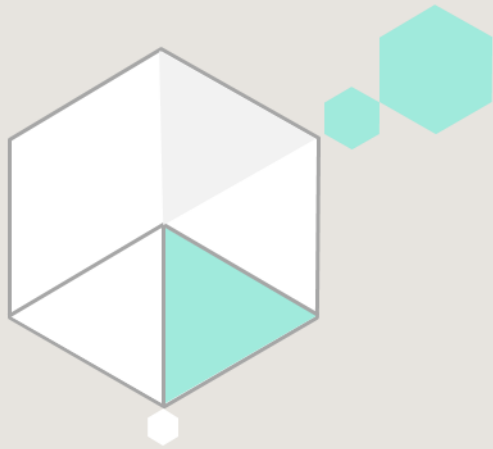


파이썬 개별 프로젝트

사고 자료 시각화하기

2018. 01. 30

김지원, 권정아



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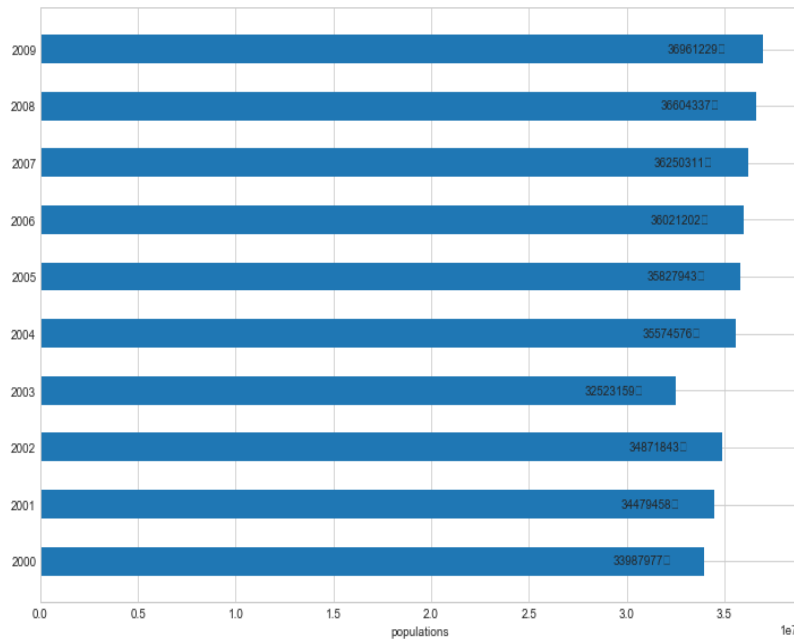


분석 개요

분석 개요

과제1 : 통계분석

- 미국의 연도별인구를 나타냄



과제2 : 워드클라우드

- 단톡방 데이터 분석



많은 양의 데이터를 한눈에 알아볼 수 있게 시각화

교통분야에 활용

- 교통사고 데이터분석
 - ▶ 도별 사고유형 빈도수
 - ▶ 도별 사고원인

분석방법

- Python을 통한 그래프 & 워드클라우드로 데이터를 시각화
 - ▶ 그래프 : 사고 유형별 빈도수를 나타내기 적합
 - ▶ 워드클라우드 : 사고원인을 한눈에 보여줌





분석 개요

분석 과정

● 데이터 수집 ➡ 데이터 정제 ➡ 데이터 분석 ➡ 분석 결과 검토

● 데이터 수집

2014년도 경찰청 사고 정보 데이터 (사고 년월, 법정동 코드, HIT 법정동 코드, 사고상황, 사고 유형 코드)
법정동 코드 데이터 (법정동 코드, 법정동명폐지여부)
코드 데이터

● 데이터 정제

사고 유형 코드 데이터 + 법정동 코드 데이터
사고 상황 데이터 + 법정동 코드 데이터



〈법정동별 groupby〉
사고 유형 코드 빈도수
사고 상황

분석 과정

- 데이터 분석

- 1) 도별 사고 유형 표출

Matplotlib, Seaborn 사용

➡ 전체 지역 별 사고 유형 빈도수 / 도별 사고유형 누적 빈도수 / 도별 상위 6개 파이 그래프

- 2) 도별 사고 상황 분석

형태소 분석기 Twitter, WordCloud 사용

➡ 대한민국, 도별 사고 상황 워드 클라우드



구현 결과

- 1) 도별 사고 유형 표출
- 2) 도별 사고 상황 분석



도별 사고 유형 표출

- 각 사고 유형별 빈도수 그래프

```
1 # 사고 정보 데이터 불러오기
2 ac_data = pd.read_excel("2014 경찰청 사고 정보 데이터.xlsx")
3 ac_data.columns=['사고년월', '법정동코드', 'HIT법정동코드', '사고상황', 'code']
4 ac_data = ac_data.drop(0)
```

```
1 # 법정동 코드 정보 불러오기
2 code1 = pd.read_excel("법정동코드.xls")
3 code1.columns=['법정동코드', '법정동', 'a', '2', '3', '4', '5']
4 del code1["a"]
5 code2=code1.dropna(how="any", axis=1)
```

```
1 # 사고 정보 데이터와 법정동 코드를 '법정동코드'로 합치기
2 result = pd.merge(ac_data, code1, on=['법정동코드'])
```

```
1 # font와 해상도 설정
2 font_location = "C:/Windows/Fonts/HMKMRAHD.TTF"
3 font_name = font_manager.FontProperties(fname=font_location).get_name()
4 rc('font', family=font_name)
5 fig=plt.figure(dpi= 500)
```

```
1 # 격자 그리기
2 sns.set(style="darkgrid")
```

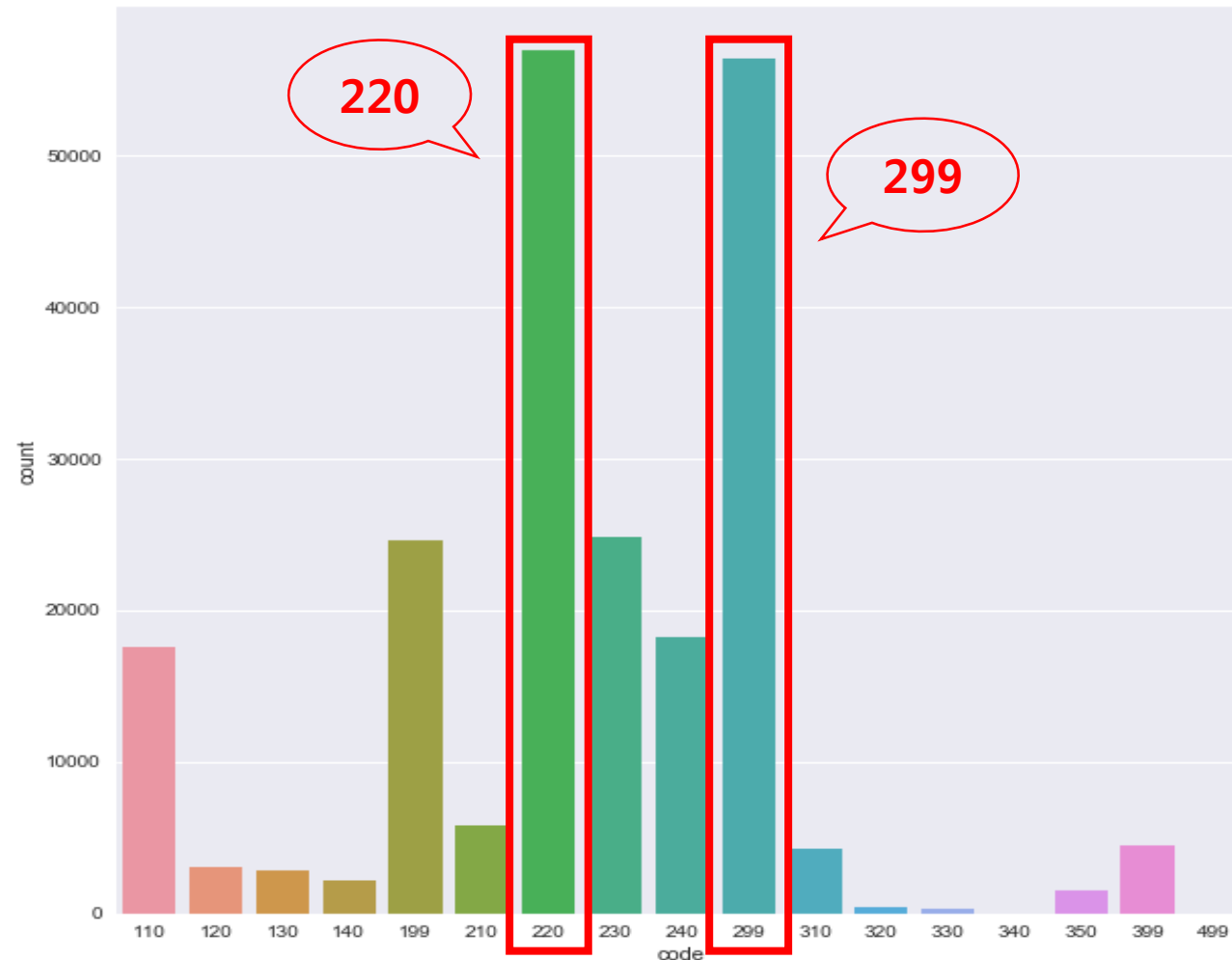
```
1 # 전체 지역에서 사고 유형별 빈도수 그래프 그리기
2 graph = sns.countplot(x="code", data = result)
3 plt.show()
```





도별 사고 유형 표출

- 220 - 측면직각충돌 & 299 - 차대차(기타)가 가장 많음



코드	사고 유형
110	횡단중
120	차도통행중
130	길가장자리구역통행중
140	보도통행중
199	차대사람 - 기타
210	정면충돌
220	측면직각충돌
230	추돌(진행중)
240	추돌(주정차중)
299	차대차-기타
310	공작물추돌
320	도로외이탈(추락)
330	도로외이탈(기타)
340	주차차량추돌
350	전도전복
399	차량단독-기타
410	차단기돌파
420	경보기무시
430	직진진행
499	철길건널목-기타



도별 사고 유형 표출

- 각 도별 사고 빈도수

```
1 # 각 도별로 사고유형코드 개수 세기
2 result2 = result1["code"].value_counts()
```

```
1 # result2 unstack
2 result4 = result2.unstack(level=0)
3 result4.head()
```

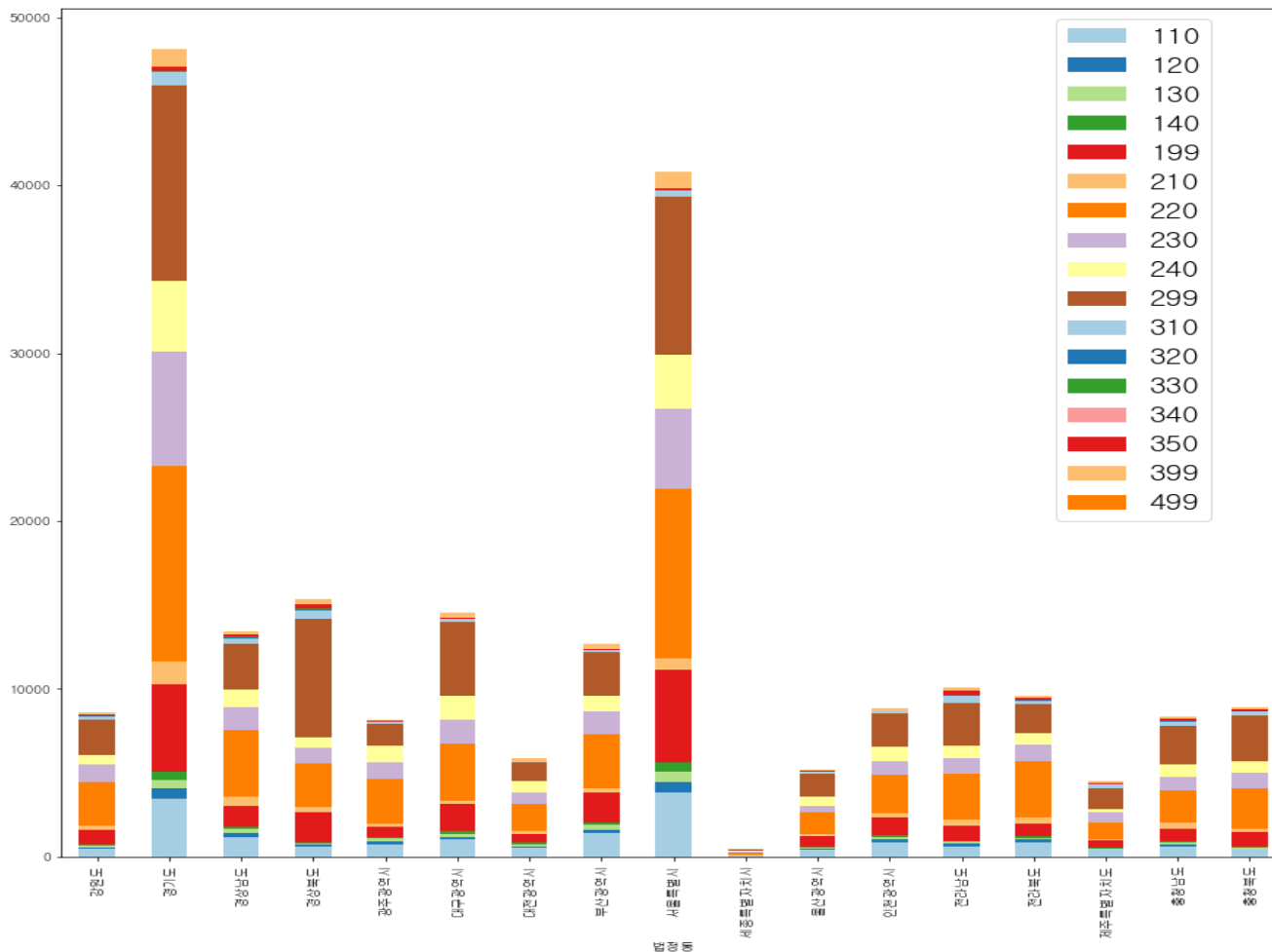
	법정 동	강원 도	경기도	경상남 도	경상북 도	광주 광역시	대구광 역시	대전 광역시	부산광 역시	서울특 별시	세종 특별 자치 시	울산 광역시	인천광 역시	전라 남도	전라 북도	제주 특별 자치 도	충청 남도	충청 북도
code																		
110	475.0	3471.0	1169.0	613.0	750.0	1010.0	539.0	1406.0	3850.0	33.0	439.0	860.0	632.0	843.0	474.0	584.0	396.0	41.0
120	86.0	608.0	266.0	104.0	176.0	153.0	96.0	218.0	606.0	3.0	57.0	171.0	153.0	169.0	19.0	126.0	41.0	4.0
130	99.0	519.0	209.0	93.0	160.0	159.0	116.0	303.0	605.0	1.0	68.0	117.0	106.0	94.0	11.0	117.0	91.0	9.0
140	71.0	445.0	122.0	49.0	91.0	186.0	106.0	133.0	549.0	3.0	33.0	111.0	47.0	128.0	13.0	60.0	4.0	4.0
199	837.0	5217.0	1262.0	1772.0	586.0	1624.0	524.0	1740.0	5508.0	39.0	602.0	1094.0	925.0	747.0	489.0	775.0	91.0	9.0

```
1 # 누적 그래프 그리기
2 kk = result4.T.plot(kind='bar', stacked=True,
3                     colormap=ListedColormap(sns.color_palette("Paired",20)),
4                     figsize=(15,15))
5 kk.legend(loc=2, prop={'size': 20}, bbox_to_anchor=(0.8, 1.0))
6
7 plt.show()
```



도별 사고 유형 표출

- 각 도별 사고 빈도수
- 경기도, 서울특별시가 사고가 가장 많음





도별 사고 유형 표출

- 각 도별 상위 6개 사고유형 파이 그래프

```
# 도별 상위 6개로 파이 그래프 그리기
for i in m_list:
    a=result2['%s' %i]
    b = pd.DataFrame(a)
    b.columns = ['빈도수']
    c = b[:6]
    c.reset_index()

    labels = c.index
    sizes = c.빈도수
    colors = ['yellowgreen', 'gold', 'lightskyblue', 'lightcoral', 'lightgreen', 'lightpink']

    sizes = c.빈도수
    explode = (0.1,0.1,0,0,0,0)

    plt.pie(sizes, labels = labels, autopct = '%1.1f%%', explode=explode, colors = colors)

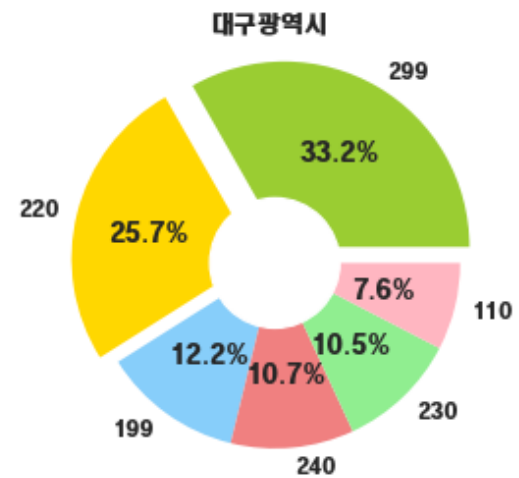
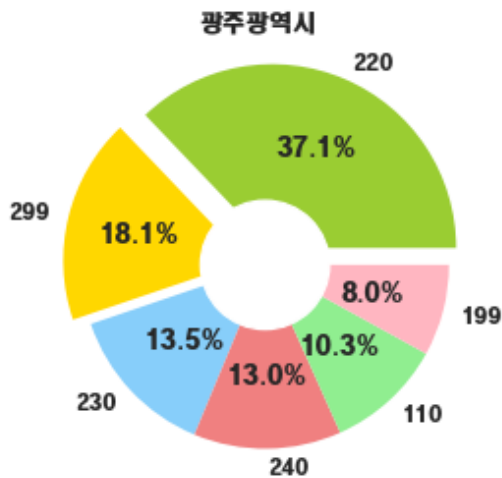
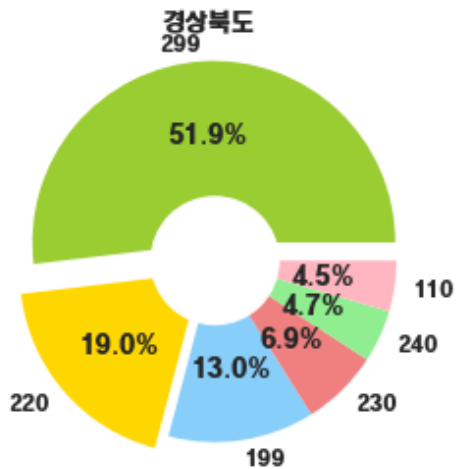
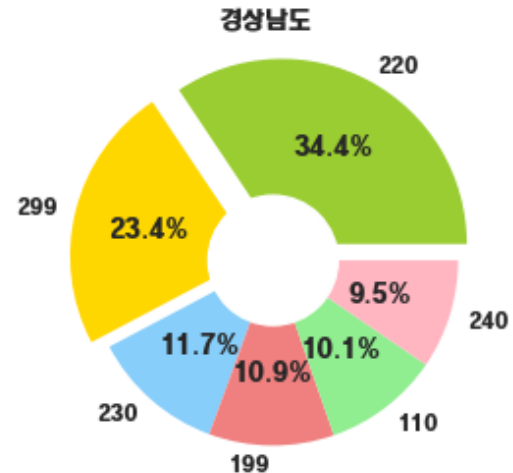
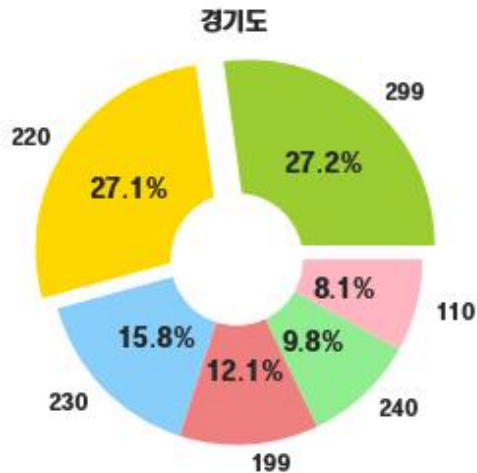
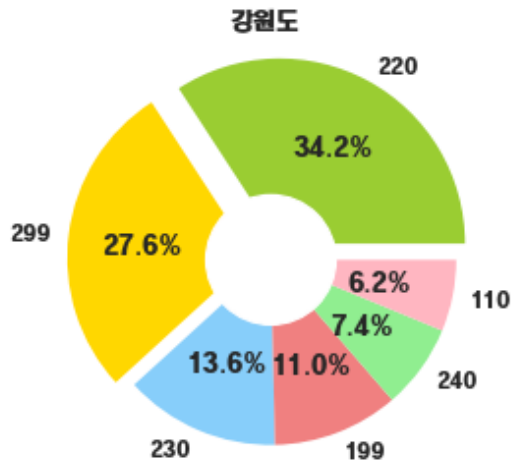
    centre_circle = plt.Circle((0,0),0.35,color='white',fc='white',linewidth=1.25 )
    fig = plt.gcf()
    fig.gca().add_artist(centre_circle)

    plt.title('%s' %i)
    plt.axis('equal')
    plt.show()
```





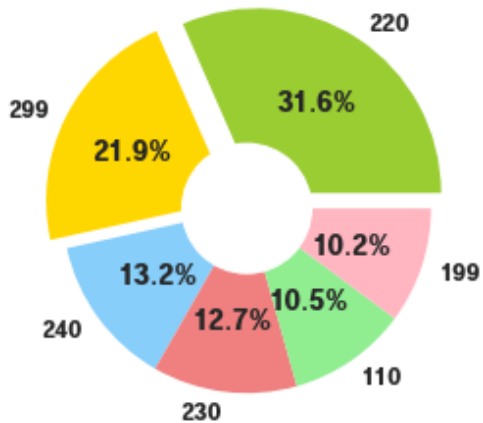
도별 사고 유형 표출



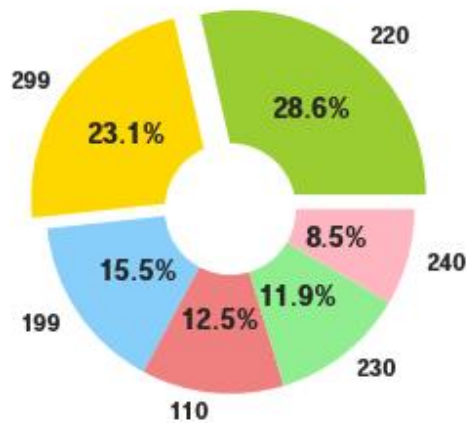


도별 사고 유형 표출

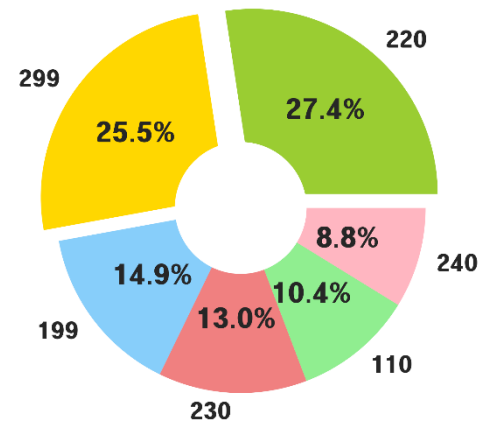
대전광역시



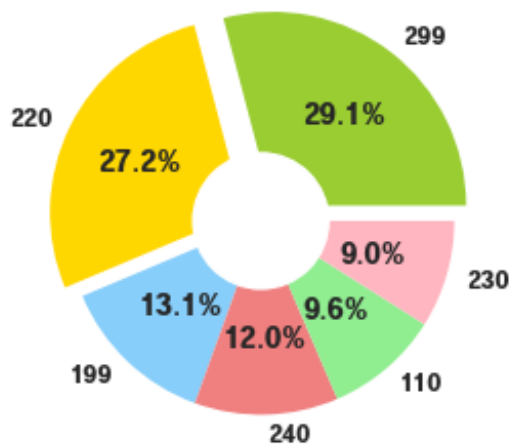
부산광역시



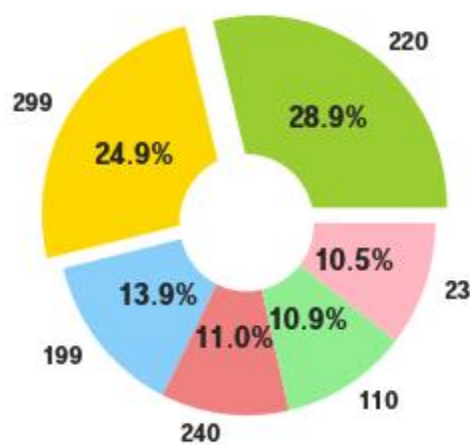
서울특별시



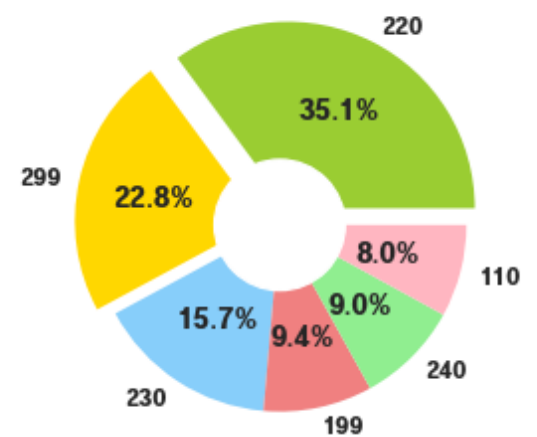
울산광역시



인천광역시

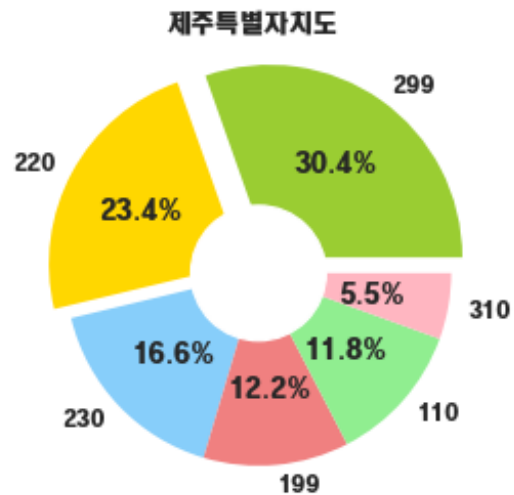
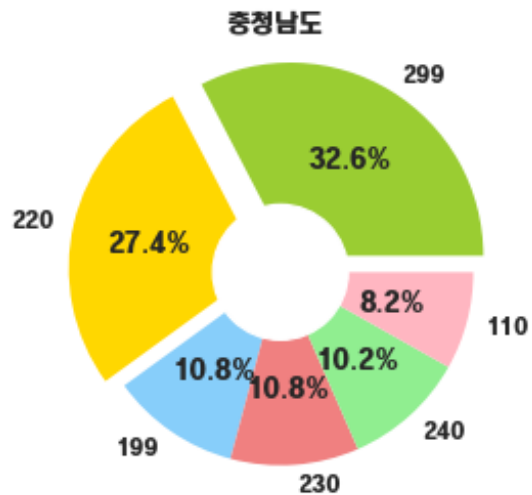
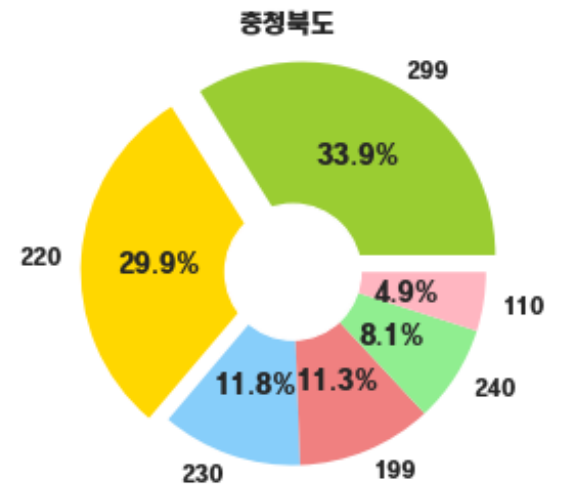
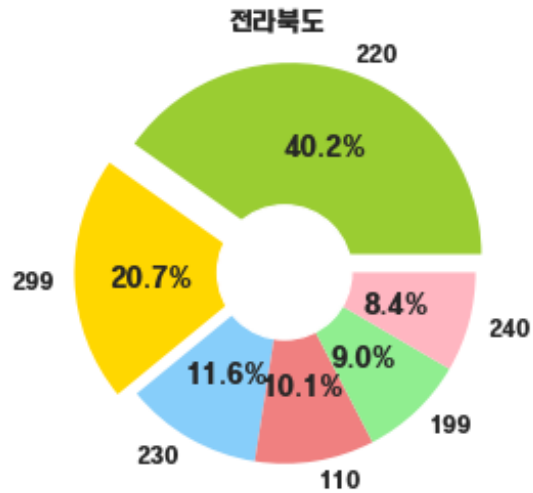
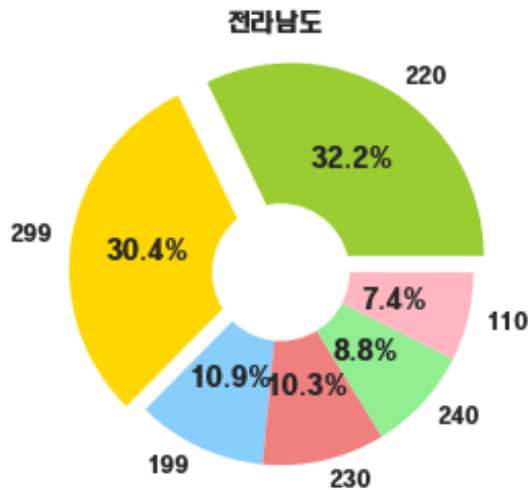


세종특별자치시





도별 사고 유형 표출





도별 사고 상황 분석

```
1 # color function 설정
2 def grey_color(word, font_size, position, orientation, random_state=None, **kwargs):
3     return 'hsl(0, 0%, %d%%)' % random.randint(50, 100)
```

```
1 # 폰트 설정
2 font_location = 'C:/Windows/Fonts/HMKMHHD.TTF'
3 font_name = font_manager.FontProperties(fname=font_location).get_name()
4 rc('font', family=font_name)
```

```
#for 문 설정 - 사고상황 데이터만 추출 후 워드클라우드 그리기
for i in m_list:
```

```
    a = result1[result1['법정동'] == '%s' % i]
    b = a['사고상황']
    c = ", ".join(str(v) for v in b)
    d = nlp.nouns(c)
    e = ", ".join(d)
    mask = np.array(Image.open("C:/python/프로젝트/마스크/%s.jpg" % i))
    wc = WordCloud(background_color="black", max_words=2000, mask=mask, stopwords = stopwords, font_path = font_location)
    wc2 = wc.generate(e)

    fig = plt.figure()
    title = ('%s' % i)
    fig.set_figwidth(14)
    fig.set_figheight(18)

    plt.imshow(wc.recolor(color_func=grey_color, random_state=3))
    plt.title(title, size=30)
    plt.axis('off')
    plt.show()
    plt.savefig("%s.png" % i)
```

[illegible]







신호음 대기

진행중 사거리 교차로 직진 진행

좌회전 우회전

변경 창원시 진해구

진로 사거리 운행 정차 피복

신호 직진 자전거 일시

바퀴 진행 직진 바퀴



도별 사고 상황 분석

경상북도

지도 범위
일련





광주광역시



[illegible]



신호 대기 변경 우회 진행 지점 점 진행중 피해자 추적 전면 부 운전자



부산광역시





서울특별시







울산광역시



[illegible]

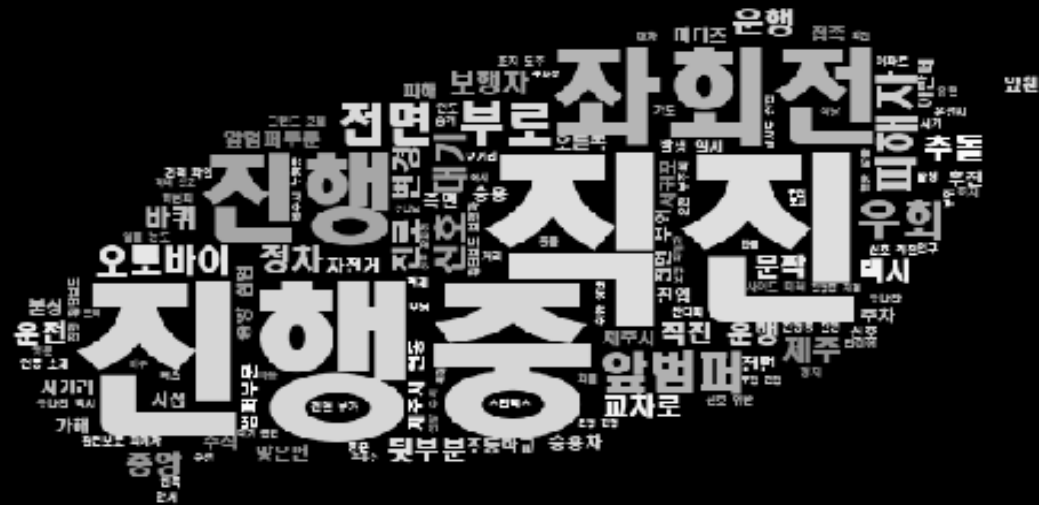
[illegible]



전라북도

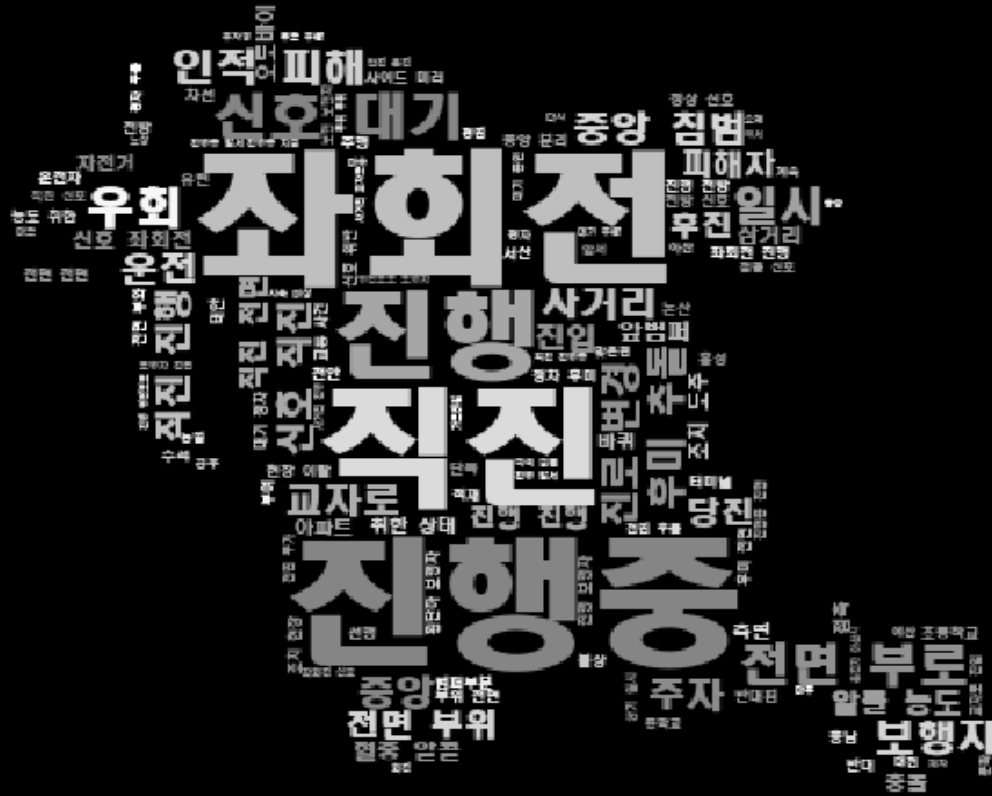


제주특별자치도





충청남도





A word cloud shaped like a car, composed of various Korean words related to driving, traffic, and safety. The largest words are "신호" (Traffic Light), "좌회전" (Left Turn), "우회전" (Right Turn), "직진" (Go Straight), "대기" (Waiting), "주행" (Driving), "변경" (Change), "일시" (Temporary), "진행중" (In Progress), "진행" (Progress), and "지점" (Location). Other visible words include "차량" (Vehicle), "도로" (Road), "안전" (Safety), "교통" (Traffic), "사고" (Accident), "위험" (Danger), "속도" (Speed), "거리" (Distance), "시간" (Time), "비용" (Cost), "환경" (Environment), "공해" (Pollution), "소음" (Noise), "배출" (Emission), "연료" (Fuel), "유류" (Oil), "보험" (Insurance), "책임" (Responsibility), "과태료" (Fine), "단속" (Enforcement), "점검" (Check), "정비" (Maintenance), "검사" (Inspection), "허가" (Permission), "등록" (Registration), "번호" (Number), "표지" (Sign), "안내" (Guide), "표識" (Marking), "시설" (Facility), "구조" (Structure), "재료" (Material), "제작" (Production), "판매" (Sales), "유통" (Distribution), "수입" (Import), "수출" (Export), "제조" (Manufacture), "개발" (Development), "연구" (Research), "시험" (Test), "평가" (Evaluation), "인증" (Certification), "표준" (Standard), "규격" (Specification), "요구사항" (Requirement), "기능" (Function), "성능" (Performance), "내구성" (Durability), "신뢰성" (Reliability), "보안" (Security), "방화" (Fireproof), "충격" (Shock), "진동" (Vibration), "노후화" (Aging), "폐기" (Disposal), "재활용" (Recycling), "친환경" (Eco-friendly), "저탄소" (Low-carbon), "에너지" (Energy), "효율" (Efficiency), "생산성" (Productivity), "경쟁력" (Competitiveness), "혁신" (Innovation), "성장" (Growth), "발전" (Development), "번영" (Prosperity), "평화" (Peace), "협력" (Cooperation), "교류" (Exchange), "문화" (Culture), "예술" (Art), "스포츠" (Sports), "관광" (Tourism), "농업" (Agriculture), "산업" (Industry), "서비스" (Service), "커뮤니티" (Community), "사회" (Society), "경제" (Economy), "정치" (Politics), "외교" (Diplomacy), "군사" (Military), "법률" (Law), "의학" (Medicine), "과학" (Science), "기술" (Technology), "정보" (Information), "통신" (Communication), "미디어" (Media), "엔터테인먼트" (Entertainment), "교육" (Education), "인문" (Humanities), "자연" (Nature), "환경" (Environment), "생물" (Biology), "화학" (Chemistry), "물리" (Physics), "공학" (Engineering), "건축" (Architecture), "디자인" (Design), "패션" (Fashion), "뷰티" (Beauty), "식품" (Food), "음식" (Food), "주류" (Alcohol), "담배" (Tobacco), "게임" (Game), "스포츠" (Sports), "여행" (Travel), "숙박" (Accommodation), "항공" (Aviation), "해운" (Shipping), "철도" (Railway), "자동차" (Automobile), "항공기" (Aircraft), "선박" (Ship), "조선" (Shipbuilding), "기계" (Mechanical), "전기" (Electrical), "전자" (Electronic), "컴퓨터" (Computer), "인터넷" (Internet), "이메일" (Email), "스마트폰" (Smartphone), "태블릿" (Tablet), "웨어러블" (Wearable), "IoT" (Internet of Things), "빅데이터" (Big Data), "클라우드" (Cloud), "블록체인" (Blockchain), "암호화폐" (Cryptocurrency), "로봇" (Robot), "드론" (Drone), "자율주행" (Autonomous Driving), "인공지능" (Artificial Intelligence), "머신러닝" (Machine Learning), "딥러닝" (Deep Learning), "강화학습" (Reinforcement Learning), "자연어처리" (Natural Language Processing), "컴퓨터그래픽스" (Computer Graphics), "영상처리" (Image Processing), "음향처리" (Audio Processing), "신호처리" (Signal Processing), "제어시스템" (Control System), "측정시스템" (Measurement System), "검증시스템" (Verification System), "테스트시스템" (Testing System), "모의실험" (Simulation), "디지털트윈" (Digital Twin), "메타버스" (Metaverse), "VR" (Virtual Reality), "AR" (Augmented Reality), "MR" (Mixed Reality), "XR" (Extended Reality), "HMD" (Head-Mounted Display), "손목밴드" (Wristband), "스마트워치" (Smartwatch), "피트니스트래커" (Fitness Tracker), "스마트홈" (Smart Home), "스마트시티" (Smart City), "스마트공장" (Smart Factory), "스마트농업" (Smart Agriculture), "스마트의료" (Smart Healthcare), "스마트교육" (Smart Education), "스마트도시" (Smart City), "스마트국립공원" (Smart National Park), "스마트문화유산" (Smart Cultural Heritage), "스마트관광" (Smart Tourism), "스마트농산물" (Smart Agricultural Products), "스마트수산물" (Smart Seafood Products), "스마트축산물" (Smart Livestock Products), "스마트식품" (Smart Food Products), "스마트주류" (Smart Alcohol Products), "스마트담배" (Smart Tobacco Products), "스마트게임" (Smart Game Products), "스마트스포츠" (Smart Sports Products), "스마트여행" (Smart Travel Products), "스마트숙박" (Smart Accommodation Products), "스마트항공" (Smart Aviation Products), "스마트해운" (Smart Shipping Products), "스마트철도" (Smart Railway Products), "스마트자동차" (Smart Automobile Products), "스마트항공기" (Smart Aircraft Products), "스마트선박" (Smart Ship Products), "스마트조선" (Smart Shipbuilding Products), "스마트기계" (Smart Mechanical Products), "스마트전기" (Smart Electrical Products), "스마트전자" 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System Products), "스마트측정시스템" (Smart Measurement System Products), "스마트검증시스템" (Smart Verification System Products), "스마트테스트시스템" (Smart Testing System Products), "스마트모의실험" (Smart Simulation Products), "스마트디지털트윈" (Smart Digital Twin Products), "스마트메타버스" (Smart Metaverse Products), "스마트VR" (Smart Virtual Reality Products), "스마트AR" (Smart Augmented Reality Products), "스마트MR" (Smart Mixed Reality Products), "스마트XR" (Smart Extended Reality Products), "스마트HMD" (Smart Head-Mounted Display Products), "스마트손목밴드" (Smart Wristband Products), "스마트스마트워치" (Smart Smartwatch Products), "스마트피트니스트래커" (Smart Fitness Tracker Products), "스마트스마트홈" (Smart Smart Home Products), "스마트스마트시티" (Smart Smart City Products), "스마트스마트공장" (Smart Smart Factory Products), "스마트스마트농업" (Smart Smart Agriculture Products), "스마트스마트의료" (Smart Smart Healthcare Products), "스마트스마트교육" (Smart Smart Education Products), "스마트스마트도시" (Smart Smart City Products), "스마트스마트국립공원" (Smart Smart National Park Products), "스마트스마트문화유산" (Smart Smart 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Products), "스마트스마트스마트검증시스템" (



결론



결론 - 도별 사고 유형 표출

결론

- 측면직각충돌과 차 대 차 사고가 가장 많음
- 경기도, 서울특별시 사고 많음
- 각 도별로 상위 6개 일정 (진행중 추돌 - 차대 사람 - 횡단 중 사고 - 주정차중사고)

프로젝트 수행 한계

- 도별 사고 빈도수 그래프에 면적 등의 요소 고려하지 않음
- 파이차트에서 상위 6개 값 이외 항목 무시
- 데이터 정제



결론 - 도별 사고 상황 분석

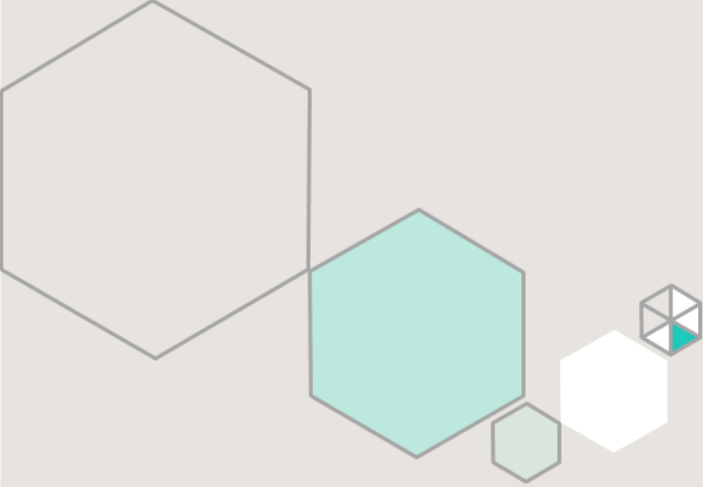
결론

- 신호대기, 진로 변경, 직진 중 등이 공통적으로 나타남

프로젝트 수행 한계

- STOPWORDS 설정 한계





Thank you

