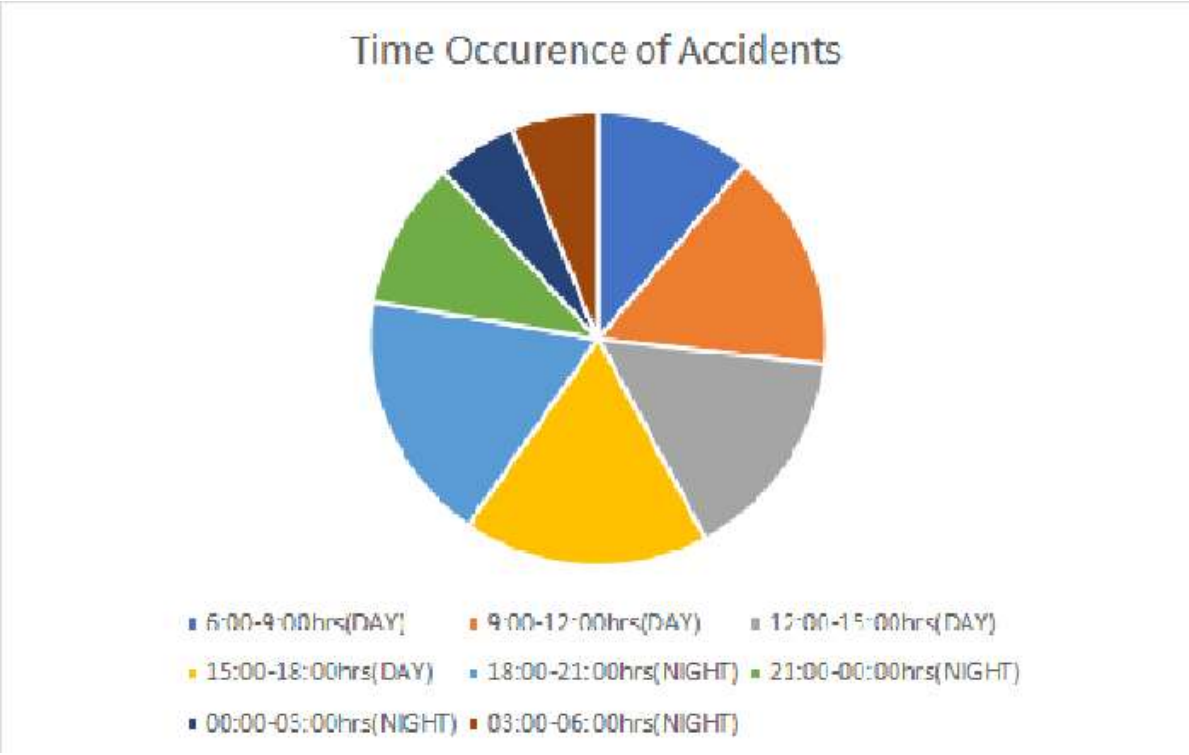
6:00-9:00hrs(DAY)
9:00-12:00hrs(DAY)
12:00-15:00hrs(DAY)
15:00-18:00hrs(DAY)
18:00-21:00hrs(NIGHT)
21:00-00:00hrs(NIGHT)
00:00-03:00hrs(NIGHT)
03:00-06:00hrs(NIGHT)
Time Occurence

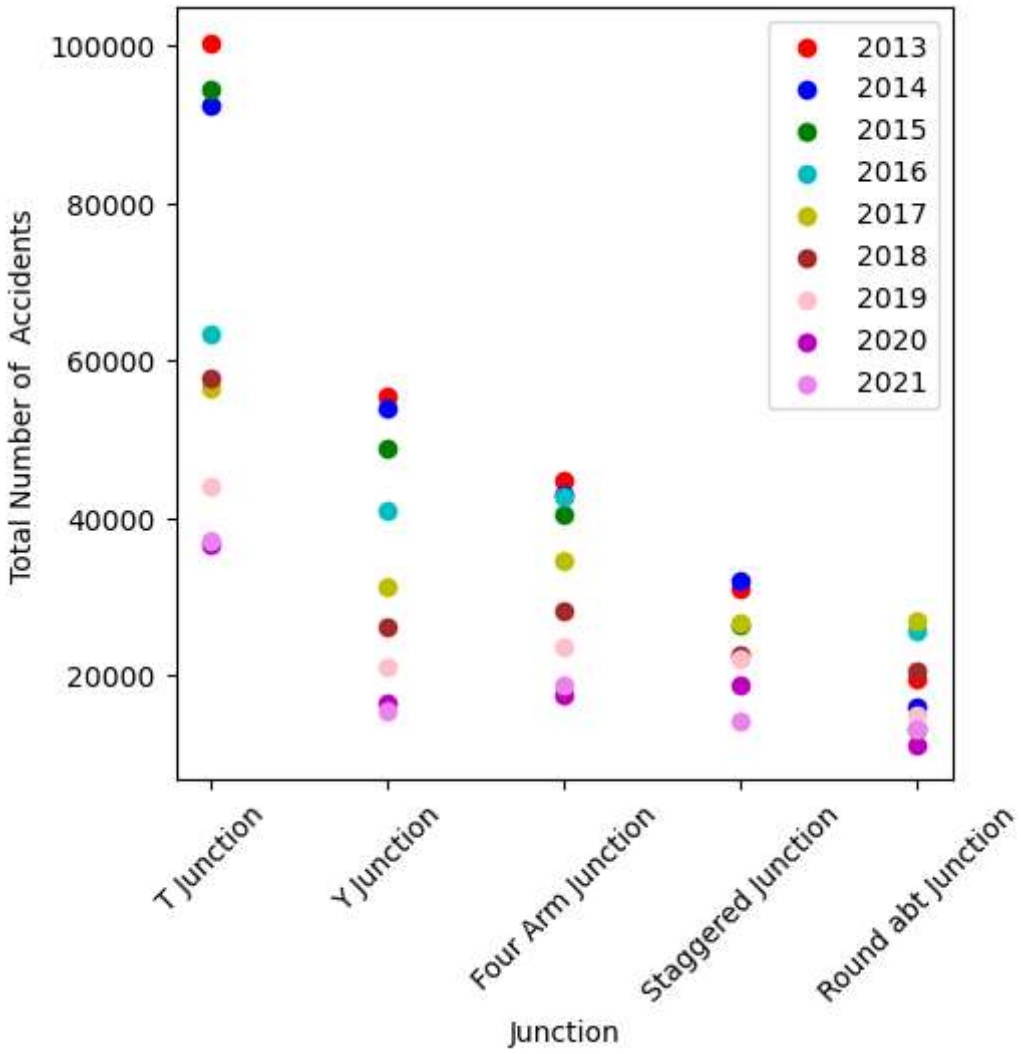


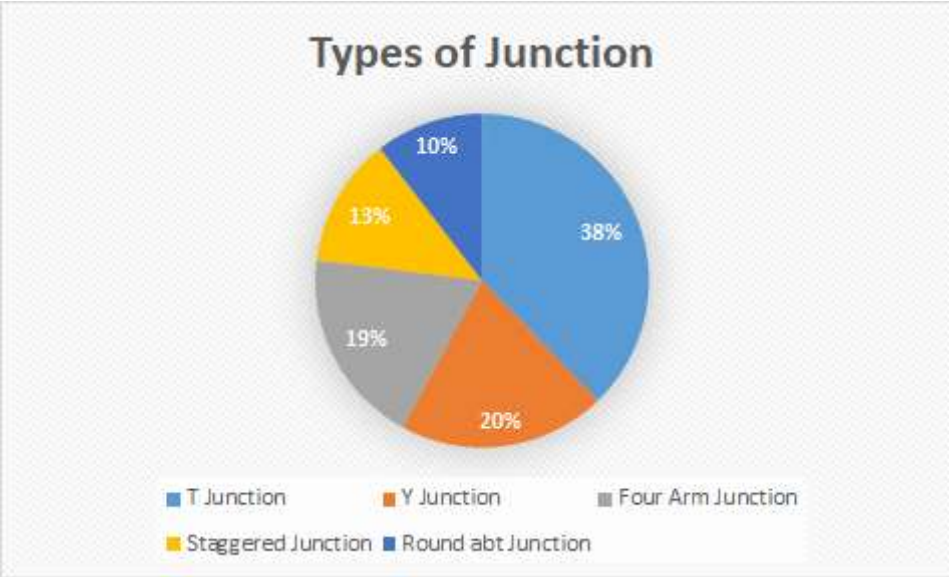
3. Types of Junctions

In [43]:
```
file = pd.read_excel('C:\\Users\\LENOVO\\Documents\\VIT\\Business Statistics\\SEM 2\\E
print(file)
plt.figure(figsize=(5,5))

x_axis = file['Junction']
y1_axis = file[2013]
y2_axis = file[2014]
y3_axis = file[2015]
y4_axis = file[2016]
y5_axis = file[2017]
y6_axis = file[2018]
y7_axis = file[2019]
y8_axis = file[2020]
y9_axis = file[2021]
plt.scatter(x_axis, y1_axis,color='r')
plt.scatter(x_axis,y2_axis,color ='b')
plt.scatter(x_axis,y3_axis,color ='g')
plt.scatter(x_axis,y4_axis,color ='c')
plt.scatter(x_axis,y5_axis,color ='y')
plt.scatter(x_axis,y6_axis,color ='brown')
plt.scatter(x_axis,y7_axis,color ='pink')
plt.scatter(x_axis,y8_axis,color ='m')
plt.scatter(x_axis,y9_axis,color ='violet')
plt.xlabel("Junction")
plt.ylabel("Total Number of  Accidents")
plt.xticks(rotation = 45)
plt.legend(["2013", "2014","2015","2016","2017","2018","2019","2020","2021"], loc ="up
```

```
              Junction    2013   2014   2015     2016   2017   2018   2019  \
0          T Junction  100271  92411  94487  63243.0  56363  57652  43864
1          Y Junction   55536  54017  48776  41006.0  31249  26220  21046
2    Four Arm Junction   44704  42891  40430  42829.0  34630  28125  23490
3   Staggered Junction   30913  32124  26491      NaN  26695  22557  22098
4   Round abt Junction   19614  15999  13276  25612.0  26916  20515  15000

     2020   2021
0  36471  37020
1  16438  15527
2  17611  18703
3  18713  14111
4  11161  13210
```

Out[43]: <matplotlib.legend.Legend at 0x1ac385a1a60>



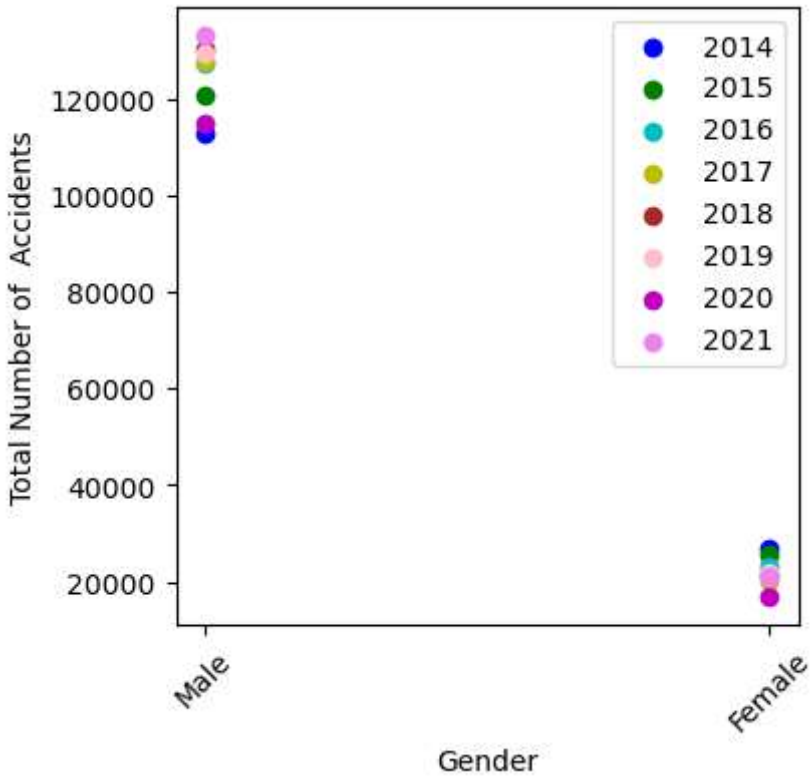


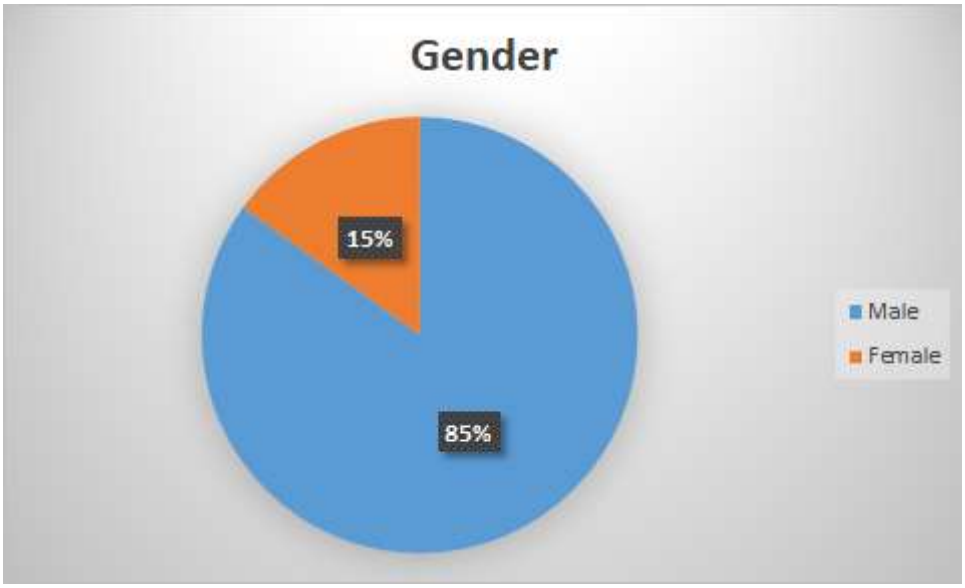
4. Based On Gender

In [49]:
```
file = pd.read_excel('C:\\Users\\LENOVO\\Documents\\VIT\\Business Statistics\\SEM 2\\E
print(file)
plt.figure(figsize=(4,4))

x_axis = ['Male','Female']
y1_axis = file[2014]
y2_axis = file[2015]
y3_axis = file[2016]
y4_axis = file[2017]
y5_axis = file[2018]
y6_axis = file[2019]
y7_axis = file[2020]
y8_axis = file[2021]
plt.scatter(x_axis,y1_axis,color ='b')
plt.scatter(x_axis,y2_axis,color ='g')
plt.scatter(x_axis,y3_axis,color ='c')
plt.scatter(x_axis,y4_axis,color ='y')
plt.scatter(x_axis,y5_axis,color ='brown')
plt.scatter(x_axis,y6_axis,color ='pink')
plt.scatter(x_axis,y7_axis,color ='m')
plt.scatter(x_axis,y8_axis,color ='violet')
plt.xlabel("Gender")
plt.ylabel("Total Number of  Accidents")
plt.xticks(rotation = 45)
plt.legend([ "2014","2015","2016","2017","2018","2019","2020","2021"], loc ="upper rig
```

```
  Gender     2014    2015    2016    2017    2018    2019    2020    2021
0   Male   112863  120626  127453  127788  130144  129319  114933  133025
1  Female   26808   25507   23332   20047   21273   21794   16781   20947
```

Out[49]:
```
<matplotlib.legend.Legend at 0x1ac380ec9d0>
```





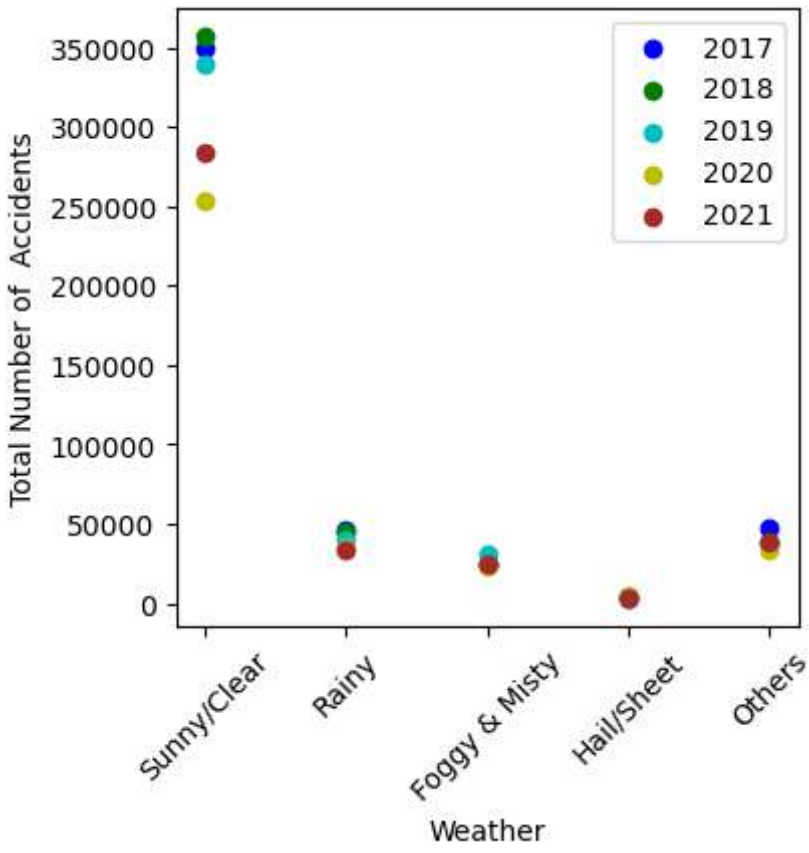
5. Based on Weather

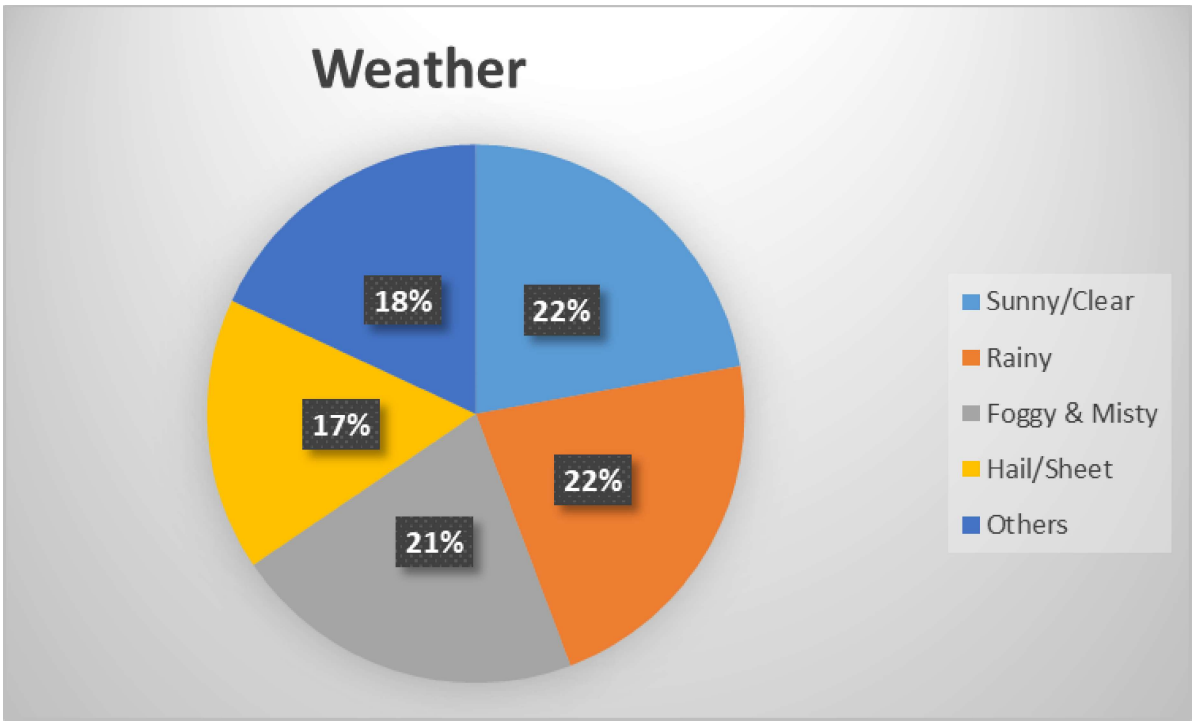
In [52]:
```
file = pd.read_excel('C:\\Users\\LENOVO\\Documents\\VIT\\Business Statistics\\SEM 2\\E
print(file)
plt.figure(figsize=(4,4))

x_axis = file['Weather']
y1_axis = file[2017]
y2_axis = file[2018]
y3_axis = file[2019]
y4_axis = file[2020]
y5_axis = file[2021]
plt.scatter(x_axis,y1_axis,color ='b')
plt.scatter(x_axis,y2_axis,color ='g')
```

```
plt.scatter(x_axis,y3_axis,color ='c')
plt.scatter(x_axis,y4_axis,color ='y')
plt.scatter(x_axis,y5_axis,color ='brown')
plt.xlabel("Weather")
plt.ylabel("Total Number of  Accidents")
plt.xticks(rotation = 45)
plt.legend([ "2017","2018","2019","2020","2021"], loc ="upper right")
```

```
         Weather    2017    2018    2019    2020    2021
0    Sunny/Clear  349597  356594  339636  253421  284176
1          Rainy   46004   45010   39573   34552   33416
2  Foggy & Misty   24828   25265   30776   23111   25360
3     Hail/Sheet    2888    4080    3945    4074    3296
4         Others   47658   38469   37431   33121   38200
```

Out[52]: <matplotlib.legend.Legend at 0x1ac3b72e100>




Weather
18%
22%
17%
22%
21%
Sunny/Clear
Rainy
Foggy & Misty
Hail/Sheet
Others