```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
from scipy import stats

road_accidents = pd.read_csv("D:/6.Data Analytics/data sets/Road Accident Data.csv",
                             header = 0, sep = ',')

pd.set_option('display.max_column',None) #to get all the columns
print(road_accidents.head())
```

IDLE Shell 3.11.3

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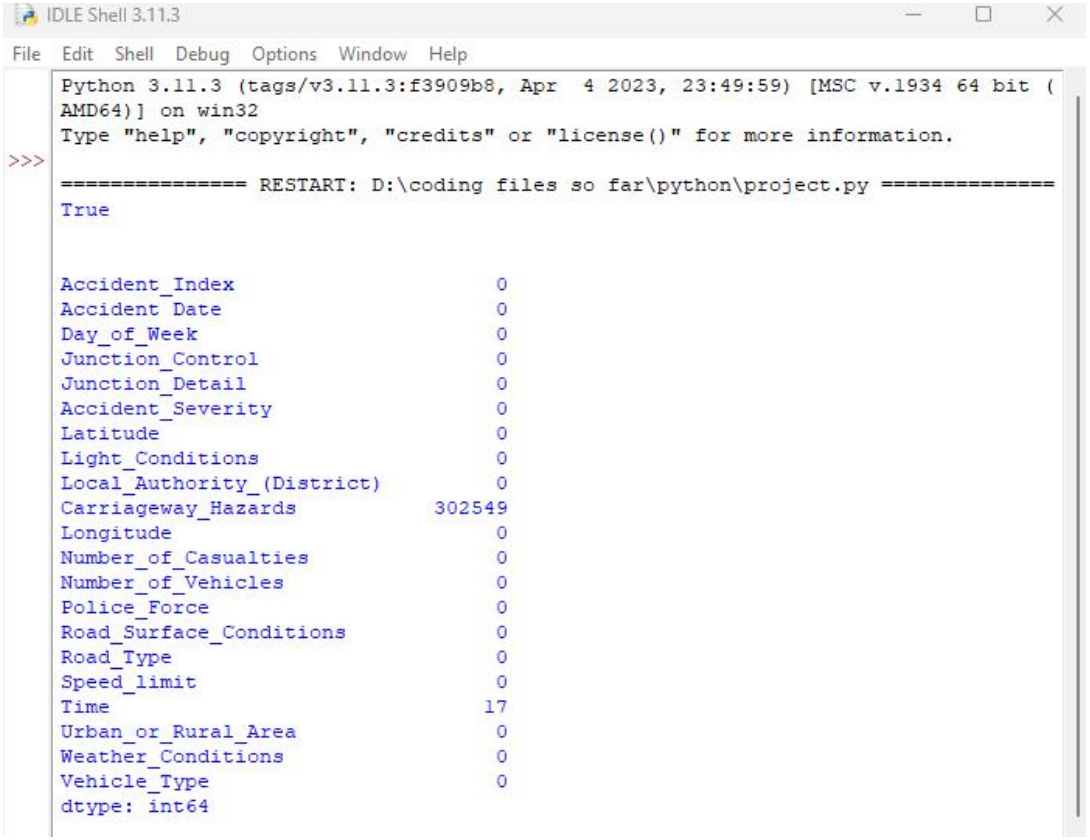
```
  Accident_Index Accident Date Day_of_Week          Junction_Control  \
0      BS0000001    01-01-2021    Thursday  Give way or uncontrolled
1      BS0000002    05-01-2021      Monday  Give way or uncontrolled
2      BS0000003    04-01-2021      Sunday  Give way or uncontrolled
3      BS0000004    05-01-2021      Monday       Auto traffic signal
4      BS0000005    06-01-2021     Tuesday       Auto traffic signal

           Junction_Detail Accident_Severity   Latitude  \
0  T or staggered junction           Serious  51.512273
1              Crossroads           Serious  51.514399
2  T or staggered junction            Slight  51.486668
3  T or staggered junction           Serious  51.507804
4              Crossroads           Serious  51.482076

       Light_Conditions Local_Authority_(District) Carriageway_Hazards  \
0              Daylight     Kensington and Chelsea                 NaN
1              Daylight     Kensington and Chelsea                 NaN
2              Daylight     Kensington and Chelsea                 NaN
3              Daylight     Kensington and Chelsea                 NaN
4  Darkness - lights lit     Kensington and Chelsea                 NaN

   Longitude  Number_of_Casualties  Number_of_Vehicles         Police_Force  \
0  -0.201349                     1                   2  Metropolitan Police
1  -0.199248                    11                   2  Metropolitan Police
2  -0.179599                     1                   2  Metropolitan Police
3  -0.203110                     1                   2  Metropolitan Police
4  -0.173445                     1                   2  Metropolitan Police

  Road_Surface_Conditions          Road_Type  Speed_limit   Time  \
0                     Dry      One way street           30  15:11
1           Wet or damp  Single carriageway           30  10:59
2                     Dry  Single carriageway           30  14:19
3            Frost or ice  Single carriageway           30  08:10
4                     Dry  Single carriageway           30  17:25

  Urban_or_Rural_Area  Weather_Conditions          Vehicle_Type
0              Urban  Fine no high winds                   Car
1              Urban  Fine no high winds  Taxi/Private hire car
2              Urban  Fine no high winds  Taxi/Private hire car
3              Urban               Other  Motorcycle over 500cc
4              Urban  Fine no high winds                   Car
```

```
# Checking whether are there any NA contain columns

print(road_accidents.isna().any().any())
print("\n")

#What are those by columns

print(road_accidents.isna().sum())
print("\n")
```




```
Accident_Index                0
Accident Date                 0
Day_of_Week                   0
Junction_Control              0
Junction_Detail               0
Accident_Severity             0
Latitude                      0
Light_Conditions              0
Local_Authority_(District)    0
Longitude                     0
Number_of_Casualties          0
Number_of_Vehicles            0
Police_Force                  0
Road_Surface_Conditions       0
Road_Type                     0
Speed_limit                   0
Urban_or_Rural_Area           0
Weather_Conditions            0
Vehicle_Type                  0
dtype: int64
>>>
```

```
road_accidents.dropna(axis = 1, inplace = True)
print(road_accidents.isna().sum())
```

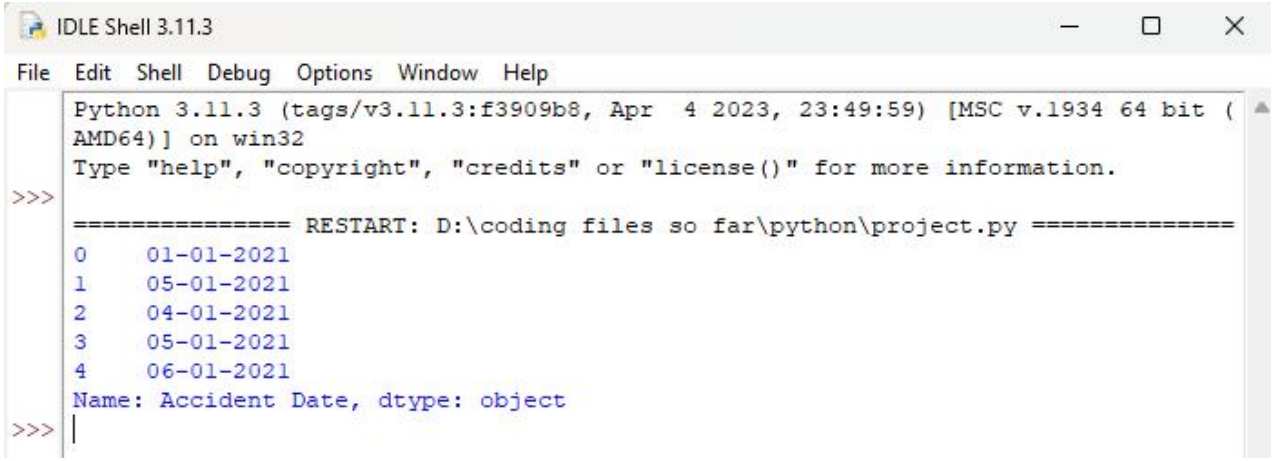
```
#checking the data types

print(road_accidents.info())
```

```
print(road_accidents.describe())
```

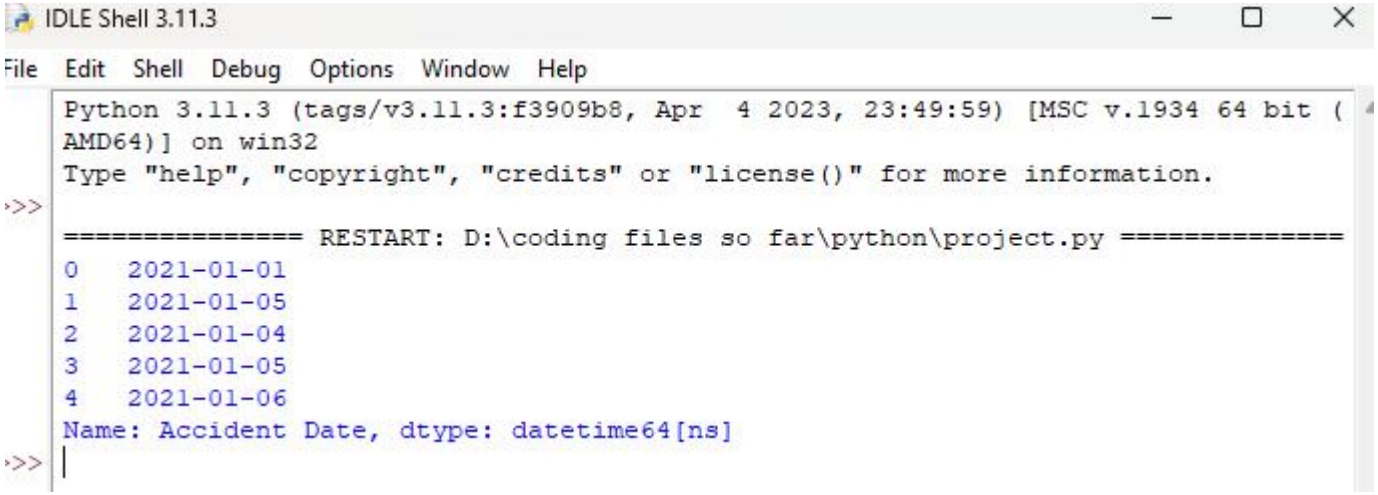
```
>>>
============== RESTART: D:\coding files so far\python\project.py ==============
            Latitude      Longitude  Number_of_Casualties  Number_of_Vehicles  \
count  307973.000000  307973.000000         307973.000000       307973.000000
mean       52.487005      -1.368884              1.356882            1.829063
std         1.339011       1.356092              0.815857            0.710477
min        49.914488      -7.516225              1.000000            1.000000
25%        51.485248      -2.247937              1.000000            1.000000
50%        52.225943      -1.349258              1.000000            2.000000
75%        53.415517      -0.206810              1.000000            2.000000
max        60.598055       1.759398             48.000000           32.000000

         Speed_limit
count  307973.000000
mean       38.866037
std        14.032933
min        10.000000
25%        30.000000
50%        30.000000
75%        50.000000
max        70.000000
>>>
```

#converting the Accident Date data type: object to data type: datetime

```
print(road_accidents["Accident Date"].head())
```



```
road_accidents["Accident Date"] = pd.to_datetime(road_accidents["Accident Date"], format='%d-%m-%Y',errors = 'coerce')
print("\n")
print(road_accidents["Accident Date"].head())
```



#plot1:

```
number_of_accidents = road_accidents.groupby("Accident Date").size().reset_index(name='Num of Acci_1')
pd.set_option('display.max_row',None)
print(number_of_accidents)
plt.scatter(number_of_accidents["Accident Date"], number_of_accidents["Num of Acci_1"])
plt.title("NUMBER OF ACCIDENTS BY DATE", fontsize = 15)
plt.xlabel("Date")
plt.ylabel("Number of Accidents")
plt.show()
```

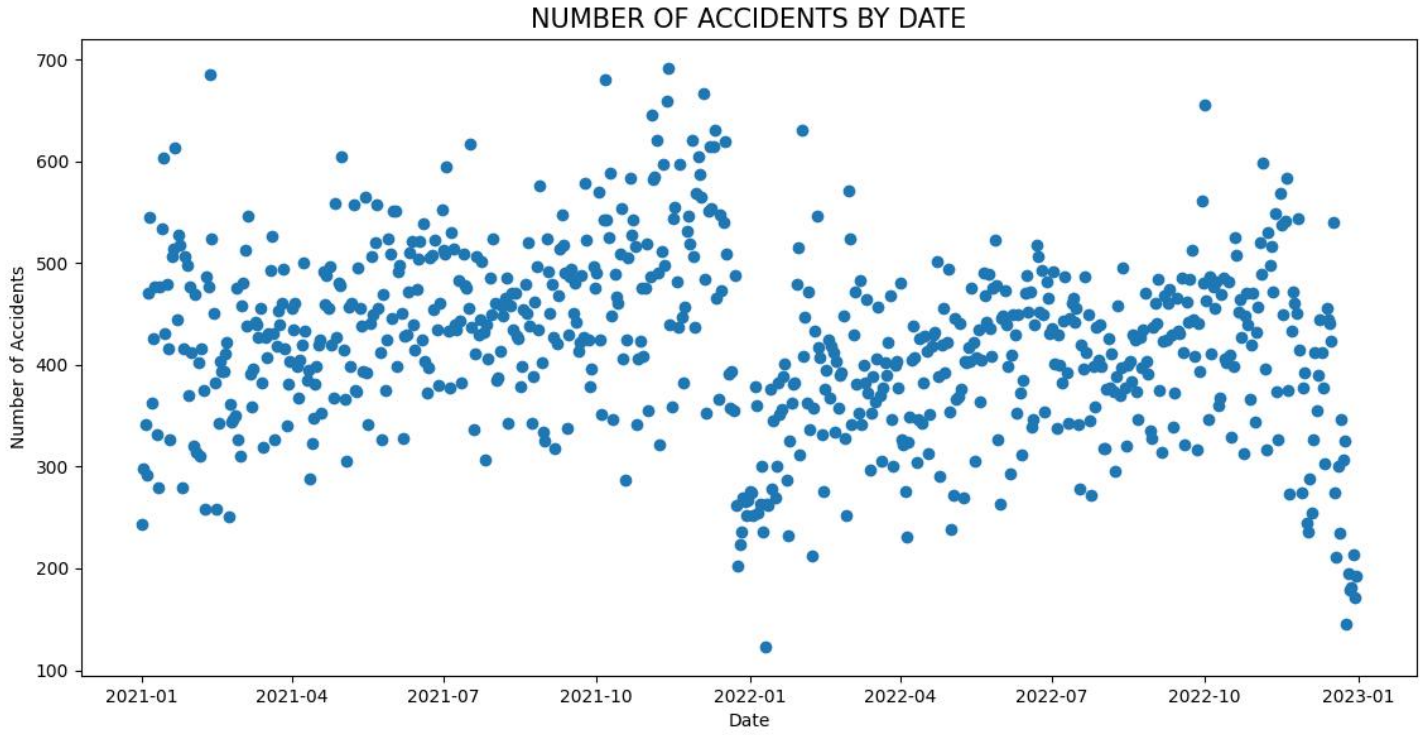
Accident Date	Num of Acci_1											
0	2021-01-01	244	19	2021-01-20	514	39	2021-02-09	487	59	2021-03-01	311	79	2021-03-21	431
1	2021-01-02	298	20	2021-01-21	613	40	2021-02-10	477	60	2021-03-02	458	80	2021-03-22	326
2	2021-01-03	341	21	2021-01-22	444	41	2021-02-11	685	61	2021-03-03	480	81	2021-03-23	418
			22	2021-01-23	528	42	2021-02-12	524	62	2021-03-04	513	82	2021-03-24	453

3	2021-01-04	292	23	2021-01-24	518	43	2021-02-13	451	63	2021-03-05	438	83	2021-03-25	439
4	2021-01-05	471	24	2021-01-25	280	44	2021-02-14	383	64	2021-03-06	546	84	2021-03-26	460
5	2021-01-06	545	25	2021-01-26	416	45	2021-02-15	258	65	2021-03-07	391	85	2021-03-27	494
6	2021-01-07	363	26	2021-01-27	506	46	2021-02-16	343	66	2021-03-08	359	86	2021-03-28	416
7	2021-01-08	426	27	2021-01-28	498	47	2021-02-17	403	67	2021-03-09	396	87	2021-03-29	340
8	2021-01-09	477	28	2021-01-29	370	48	2021-02-18	394	68	2021-03-10	442	88	2021-03-30	381
9	2021-01-10	332	29	2021-01-30	477	49	2021-02-19	394	69	2021-03-11	439	89	2021-03-31	403
10	2021-01-11	279	30	2021-01-31	412	50	2021-02-20	411	70	2021-03-12	427	90	2021-04-01	456
11	2021-01-12	477	31	2021-02-01	320	51	2021-02-21	422	71	2021-03-13	456	91	2021-04-02	434
12	2021-01-13	534	32	2021-02-02	469	52	2021-02-22	251	72	2021-03-14	382	92	2021-04-03	461
13	2021-01-14	603	33	2021-02-03	314	53	2021-02-23	361	73	2021-03-15	319	93	2021-04-04	398
14	2021-01-15	431	34	2021-02-04	402	54	2021-02-24	344	74	2021-03-16	427	94	2021-04-05	368
15	2021-01-16	479	35	2021-02-05	311	55	2021-02-25	346	75	2021-03-17	407	95	2021-04-06	405
16	2021-01-17	416	36	2021-02-06	416	56	2021-02-26	350	76	2021-03-18	431	96	2021-04-07	420
17	2021-01-18	327	37	2021-02-07	375	57	2021-02-27	475	77	2021-03-19	493	97	2021-04-08	500
18	2021-01-19	506	38	2021-02-08	258	58	2021-02-28	326	78	2021-03-20	526	98	2021-04-09	433
99	2021-04-10	385	141	2021-05-22	557	183	2021-07-03	594	225	2021-08-14	428	267	2021-09-25	523
100	2021-04-11	395	142	2021-05-23	455	184	2021-07-04	433	226	2021-08-15	426	268	2021-09-26	424
101	2021-04-12	288	143	2021-05-24	412	185	2021-07-05	378	227	2021-08-16	379	269	2021-09-27	379
102	2021-04-13	323	144	2021-05-25	327	186	2021-07-06	530	228	2021-08-17	398	270	2021-09-28	396
103	2021-04-14	348	145	2021-05-26	469	187	2021-07-07	514	229	2021-08-18	454	271	2021-09-29	496
104	2021-04-15	381	146	2021-05-27	375	188	2021-07-08	440	230	2021-08-19	479	272	2021-09-30	476
105	2021-04-16	399	147	2021-05-28	425	189	2021-07-09	435	231	2021-08-20	451	273	2021-10-01	490
106	2021-04-17	420	148	2021-05-29	524	190	2021-07-10	483	232	2021-08-21	520	274	2021-10-02	570
107	2021-04-18	425	149	2021-05-30	509	191	2021-07-11	443	233	2021-08-22	438	275	2021-10-03	425
108	2021-04-19	353	150	2021-05-31	446	192	2021-07-12	383	234	2021-08-23	343	276	2021-10-04	351
109	2021-04-20	492	151	2021-06-01	551	193	2021-07-13	509	235	2021-08-24	389	277	2021-10-05	542
110	2021-04-21	459	152	2021-06-02	551	194	2021-07-14	478	236	2021-08-25	462	278	2021-10-06	680
111	2021-04-22	488	153	2021-06-03	398	195	2021-07-15	476	237	2021-08-26	496	279	2021-10-07	543
112	2021-04-23	455	154	2021-06-04	491	196	2021-07-16	456	238	2021-08-27	435	280	2021-10-08	525
113	2021-04-24	497	155	2021-06-05	498	197	2021-07-17	617	239	2021-08-28	576	281	2021-10-09	589
114	2021-04-25	420	156	2021-06-06	451	198	2021-07-18	437	240	2021-08-29	402	282	2021-10-10	448
115	2021-04-26	367	157	2021-06-07	328	199	2021-07-19	337	241	2021-08-30	334	283	2021-10-11	347
116	2021-04-27	559	158	2021-06-08	428	200	2021-07-20	411	242	2021-08-31	325	284	2021-10-12	489
117	2021-04-28	427	159	2021-06-09	429	201	2021-07-21	506	243	2021-09-01	524	285	2021-10-13	467
118	2021-04-29	481	160	2021-06-10	472	202	2021-07-22	429	244	2021-09-02	492	286	2021-10-14	461
119	2021-04-30	478	161	2021-06-11	510	203	2021-07-23	445	245	2021-09-03	451	287	2021-10-15	509
120	2021-05-01	605	162	2021-06-12	521	204	2021-07-24	501	246	2021-09-04	479	288	2021-10-16	554
121	2021-05-02	415	163	2021-06-13	439	205	2021-07-25	432	247	2021-09-05	427	289	2021-10-17	406
122	2021-05-03	366	164	2021-06-14	415	206	2021-07-26	307	248	2021-09-06	318	290	2021-10-18	287
123	2021-05-04	305	165	2021-06-15	474	207	2021-07-27	439	249	2021-09-07	421	291	2021-10-19	424
124	2021-05-05	457	166	2021-06-16	504	208	2021-07-28	406	250	2021-09-08	468	292	2021-10-20	505

125	2021-05-06	399	167	2021-06-17	522	209	2021-07-29	486	251	2021-09-09	514	293	2021-10-21	584
126	2021-05-07	460	168	2021-06-18	425	210	2021-07-30	449	252	2021-09-10	547	294	2021-10-22	528
127	2021-05-08	558	169	2021-06-19	539	211	2021-07-31	524	253	2021-09-11	518	295	2021-10-23	543
128	2021-05-09	375	170	2021-06-20	404	212	2021-08-01	461	254	2021-09-12	490	296	2021-10-24	517
129	2021-05-10	374	171	2021-06-21	372	213	2021-08-02	385	255	2021-09-13	338	297	2021-10-25	342
130	2021-05-11	495	172	2021-06-22	397	214	2021-08-03	387	256	2021-09-14	429	298	2021-10-26	406
131	2021-05-12	456	173	2021-06-23	505	215	2021-08-04	414	257	2021-09-15	487	299	2021-10-27	423
132	2021-05-13	438	174	2021-06-24	508	216	2021-08-05	458	258	2021-09-16	494	300	2021-10-28	475
133	2021-05-14	394	175	2021-06-25	454	217	2021-08-06	448	259	2021-09-17	451	301	2021-10-29	409
134	2021-05-15	565	176	2021-06-26	523	218	2021-08-07	465	260	2021-09-18	480	302	2021-10-30	476
135	2021-05-16	392	177	2021-06-27	435	219	2021-08-08	485	261	2021-09-19	442	303	2021-10-31	519
136	2021-05-17	341	178	2021-06-28	380	220	2021-08-09	343	262	2021-09-20	413	304	2021-11-01	355
137	2021-05-18	441	179	2021-06-29	460	221	2021-08-10	458	263	2021-09-21	422	305	2021-11-02	487
138	2021-05-19	507	180	2021-06-30	552	222	2021-08-11	471	264	2021-09-22	488	306	2021-11-03	646
139	2021-05-20	449	181	2021-07-01	513	223	2021-08-12	434	265	2021-09-23	427	307	2021-11-04	582
140	2021-05-21	520	182	2021-07-02	509	224	2021-08-13	471	266	2021-09-24	578	308	2021-11-05	585
309	2021-11-06	621	351	2021-12-18	509	393	2022-01-29	479	435	2022-03-12	464	477	2022-04-23	501
310	2021-11-07	490	352	2021-12-19	391	394	2022-01-30	515	436	2022-03-13	372	478	2022-04-24	389
311	2021-11-08	321	353	2021-12-20	358	395	2022-01-31	312	437	2022-03-14	297	479	2022-04-25	291
312	2021-11-09	511	354	2021-12-21	394	396	2022-02-01	631	438	2022-03-15	353	480	2022-04-26	420
313	2021-11-10	597	355	2021-12-22	355	397	2022-02-02	408	439	2022-03-16	388	481	2022-04-27	455
314	2021-11-11	498	356	2021-12-23	488	398	2022-02-03	447	440	2022-03-17	364	482	2022-04-28	392
315	2021-11-12	659	357	2021-12-24	262	399	2022-02-04	363	441	2022-03-18	406	483	2022-04-29	422
316	2021-11-13	692	358	2021-12-25	202	400	2022-02-05	472	442	2022-03-19	457	484	2022-04-30	494
317	2021-11-14	439	359	2021-12-26	224	401	2022-02-06	336	443	2022-03-20	370	485	2022-05-01	354
318	2021-11-15	359	360	2021-12-27	236	402	2022-02-07	213	444	2022-03-21	305	486	2022-05-02	239
319	2021-11-16	544	361	2021-12-28	269	403	2022-02-08	358	445	2022-03-22	377	487	2022-05-03	272
320	2021-11-17	555	362	2021-12-29	266	404	2022-02-09	433	446	2022-03-23	402	488	2022-05-04	446
321	2021-11-18	482	363	2021-12-30	252	405	2022-02-10	546	447	2022-03-24	390	489	2022-05-05	366
322	2021-11-19	437	364	2021-12-31	267	406	2022-02-11	417	448	2022-03-25	422	490	2022-05-06	369
323	2021-11-20	597	365	2022-01-01	276	407	2022-02-12	407	449	2022-03-26	468	491	2022-05-07	441
324	2021-11-21	447	366	2022-01-02	274	408	2022-02-13	331	450	2022-03-27	346	492	2022-05-08	376
325	2021-11-22	382	367	2022-01-03	252	409	2022-02-14	276	451	2022-03-28	301	493	2022-05-09	270
326	2021-11-23	457	368	2022-01-04	379	410	2022-02-15	376	452	2022-03-29	400	494	2022-05-10	404
327	2021-11-24	531	369	2022-01-05	360	411	2022-02-16	395	453	2022-03-30	403	495	2022-05-11	402
328	2021-11-25	546	370	2022-01-06	254	412	2022-02-17	424	454	2022-03-31	378	496	2022-05-12	417
329	2021-11-26	519	371	2022-01-07	263	413	2022-02-18	367	455	2022-04-01	480	497	2022-05-13	403
330	2021-11-27	621	372	2022-01-08	301	414	2022-02-19	419	456	2022-04-02	327	498	2022-05-14	475
331	2021-11-28	507	373	2022-01-09	236	415	2022-02-20	412	457	2022-04-03	321	499	2022-05-15	422
332	2021-11-29	437	374	2022-01-10	123	416	2022-02-21	334	458	2022-04-04	276	500	2022-05-16	306
333	2021-11-30	569	375	2022-01-11	263	417	2022-02-22	403	459	2022-04-05	231	501	2022-05-17	407
334	2021-12-01	605	376	2022-01-12	262	418	2022-02-23	357	460	2022-04-06	324	502	2022-05-18	434

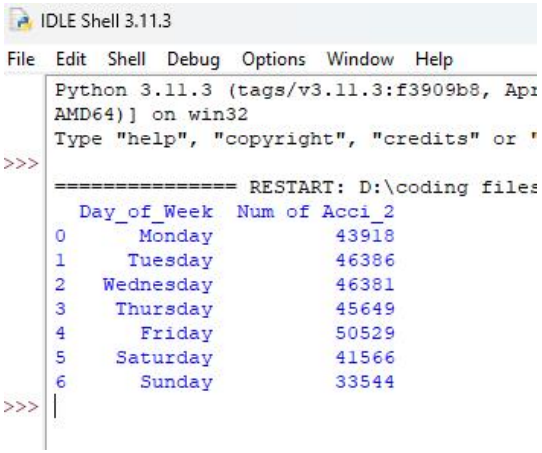
335	2021-12-02	587	377	2022-01-13	376	419	2022-02-24	390	461	2022-04-07	349	503	2022-05-19	364
336	2021-12-03	565	378	2022-01-14	278	420	2022-02-25	392	462	2022-04-08	405	504	2022-05-20	405
337	2021-12-04	667	379	2022-01-15	345	421	2022-02-26	448	463	2022-04-09	438	505	2022-05-21	490
338	2021-12-05	484	380	2022-01-16	269	422	2022-02-27	328	464	2022-04-10	407	506	2022-05-22	468
339	2021-12-06	353	381	2022-01-17	300	423	2022-02-28	252	465	2022-04-11	304	507	2022-05-23	442
340	2021-12-07	551	382	2022-01-18	383	424	2022-03-01	571	466	2022-04-12	347	508	2022-05-24	489
341	2021-12-08	614	383	2022-01-19	351	425	2022-03-02	524	467	2022-04-13	426	509	2022-05-25	436
342	2021-12-09	554	384	2022-01-20	356	426	2022-03-03	341	468	2022-04-14	343	510	2022-05-26	409
343	2021-12-10	614	385	2022-01-21	389	427	2022-03-04	430	469	2022-04-15	383	511	2022-05-27	476
344	2021-12-11	630	386	2022-01-22	401	428	2022-03-05	472	470	2022-04-16	428	512	2022-05-28	523
345	2021-12-12	465	387	2022-01-23	287	429	2022-03-06	381	471	2022-04-17	413	513	2022-05-29	478
346	2021-12-13	366	388	2022-01-24	232	430	2022-03-07	352	472	2022-04-18	313	514	2022-05-30	326
347	2021-12-14	548	389	2022-01-25	325	431	2022-03-08	483	473	2022-04-19	351	515	2022-05-31	263
348	2021-12-15	473	390	2022-01-26	362	432	2022-03-09	341	474	2022-04-20	418	516	2022-06-01	446
349	2021-12-16	540	391	2022-01-27	381	433	2022-03-10	400	475	2022-04-21	430	517	2022-06-02	448
350	2021-12-17	620	392	2022-01-28	383	434	2022-03-11	383	476	2022-04-22	432	518	2022-06-03	473
519	2022-06-04	439	561	2022-07-16	455	603	2022-08-27	404	645	2022-10-08	482	687	2022-11-19	584
520	2022-06-05	398	562	2022-07-17	342	604	2022-08-28	391	646	2022-10-09	360	688	2022-11-20	375
521	2022-06-06	293	563	2022-07-18	278	605	2022-08-29	335	647	2022-10-10	367	689	2022-11-21	273
522	2022-06-07	410	564	2022-07-19	420	606	2022-08-30	328	648	2022-10-11	469	690	2022-11-22	433
523	2022-06-08	449	565	2022-07-20	396	607	2022-08-31	437	649	2022-10-12	486	691	2022-11-23	472
524	2022-06-09	429	566	2022-07-21	487	608	2022-09-01	460	650	2022-10-13	406	692	2022-11-24	460
525	2022-06-10	352	567	2022-07-22	412	609	2022-09-02	441	651	2022-10-14	402	693	2022-11-25	451
526	2022-06-11	449	568	2022-07-23	449	610	2022-09-03	484	652	2022-10-15	482	694	2022-11-26	544
527	2022-06-12	372	569	2022-07-24	345	611	2022-09-04	375	653	2022-10-16	410	695	2022-11-27	415
528	2022-06-13	312	570	2022-07-25	272	612	2022-09-05	314	654	2022-10-17	329	696	2022-11-28	274
529	2022-06-14	385	571	2022-07-26	399	613	2022-09-06	423	655	2022-10-18	399	697	2022-11-29	377
530	2022-06-15	470	572	2022-07-27	359	614	2022-09-07	468	656	2022-10-19	525	698	2022-11-30	392
531	2022-06-16	488	573	2022-07-28	437	615	2022-09-08	424	657	2022-10-20	508	699	2022-12-01	245
532	2022-06-17	452	574	2022-07-29	405	616	2022-09-09	460	658	2022-10-21	452	700	2022-12-02	236
533	2022-06-18	472	575	2022-07-30	440	617	2022-09-10	474	659	2022-10-22	464	701	2022-12-03	288
534	2022-06-19	339	576	2022-07-31	399	618	2022-09-11	429	660	2022-10-23	427	702	2022-12-04	255
535	2022-06-20	346	577	2022-08-01	318	619	2022-09-12	339	661	2022-10-24	313	703	2022-12-05	326
536	2022-06-21	439	578	2022-08-02	318	620	2022-09-13	373	662	2022-10-25	448	704	2022-12-06	412
537	2022-06-22	518	579	2022-08-03	376	621	2022-09-14	465	663	2022-10-26	470	705	2022-12-07	355
538	2022-06-23	506	580	2022-08-04	426	622	2022-09-15	433	664	2022-10-27	439	706	2022-12-08	390
539	2022-06-24	452	581	2022-08-05	377	623	2022-09-16	431	665	2022-10-28	366	707	2022-12-09	444
540	2022-06-25	493	582	2022-08-06	411	624	2022-09-17	486	666	2022-10-29	420	708	2022-12-10	412
541	2022-06-26	449	583	2022-08-07	374	625	2022-09-18	412	667	2022-10-30	471	709	2022-12-11	378
542	2022-06-27	354	584	2022-08-08	295	626	2022-09-19	322	668	2022-10-31	344	710	2022-12-12	303
543	2022-06-28	482	585	2022-08-09	388	627	2022-09-20	462	669	2022-11-01	432	711	2022-12-13	455
544	2022-06-29	466	586	2022-08-10	458	628	2022-09-21	442	670	2022-11-02	457	712	2022-12-14	444

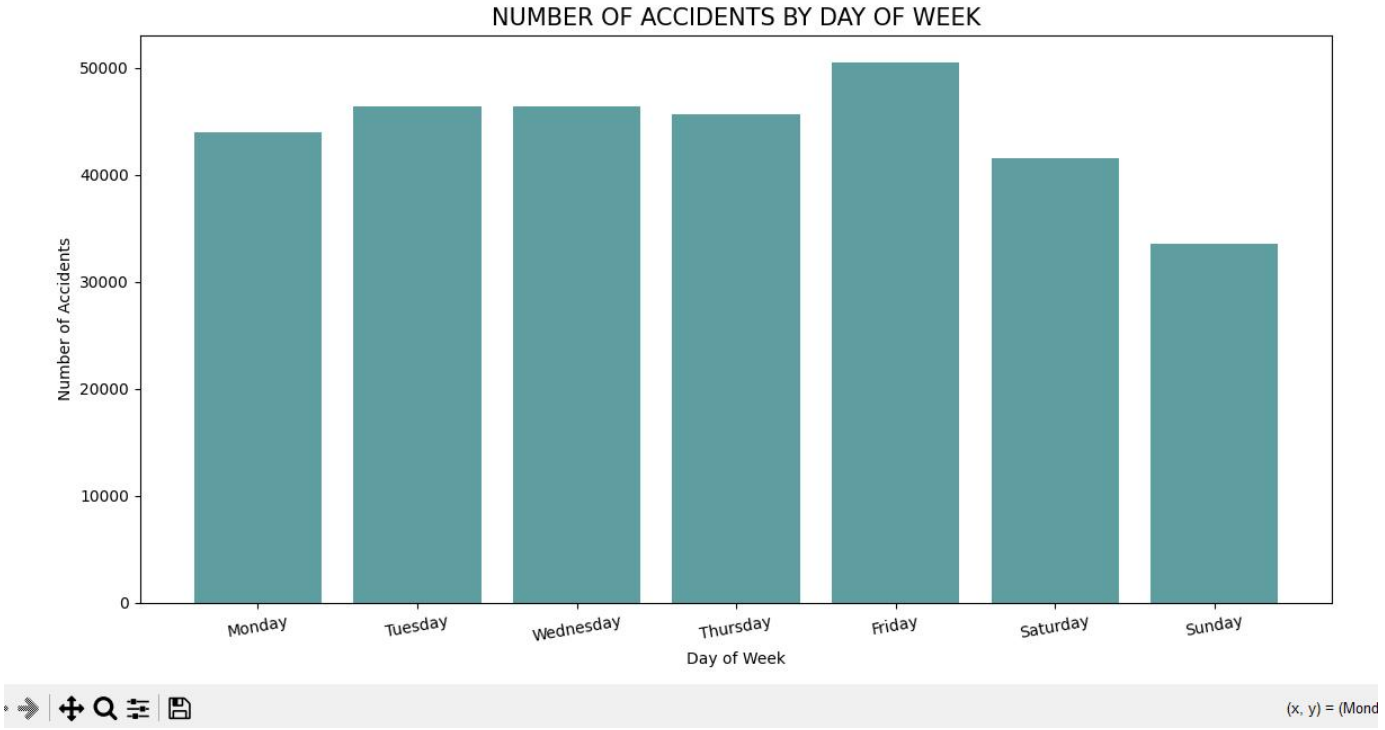
545	2022-06-30	431	587	2022-08-11	370	629	2022-09-22	484	671	2022-11-03	520	713	2022-12-15	441
546	2022-07-01	436	588	2022-08-12	397	630	2022-09-23	513	672	2022-11-04	489	714	2022-12-16	423
547	2022-07-02	492	589	2022-08-13	495	631	2022-09-24	445	673	2022-11-05	598	715	2022-12-17	540
548	2022-07-03	401	590	2022-08-14	378	632	2022-09-25	408	674	2022-11-06	396	716	2022-12-18	274
549	2022-07-04	338	591	2022-08-15	320	633	2022-09-26	317	675	2022-11-07	317	717	2022-12-19	211
550	2022-07-05	429	592	2022-08-16	400	634	2022-09-27	441	676	2022-11-08	530	718	2022-12-20	301
551	2022-07-06	400	593	2022-08-17	404	635	2022-09-28	393	677	2022-11-09	498	719	2022-12-21	235
552	2022-07-07	382	594	2022-08-18	384	636	2022-09-29	561	678	2022-11-10	517	720	2022-12-22	347
553	2022-07-08	443	595	2022-08-19	430	637	2022-09-30	481	679	2022-11-11	472	721	2022-12-23	307
554	2022-07-09	487	596	2022-08-20	425	638	2022-10-01	656	680	2022-11-12	549	722	2022-12-24	325
555	2022-07-10	392	597	2022-08-21	374	639	2022-10-02	463	681	2022-11-13	374	723	2022-12-25	145
556	2022-07-11	343	598	2022-08-22	346	640	2022-10-03	346	682	2022-11-14	327	724	2022-12-26	195
557	2022-07-12	446	599	2022-08-23	427	641	2022-10-04	487	683	2022-11-15	568	725	2022-12-27	179
558	2022-07-13	461	600	2022-08-24	397	642	2022-10-05	411	684	2022-11-16	537	726	2022-12-28	181
559	2022-07-14	466	601	2022-08-25	435	643	2022-10-06	477	685	2022-11-17	450	727	2022-12-29	214
560	2022-07-15	442	602	2022-08-26	470	644	2022-10-07	455	686	2022-11-18	541	728	2022-12-30	171
729	2022-12-31	193												



#plot2:

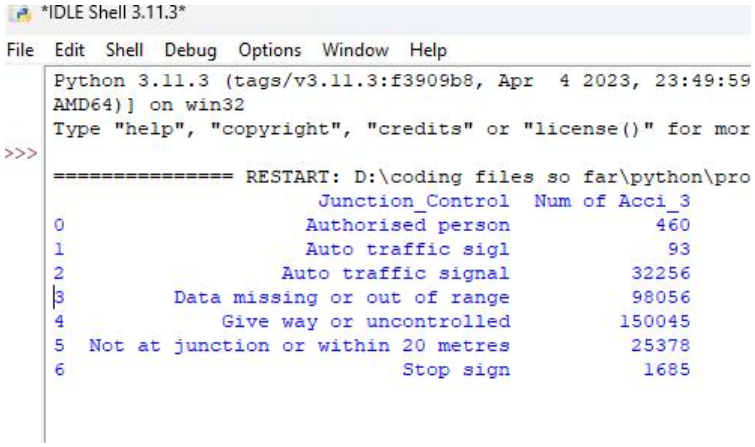
```
day_order = ["Monday","Tuesday","Wednesday","Thursday","Friday","Saturday","Sunday"]
acci_by_day = road_accidents.groupby("Day_of_Week").size().reindex(day_order).reset_index(name = 'Num of Acci_2')
print(acci_by_day)
plt.bar(acci_by_day["Day_of_Week"], acci_by_day["Num of Acci_2"],color = 'cadetblue')
plt.xticks(rotation = 10)
plt.title("NUMBER OF ACCIDENTS BY DAY OF WEEK", fontsize = 15)
plt.xlabel("Day of Week")
plt.ylabel("Number of Accidents")
plt.show()
```

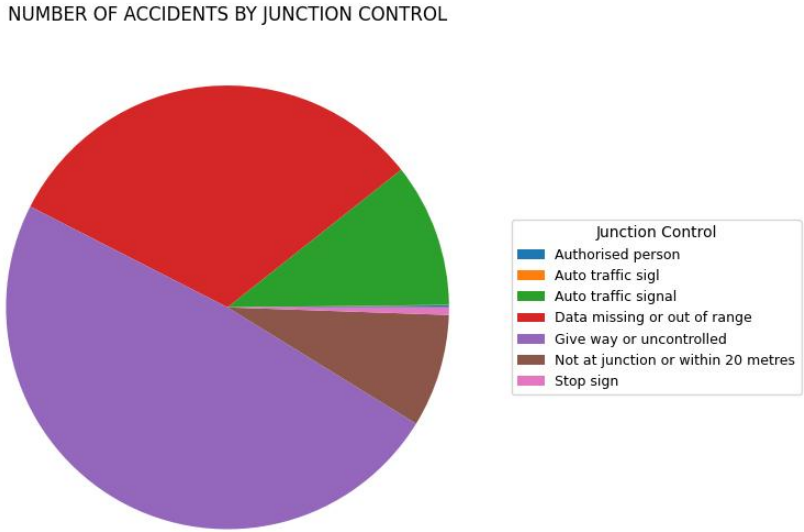




#plot3:

```
acci_by_junction_control = road_accidents.groupby("Junction_Control").size().reset_index(name='Num of Acci_3')
print(acci_by_junction_control)
a = acci_by_junction_control["Num of Acci_3"]
plt.pie(a)
plt.legend(acci_by_junction_control["Junction_Control"],loc = "center left",bbox_to_anchor=(1,0.5), fontsize = 9, title = "Junction Control")
plt.title("NUMBER OF ACCIDENTS BY JUNCTION CONTROL")

plt.show()
```

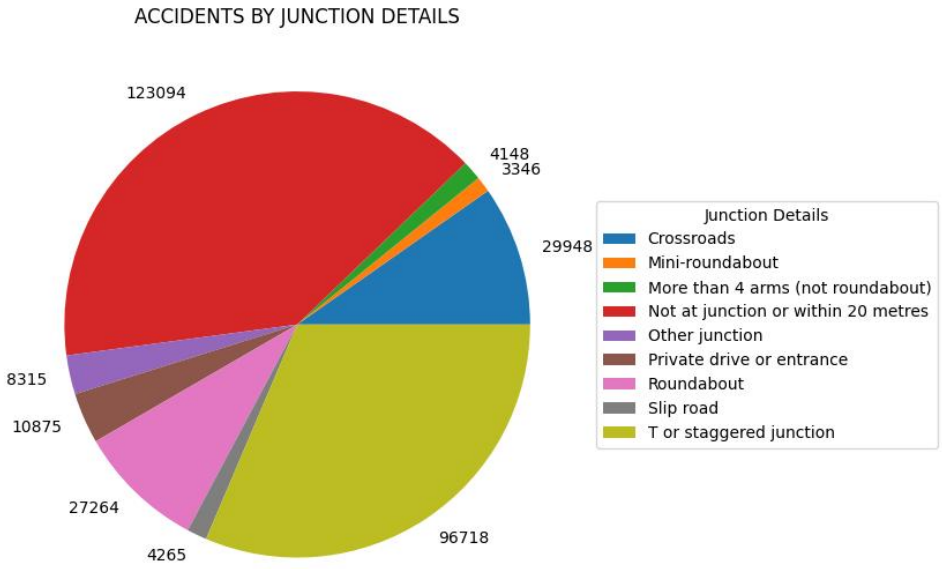




#plot4:

```
acci_by_junction_detail = road_accidents.groupby("Junction_Detail").size().reset_index(name='Num of Acci_4')
print(acci_by_junction_detail)
b = acci_by_junction_detail["Num of Acci_4"]
plt.pie(b, labels = acci_by_junction_detail["Num of Acci_4"])
plt.legend(acci_by_junction_detail["Junction_Detail"], loc = "center left", bbox_to_anchor=(1,0.5), title = "Junction Details")
plt.title("ACCIDENTS BY JUNCTION DETAILS")
plt.show()
```

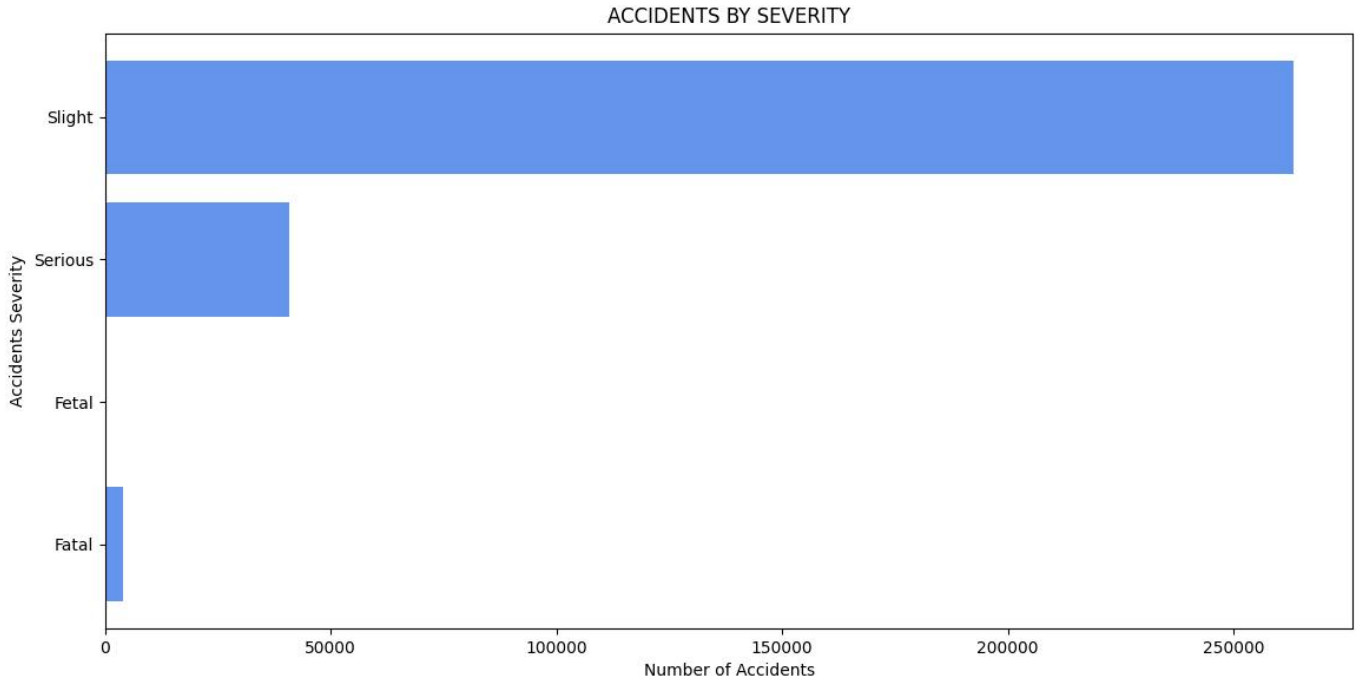
	Junction_Detail	Num of Acci_4
0	Crossroads	29948
1	Mini-roundabout	3346
2	More than 4 arms (not roundabout)	4148
3	Not at junction or within 20 metres	123094
4	Other junction	8315
5	Private drive or entrance	10875
6	Roundabout	27264
7	Slip road	4265
8	T or staggered junction	96718



#plot5:

```
acci_severity = road_accidents.groupby("Accident_Severity").size().reset_index(name = 'Num of Acci_5')
print(acci_severity)
plt.barh(acci_severity["Accident_Severity"],acci_severity["Num of Acci_5"], color = 'cornflowerblue')
plt.title("ACCIDENTS BY SEVERITY")
plt.xlabel("Number of Accidents")
plt.ylabel("Accidents Severity")
plt.show()
```

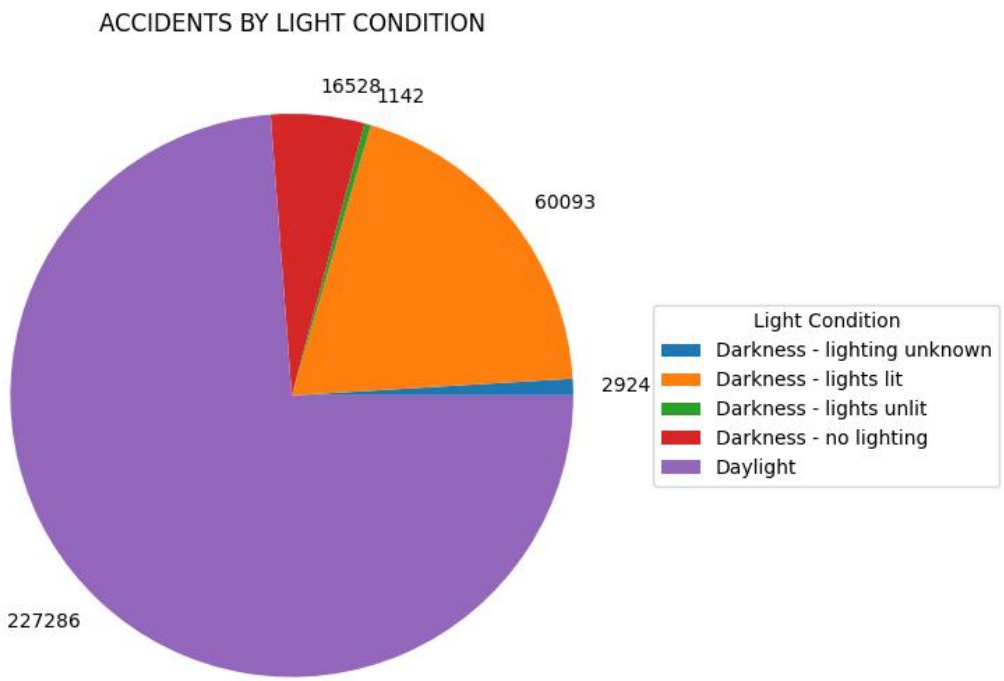
	Accident_Severity	Num of Acci_5
0	Fatal	3904
1	Fetal	49
2	Serious	40740
3	Slight	263280



#plot6:

```
acci_by_light_condition = road_accidents.groupby("Light_Conditions").size().reset_index(name = 'Num of Acci_6')
print(acci_by_light_condition)
a = acci_by_light_condition["Num of Acci_6"]
plt.pie(a, labels = acci_by_light_condition['Num of Acci_6'] )
plt.legend(acci_by_light_condition["Light_Conditions"],loc = "center left", bbox_to_anchor=(1,0.5),
           title = "Light Condition")
plt.title("ACCIDENTS BY LIGHT CONDITION")
plt.show()
```

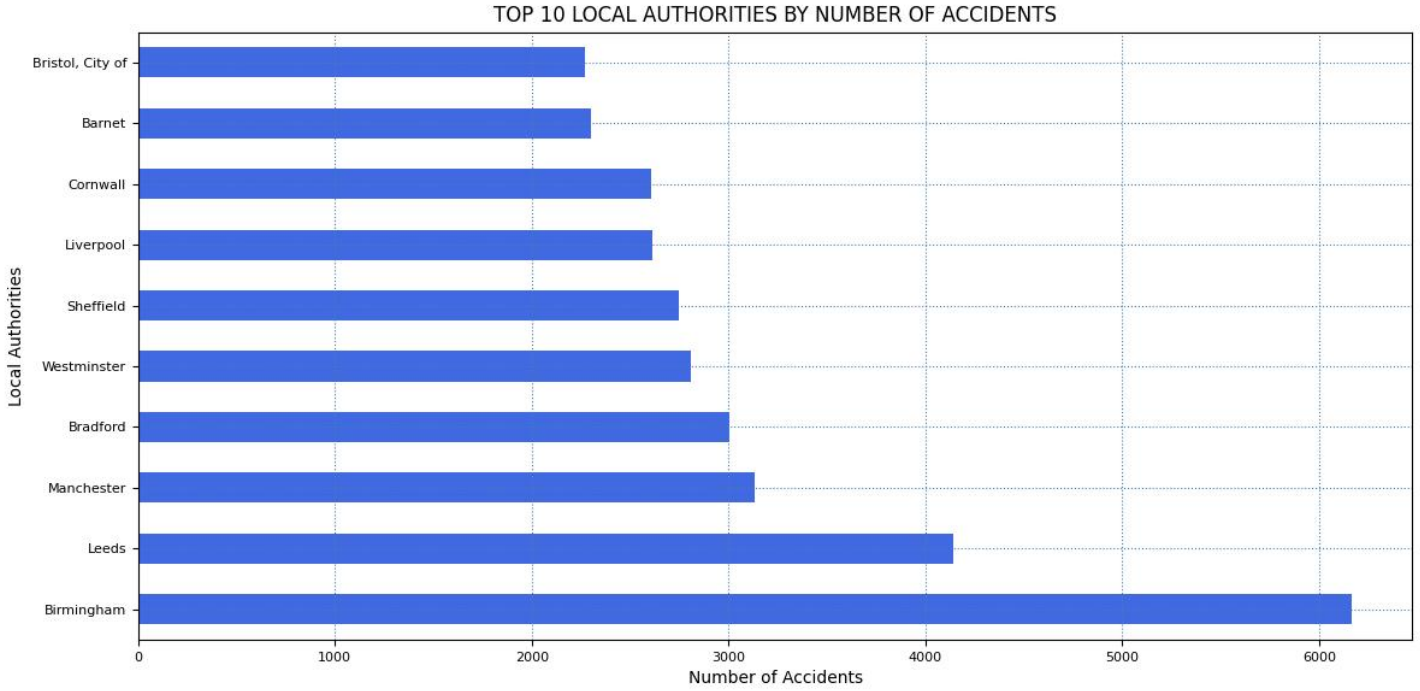
```
---------- RESTART: D:\coding files so far\
             Light_Conditions  Num of Acci_6
0  Darkness - lighting unknown           2924
1        Darkness - lights lit          60093
2      Darkness - lights unlit           1142
3       Darkness - no lighting          16528
4                    Daylight         227286
```



#plot7:

```
acci_by_local_authority = road_accidents.groupby("Local_Authority_(District)").size().sort_values(ascending=True)
print(acci_by_local_authority.head(10))
acci_by_local_authority.head(10).plot(kind = "barh", fontsize = 8, color = "royalblue")
plt.grid(color = "steelblue", linestyle = ":")
plt.title("TOP 10 LOCAL AUTHORITIES BY NUMBER OF ACCIDENTS")
plt.xlabel("Number of Accidents")
plt.ylabel("Local Authorities")

plt.show()
```

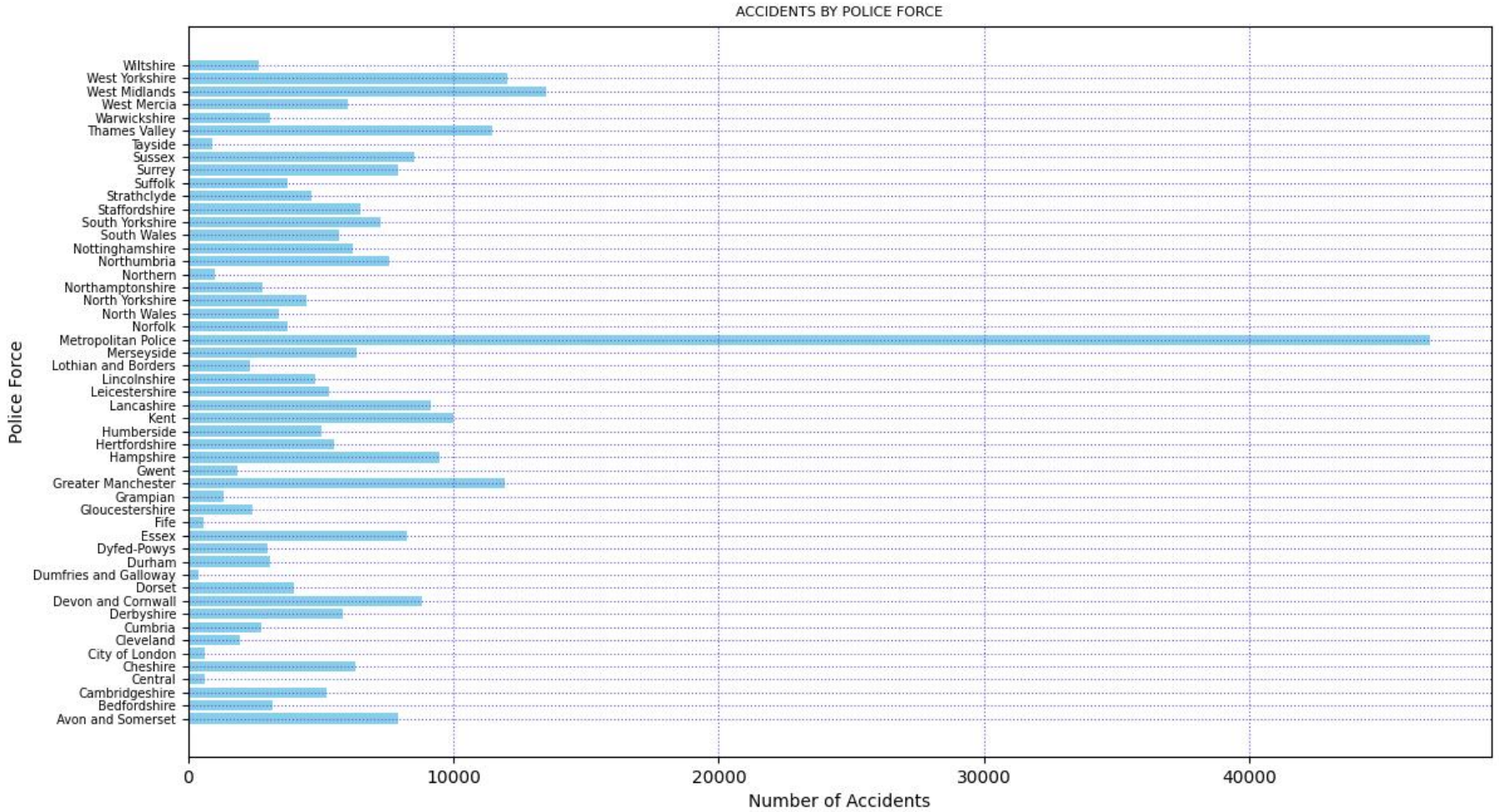
```
Local_Authority_(District)
Birmingham          6165
Leeds               4140
Manchester          3132
Bradford            3006
Westminster         2811
Sheffield           2750
Liverpool           2611
Cornwall            2606
Barnet              2302
Bristol, City of    2270
dtype: int64
```



#plot8:

```
acci_by_police_force = road_accidents.groupby("Police_Force").size().reset_index(name = 'Num of Acci_8')
print(acci_by_police_force)
plt.barh(acci_by_police_force["Police_Force"], acci_by_police_force["Num of Acci_8"],color = "skyblue")
plt.yticks(fontsize = 7)
plt.tight_layout()
plt.title("ACCIDENTS BY POLICE FORCE",fontsize = 8)
plt.xlabel("Number of Accidents")
plt.ylabel("Police Force")
plt.grid(linestyle = ":", color = "slateblue")

plt.show()
```

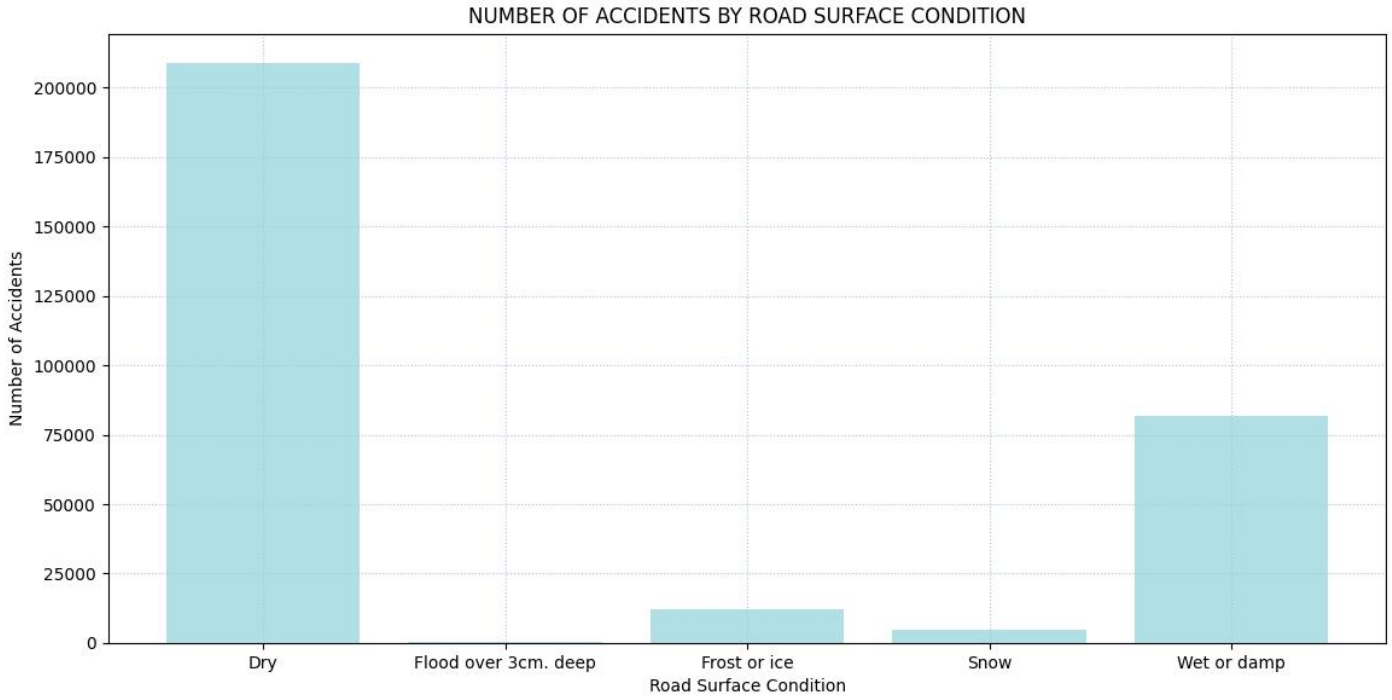
	Police_Force	Num of Acci_8
0	Avon and Somerset	7929
1	Bedfordshire	3184
2	Cambridgeshire	5219
3	Central	628
4	Cheshire	6288
5	City of London	635
6	Cleveland	1961
7	Cumbria	2755
8	Derbyshire	5818
9	Devon and Cornwall	8804
10	Dorset	3998
11	Dumfries and Galloway	388
12	Durham	3098
13	Dyfed-Powys	2996
14	Essex	8239
15	Fife	587
16	Gloucestershire	2400
17	Grampian	1329
18	Greater Manchester	11954
19	Gwent	1876
20	Hampshire	9492
21	Hertfordshire	5493
22	Humberside	5024
23	Kent	9995
24	Lancashire	9143
25	Leicestershire	5326
26	Lincolnshire	4780
27	Lothian and Borders	2344
28	Merseyside	6373
29	Metropolitan Police	46789
30	Norfolk	3758
31	North Wales	3419
32	North Yorkshire	4451
33	Northamptonshire	2803
34	Northern	1009
35	Northumbria	7557
36	Nottinghamshire	6223
37	South Wales	5685
38	South Yorkshire	7258
39	Staffordshire	6479
40	Strathclyde	4635
41	Suffolk	3759
42	Surrey	7897
43	Sussex	8548
44	Tayside	909
45	Thames Valley	11483
46	Warwickshire	3071
47	West Mercia	5995
48	West Midlands	13509
49	West Yorkshire	12016
50	Wiltshire	2664


ACCIDENTS BY POLICE FORCE
Police Force
Wiltshire
West Yorkshire
West Midlands
West Mercia
Warwickshire
Thames Valley
Tayside
Sussex
Surrey
Suffolk
Strathclyde
Staffordshire
South Yorkshire
South Wales
Nottinghamshire
Northumbria
Northern
Northamptonshire
North Yorkshire
North Wales
Norfolk
Metropolitan Police
Merseyside
Lothian and Borders
Lincolnshire
Leicestershire
Lancashire
Kent
Humberside
Hertfordshire
Hampshire
Gwent
Greater Manchester
Grampian
Gloucestershire
Fife
Essex
Dyfed-Powys
Durham
Dumfries and Galloway
Dorset
Devon and Cornwall
Derbyshire
Cumbria
Cleveland
City of London
Cheshire
Central
Cambridgeshire
Bedfordshire
Avon and Somerset
0
10000
20000
30000
40000
Number of Accidents

#plot9:

```
acci_by_road_surf_condition = road_accidents.groupby("Road_Surface_Conditions").size().reset_index(name='Num of Acci_9')
print(acci_by_road_surf_condition)
plt.bar(acci_by_road_surf_condition["Road_Surface_Conditions"],acci_by_road_surf_condition["Num of Acci_9"],color =
"powderblue")
plt.title("NUMBER OF ACCIDENTS BY ROAD SURFACE CONDITION")
plt.xlabel("Road Surface Condition")
plt.ylabel("Number of Accidents")
plt.grid(linestyle = ":", color = "lightsteelblue")
plt.show()
```

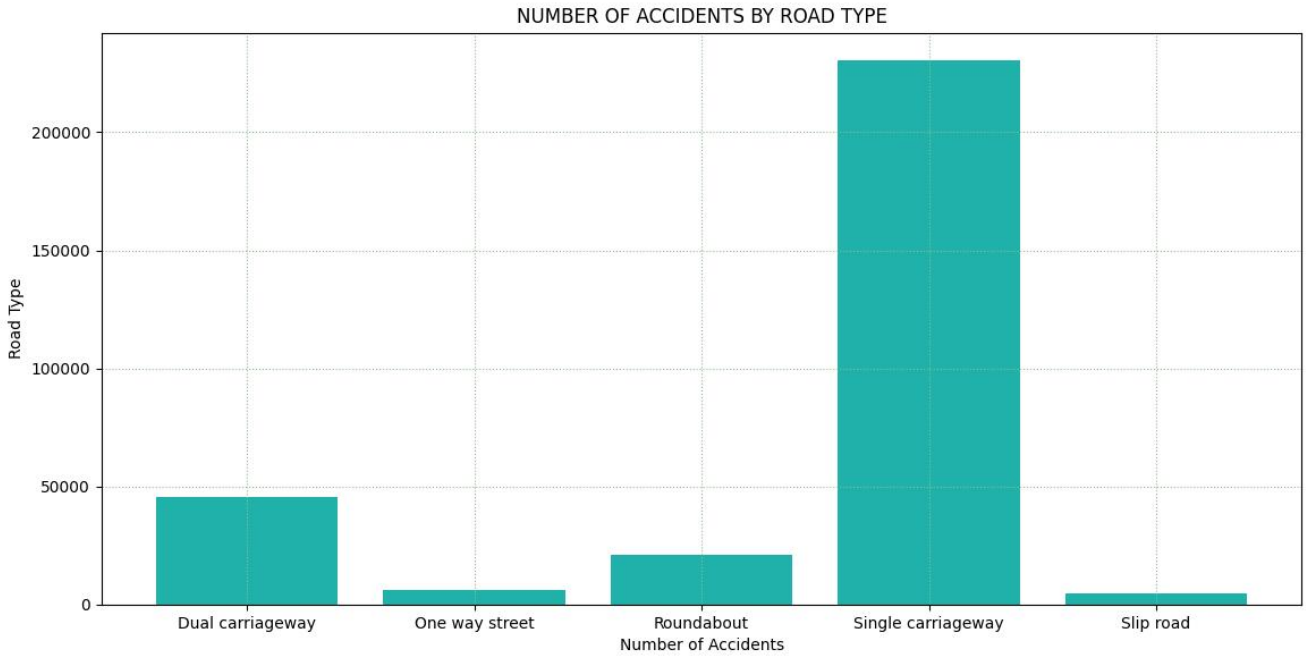
```
  Road_Surface_Conditions  Num of Acci_9
0                     Dry         208967
1    Flood over 3cm. deep            374
2            Frost or ice          12078
3                    Snow           4758
4             Wet or damp          81796
```



#plot10:

```
acci_by_road_type = road_accidents.groupby("Road_Type").size().reset_index(name = 'Num of Acci_10')
print(acci_by_road_type)
plt.bar(acci_by_road_type["Road_Type"],acci_by_road_type["Num of Acci_10"],color = "lightseagreen")
plt.title("NUMBER OF ACCIDENTS BY ROAD TYPE")
plt.xlabel("Number of Accidents")
plt.ylabel("Road Type")
plt.grid(linestyle = ":", color = "darkseagreen")
plt.show()
```

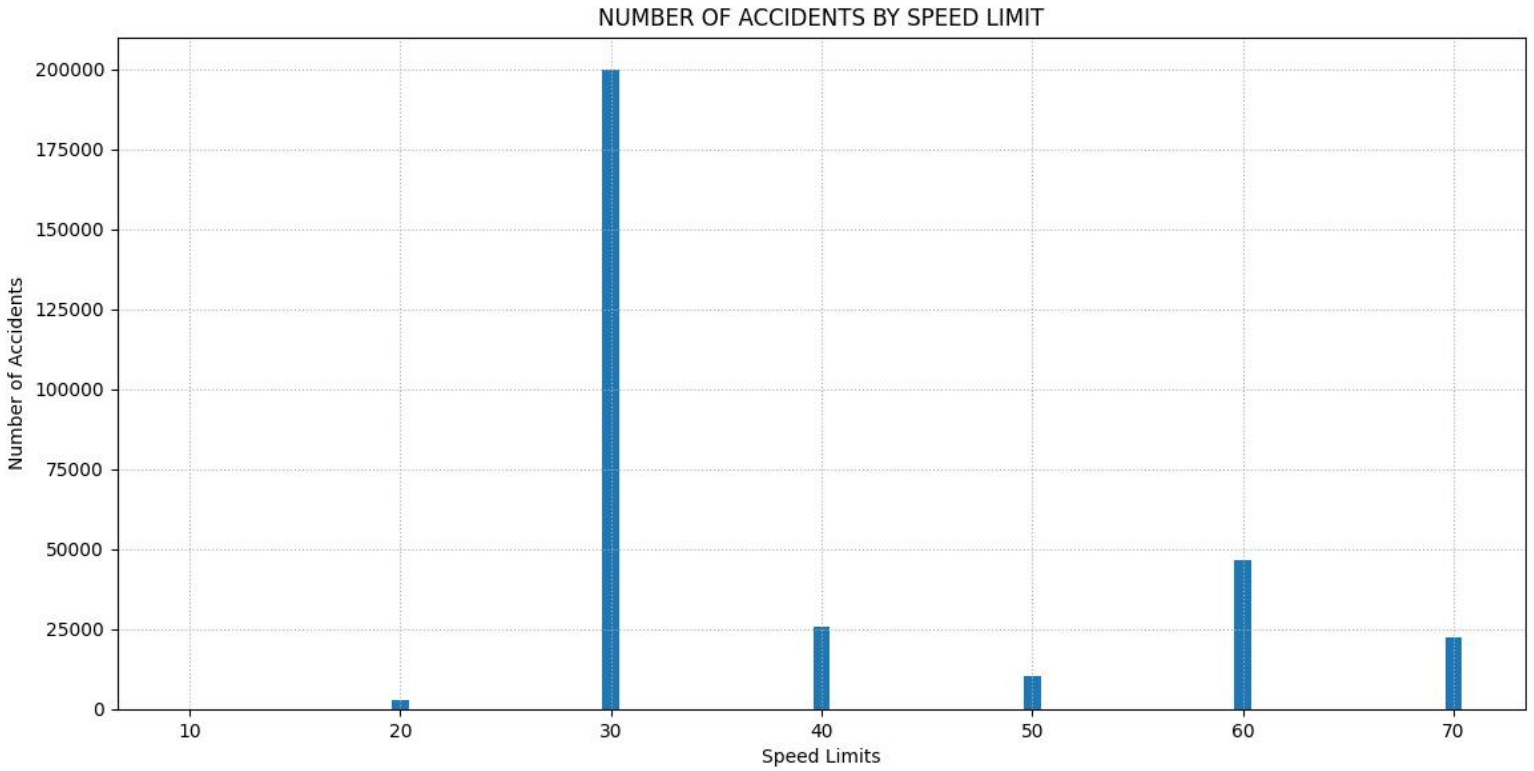
```
---------- RESTART: D:\Coding Files
            Road_Type  Num of Acci_10
0    Dual carriageway           45467
1      One way street            6197
2           Roundabout           20929
3  Single carriageway          230612
4           Slip road            4768
```



#plot11:

```
acci_by_speed_limit = road_accidents.groupby("Speed_limit").size().reset_index(name= 'Num of Acci_11')
print(acci_by_speed_limit)
plt.bar(acci_by_speed_limit["Speed_limit"], acci_by_speed_limit['Num of Acci_11'])
plt.title("NUMBER OF ACCIDENTS BY SPEED LIMIT")
plt.xlabel("Speed Limits")
plt.ylabel("Number of Accidents")
plt.grid(linestyle = ":")
plt.show()
```

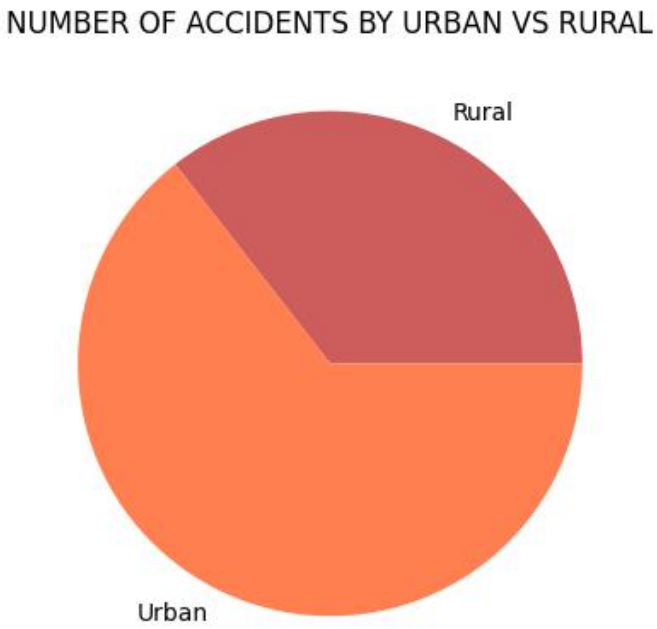
	Speed_limit	Num of Acci_11
0	10	3
1	15	2
2	20	2899
3	30	200040
4	40	25650
5	50	10191
6	60	46826
7	70	22362



#plot12:

```
acci_by_urban_rural = road_accidents.groupby("Urban_or_Rural_Area").size().reset_index(name='Num of Acci_12')
print(acci_by_urban_rural)
my_colors = ["indianred","coral"]
c = acci_by_urban_rural["Num of Acci_12"]
plt.pie(c, labels = acci_by_urban_rural["Urban_or_Rural_Area"],colors = my_colors)
plt.title("NUMBER OF ACCIDENTS BY URBAN VS RURAL")
plt.show()
```

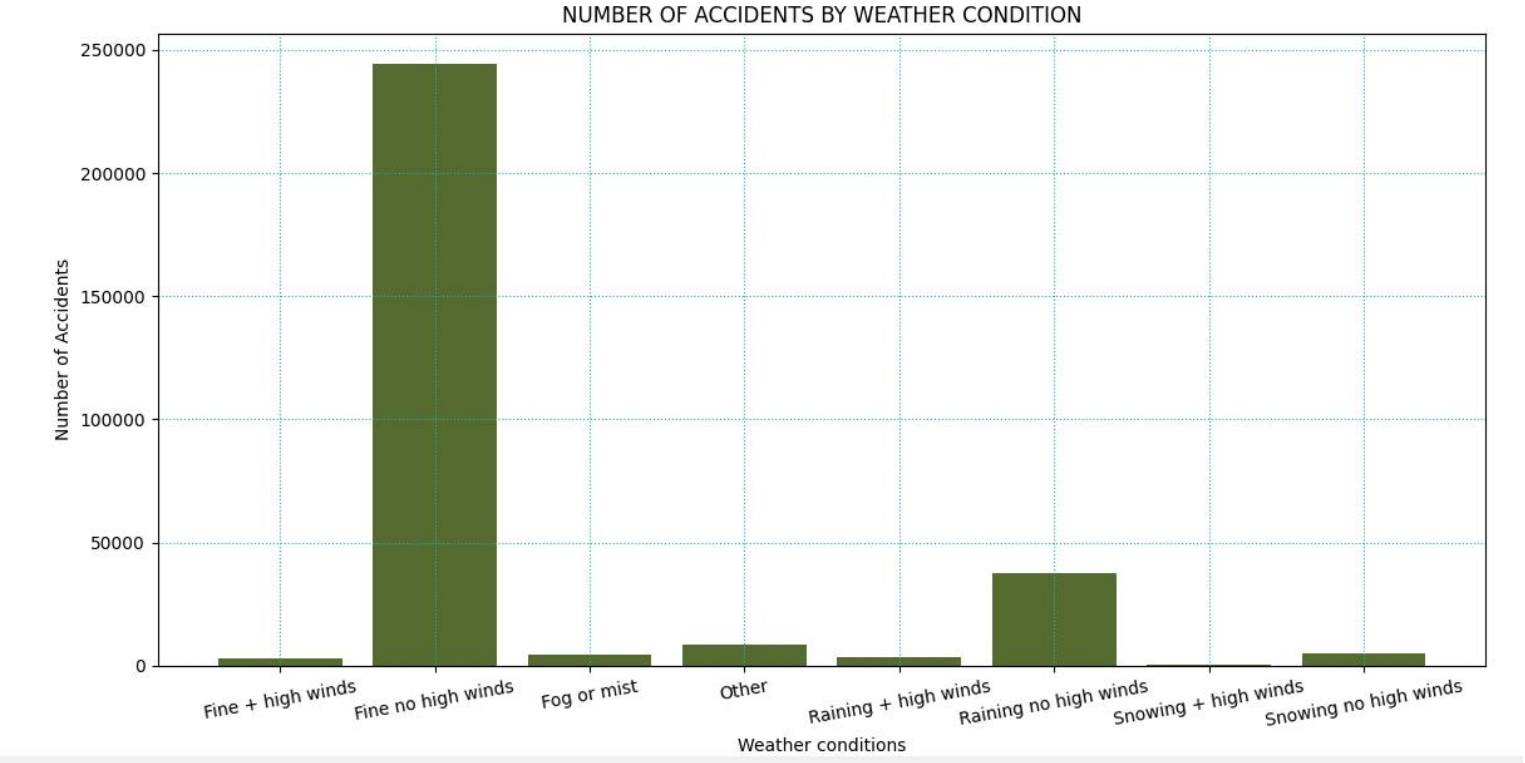
	Urban_or_Rural_Area	Num of Acci_12
0	Rural	109441
1	Urban	198532



#plot13:

```
acci_by_whether_condition = road_accidents.groupby("Weather_Conditions").size().reset_index(name = 'Num of Acci_13')
print(acci_by_whether_condition)
plt.bar(acci_by_whether_condition["Weather_Conditions"], acci_by_whether_condition['Num of Acci_13'],color = "darkolivegreen")
plt.xticks(rotation=10)
plt.title("NUMBER OF ACCIDENTS BY WEATHER CONDITION")
plt.xlabel("Weather conditions")
plt.ylabel("Number of Accidents")
plt.grid(ls = ':',color = "lightseagreen")

plt.show()
```

	Weather_Conditions	Num of Acci_13
0	Fine + high winds	3148
1	Fine no high winds	244496
2	Fog or mist	4783
3	Other	8802
4	Raining + high winds	3526
5	Raining no high winds	37841
6	Snowing + high winds	538
7	Snowing no high winds	4839



#plot14:

```
acci_by_vehical_type = road_accidents.groupby("Vehicle_Type").size()
print(acci_by_vehical_type)
acci_by_vehical_type.plot(kind = "barh", fontsize = 6, color = "lightcoral")
plt.yticks(rotation = 59)
plt.title("NUMBER OF ACCIDENTS BY VEHICAL TYPE")
plt.ylabel("Vehical Type")
plt.xlabel("Number of Accidents")
plt.grid(ls = ":", color = "lightsalmon")
plt.show()
```

```
Vehicle_Type
Agricultural vehicle                          749
Bus or coach (17 or more pass seats)         8686
Car                                        239794
Goods 7.5 tonnes mgw and over                6532
Goods over 3.5t. and under 7.5t              2502
Minibus (8 - 16 passenger seats)              821
Motorcycle 125cc and under                   6852
Motorcycle 50cc and under                    3703
Motorcycle over 125cc and up to 500cc        3285
Motorcycle over 500cc                       11226
Other vehicle                                2516
Pedal cycle                                    66
Ridden horse                                    3
Taxi/Private hire car                        5543
Van / Goods 3.5 tonnes mgw or under         15695
dtype: int64
```