600.315 Databases Final Project

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1) Description of application domain: Our database describes the locations of crashes involving bikes and cars in the Chapel Hill Region of North Carolina.We download the data online, and the original source is "from police-reported bicycle-motor vehicle and pedestrian-motor vehicle collisions that occurred on the public roadway network, public vehicular areas and private properties (if reported)", as stated on the website.

2) View our reseults (all steps start from the Crashes_NC folder):

- Please follow the instruction in section 6 (User's Guide) to populate the database and add stored procedures
- To view the website, first initiate apache server, and go to webpage:
    - "chmod 704 index.html"
    - "php -S 127.0.0.1:8080"
    - open Google Chrome (browser), type in the url :"http://localhost:8080/index.html"
    - now you can play with the questions we listed and try out each options in the drop down list :)
- To return to the main page (index.html), you could simply click the return button on the left top corner of the browser (for Chrome)

3.Change after phase 1

- We attach our new phase 1 at the end of the report, with the updated sql entries, database table examples, etc. But for questions that are overlapped with the questions asked here, we explain more details in here. Thus, we hope you can based mostly on this phase 2 report.
- After looking more in depth with our data sets, we decided to use the two out of three candidate datasets. Instead of including bike crashes, pedestrian crashes, and criminal records, we choose only the first two, as they both come from the same city in North Carolina, and the entries within are very similar. Therefore, we choose to analyze these two types of crashes and their factors over a more general yet too-scattered data.

4. Source of data & extraction

- We download the csv files from these online sources:https://catalog.data.gov/dataset/bicycle-crashes, https://catalog.data.gov/dataset/pedestrian-crashes and save them in the folder "raw_data".
- First, we use "Numbers" (an apple spreadsheet software that comes with mac) to change the csv files to encoding of UTF-8, and save them as "pedestrianData.csv" and "bikeCrash.csv"
- Then, we take 2 approaches to extract the data from the csvs.

- 1. We use java to extract data from the csv file for tables: PedInjParser and ReasonPed.
    - The reason we choose these two tables is because we want to add some columns to both tables, which are not originally in the csv but require some extra calculation. So we use java to pre-process the datasets.
    - We write our own Java classes for each object in the table. For example, for table pedInjure, we first write the file PedInjure.java which is the object class, and the variables within are the columns in the table. Then we use PedInjParser.java to read in the csv, parse the table, store the variables we care into the PedInjure object, and finally write the corresponding sql statement to create the table PedInjure as well as populating the table.
- 2. Considering the size and amounts of our tables, we use the online csv converter for the rest of datasets, the link to the webpage is http://www.convertcsv.com/csv-to-sql.htm.

5. Software & hardware

- We use the MySQL dbase on our JHU ugrad machine.

6. User's guide

- Step 1, for our data pre-processing part, please follow the instructions below:
    - "cd dataProcess"
    - "javac *.java", then run "java PedInjParser" and "java ReasonPedParser" to construct "pedInjure.sql and " reasonPed.sql"
    - pipe in the two sql files to the database with
        - "mysql -h dbase.cs.jhu.edu -u ycao29 -D cs41518_ycao29_db -p -t -f -vvv < ./pedInjure.sql"
        - "mysql -h dbase.cs.jhu.edu -u ycao29 -D cs41518_ycao29_db -p -t -f -vvv < ./reasonPed.sql"
        - Note: the password is "wyxjaycqli"
    - Now the two tables PedInjure and ReasonPed are stored in our database.
- Step 2, in order to populate the rest of the dataset, please follow the instructions below:
    - "cd sql"
    - fill our database by inserting all the entries with
        - "mysql -h dbase.cs.jhu.edu -u ycao29 -D cs41518_ycao29_db -p -t -f -vvv < ./BikeCrash.sql"
        - "mysql -h dbase.cs.jhu.edu -u ycao29 -D cs41518_ycao29_db -p -t -f -vvv < ./PedestrianCrash.sql"
    - split the datasets into smaller tables that we'll make operations on:
        - "mysql -h dbase.cs.jhu.edu -u ycao29 -D cs41518_ycao29_db -p -t -f -vvv < ./CleanTableProcedures.sql"
    - load in the 15 procedures we write:
        - "mysql -h dbase.cs.jhu.edu -u ycao29 -D cs41518_ycao29_db -p -t -f -vvv < ./Procedures.sql"
- Step 3, initiate apache server, and go to webpage:
    - "chmod 704 index.html"
    - "php -S 127.0.0.1:8080"

    - open Google Chrome (browser), type in the url :“http://localhost:8080/index.html”
    - now you can play with the questions we listed and try out each options in the drop down list :)
- Note: to return to the main page (index.html), you could simply click the return button on the left top corner of the browser (for Chrome)

7. Major/minor areas of specialization
- Preprocessing of data
    - We downloaded original data in CSV format. For BikeCrash data, we populated our database table BikeCrash by converting CSV data to SQL file through online conversion website http://www.convertcsv.com/csv-to-sql.htm
    - For PedestrianCrash data, we applied knowledge in object-oriented design to parse the original CSV data. We create objects for each table, and use the dot operation (as explained in class) to access the variables.
    - We also manually created primary key for our big tables before dividing them into smaller ones, using the *AUTO_INCREMENT* SQL statement.
    - We then wrote stored procedures (see CleanTableProcedures.sql) such as *DivideBikeCrashTable()* to divide a huge table into smaller ones with related attributes. Before division, we also checked all attributes related to our future queries carefully, deleting and combining columns if necessary (see CombineColumns() in CleanTableProcedures.sql)
- Complex stored procedures
    - Although we have only 15 queries, each query usually requires 2-3 mysql queries, where one retrieves information from PedestrianCrash data, one retrieves information from BikeCrash data, and another one returns a table that acts like a legend should information be too complex for users to interpret.
    - Additionally, we attempted to analyze and retrieve complex information. For example, for some queries, we have to display the most frequent value for multiple attributes during the user-specified time (from and to) in one single table. We also attempted and succeeded in displaying two lists, one displaying pedestrian crash types and one displaying bike crash types, as two columns in one table.
- MySQLi Language
    - At first, when we use MySQL database system with our php files, we had trouble displaying multiple, separate tables in one php. After doing some research, we learned that MySQLi extension supports multiple statements (and prepared statements, etc.), so we quickly switched to MySQLi and successfully displayed as many tables as we would like in one php.

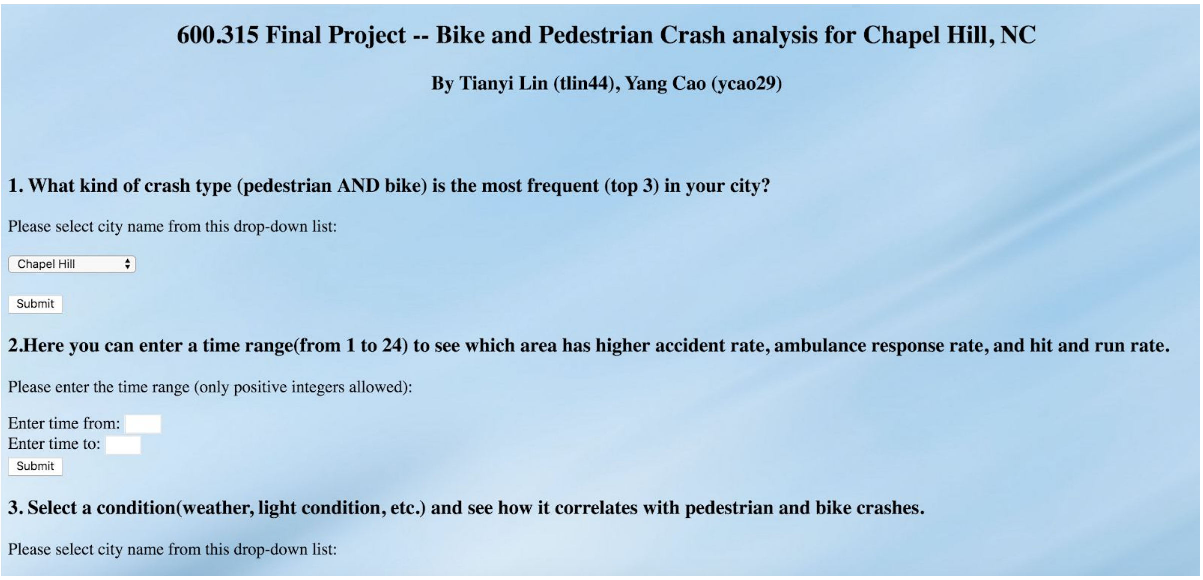
8. Strengths
- Combined queries. When we wrote our queries, we realized that some queries require the same type of user input, such as time range and age range, so we combined queries with the same type of user input together so that the user only has to enter the input once and get all corresponding query results together.
- Complex stored procedures. As mentioned in part (7), we wrote many procedures that, although only return a few lines, require complex sql manipulations.

- Check valid input using html. For hw3, we do check on php and sql side, but this time, as we do some more research on html, we use different forms and constraints on them to check whether the input is valid.
- Provide several related factors for each question. For instance, in question 3 (Select a condition(weather, light condition, etc.) and see how it correlates with pedestrian and bike crashes), we not only present the data related to user's input, but also give the most frequent type of other factors. If the user choose "road surface", we also shows the "most frequent victim severity" and "Most Frequent Weather" for each type of road surface.

9. Limitations
- More polished user interface. We only had time to use the most basic html language that displays a very simple interface for users to interact with.
- Graph analysis. Since both our pedestrian and bike crash data contain time information, we could draw and display graphs that shows patterns of how time correlates with certain attributes.
- Server. Now our project can only run on ugrad server. If we had more time, we might be able to setup a public server through Heroku.

10. Everything was done on our own and NOT for any other project/course/research.

11.
- Our main html page:



- The user can choose which factor they want to see, and the factor's correlation with our dataset. As for the output, we not only present the road surface type and their number of crashes & rate, but also the most frequent severity and the most frequent weather. This intuitively makes sense, since a user might be curious about under what weather does each surface condition causes crash the most, or what's the most probable injure one will get when being hit on a certain type of road.

3. Select a condition(weather, light condition, etc.) and see how it correlates with pedestrian and bike crashes.

Please select city name from this drop-down list:

- light condition
- ✓ road surface
- weather
- exceed speed limit
- detected alcohol in driver

Pedestrian crashes:

Surface Condition	Count	Percentage	Most Frequent Severity	Most Frequent Weather
Smooth Asphalt	222	69.3750	B: Evident Injury	Clear
Coarse Asphalt	81	25.3125	B: Evident Injury	Clear
Concrete	11	3.4375	B: Evident Injury	Clear
Gravel	5	1.5625	B: Evident Injury	Clear
Unknown	1	0.3125	B: Evident Injury	Clear

Bike crashes:

Surface Condition	Count	Percentage	Most Frequent Severity	Most Frequent Weather
Smooth Asphalt	131	79.3939	B: Evident Injury	Clear
Coarse Asphalt	29	17.5758	B: Evident Injury	Clear
Concrete	3	1.8182	B: Evident Injury	Clear
Other	1	0.6061	B: Evident Injury	Clear
Gravel	1	0.6061	B: Evident Injury	Clear

- Here, we display the age group and the pedestrian position, injury type, etc. for each victim in the database.

Note1: Since the entries within each age group is very limited, we present the entire dataset below.

Note2: If the table is empty, it means there are no crashes within this age group.
Info about pedestrian crash victims:

Count	Age Group	Pedestrian Position	Pedestrian Race	Pedestrian Injury	Pedestrian Sex
11	6-10	Non-Roadway - Parking Lot / Other	White	B: Evident Injury	Female
11	6-10	Non-Roadway - Parking Lot / Other	Hispanic	C: Possible Injury	Male
11	6-10	Driveway / Alley	Asian	C: Possible Injury	Female
11	6-10	Non-Roadway - Parking Lot / Other	Black	C: Possible Injury	Male
11	6-10	Crosswalk Area	White	C: Possible Injury	Male
11	6-10	Travel Lane	Black	B: Evident Injury	Female
11	6-10	Non-Roadway - Parking Lot / Other	Black	C: Possible Injury	Female
11	6-10	Travel Lane	White	A: Disabling Injury	Male
11	6-10	Non-Roadway - Parking Lot / Other	White	O: No Injury	Female
11	6-10	Non-Roadway - Parking Lot / Other	Hispanic	C: Possible Injury	Female
11	6-10	Crosswalk Area	Black	B: Evident Injury	Male

Info about bike crash victims:

Count	Age Group	Biker Position	Biker Race	Biker Injury	Biker Sex	Biker Drink Alcohol
6	6-10	Travel Lane	Black	B: Evident Injury	Male	No
6	6-10	Driveway / Alley	White	C: Possible Injury	Male	No
6	6-10	Driveway / Alley	White	B: Evident Injury	Male	No
6	6-10	Sidewalk / Crosswalk / Driveway Crossing	White	C: Possible Injury	Male	No
6	6-10	Travel Lane	Black	B: Evident Injury	Male	No
6	6-10	Sidewalk / Crosswalk / Driveway Crossing	Black	B: Evident Injury	Female	No

- For question 5 (Display analysis on both bike and pedestrian crash related to the severity of injury, frequency of crashes at intersection/non-intersection and traffic control), we combine several stored procedure in the output of this one question. And we label the parts with corresponding potential questions. In addition, we list out all injury types for user's reference, since we only show the highest crash severity type for pedestrian and bike, it'll be better for user to understand the condition better when knowing the whole criteria.

-

Part 1: which type of crash (pedestrian or bike) has higher severity of injury?
Pedestrian crash:

Crash Severity Level	Percentage
B: Evident Injury	40.6250
C: Possible Injury	40.6250

Bike crash:

Crash Severity Level	Percentage
B: Evident Injury	51.5152

A list of all injury types:

Crash Severity Level
A: Disabling Injury
B: Evident Injury
C: Possible Injury
K: Killed
O: No Injury

Part 2: for both pedestrian and bike crashes, do crashes happen more often at intersection/non-intersection?

Crash Location	Percentage	Most Frequent Weather	Most Frequent Light Condition
Intersection	36.2887	Clear	Daylight
Non-Intersection	36.0825	Clear	Daylight
Non-Roadway	19.3814	Clear	Daylight

- For the last problem, we present the driver information. We show the category of driver on the left, and the counts on the right. Thus, the user can easily compare the number within each category (ex. sex, race, etc.)

To give the idea of distribution of driver's sex, race, age, etc. we display the count of each category below:

Category	Count For Each Category
Female	125
Male	148
Unknown	47
Asian	15
Black	58
Hispanic	20
Native American	1
Other	6
Unknown/Missing	47
White	173
0-19	25
20-24	37
25-29	28
30-39	52
40-49	43
50-59	35
60-69	24
70+	27
Unknown	49
Assault with Vehicle	2

12.
1)

```
CREATE TABLE BikeCrashTime (
	BikeCrashID	INT NOT NULL,
	crash_time	VARCHAR(5) NOT NULL,
	crash_hour	DECIMAL(4,1) NOT NULL,
	crashday	VARCHAR(9) NOT NULL,
	crash_mont	VARCHAR(9) NOT NULL,
	crash_year	INT(11) NOT NULL,
	PRIMARY KEY (BikeCrashID)
);
# INSERT INTO
BikeCrashTime(BikeCrashID,crash_time,crash_hour,crashday,crash_mont,crash_year) VALUES (1, “10:12”, 10.0, “Saturday”, “July”, 2011);
```

BikeCrashID	crash_time	crash_hour	crashday	crash_mont	crash_year
1	“10:12”	10.0	“Saturday”	“July”	2011

2)

```
CREATE TABLE BikeCrashLoc (
	BikeCrashID	INT NOT NULL,
	lat		DECIMAL(12,10) NOT NULL,
	lon		DECIMAL(12,10) NOT NULL,
	county		VARCHAR(7) NOT NULL,
	city		VARCHAR(18) NOT NULL,
	rural_urba	VARCHAR(5) NOT NULL,
	crash_loc	VARCHAR(20) NOT NULL,
	developmen	VARCHAR(22) NOT NULL,
	PRIMARY KEY (BikeCrashID)
);
# INSERT INTO BikeCrashLoc(BikeCrashID,lat,lon,county,city,rural_urba,crash_loc,developmen) VALUES (1, 35.9100670923, -79.0745027481, “Orange”, “Carrboro”, “Urban”, “Non-Intersection”, “Commercial”);
```

BikeCrashID	lat	lon	county	city	rural_urba	crash_loc	developmen
1	35.9100670923	-79.0745027481	“Orange”	“Carrboro”	“Urban”	“Non-Intersection”	“Commercial”

3)

```
CREATE TABLE BikeCrashRdCond (
	BikeCrashID	INT NOT NULL,
	rd_defects	VARCHAR(7) NOT NULL,
	rd_feature	VARCHAR(23) NOT NULL,
	rd_charact	VARCHAR(20) NOT NULL,
	rd_surface	VARCHAR(14) NOT NULL,
	rd_conditi	VARCHAR(24) NOT NULL,
	speed_limi	VARCHAR(12) NOT NULL,
	traff_cntr	VARCHAR(35) NOT NULL,
	weather	VARCHAR(6) NOT NULL,
	rd_config	VARCHAR(41) NOT NULL,
	num_lanes	VARCHAR(15) NOT NULL,
	developmen	VARCHAR(22) NOT NULL,
	light_cond	VARCHAR(26) NOT NULL,
	PRIMARY KEY (BikeCrashID)
);
# INSERT INTO BikeCrashRdCond
(BikeCrashID,rd_defects,rd_feature,rd_charact,rd_surface,rd_conditi,speed_limi,traff_cntr,weather,rd_config,num_lanes,developmen,light_cond) VALUES (1, “None”, “No Special Feature”, “Straight - Level”, “Smooth Asphalt”, “Dry”, “20 - 25 MPH”, “No Control Present”, “Clear”, “Two-Way, Not Divided”, “Unknown”, “Commercial”, “Daylight”);
```

<u>BikeCrashID</u>	rd_defects	rd_feature	rd_charact	rd_surface	rd_conditi	speed_limi	traff_cntr	weather	rd_config	num_lanes	developmen	light_cond
1	“Non”e	“No Special Feature”	“Straight - Level”	“Smooth Asphalt”	“Dry”	“20 - 25 MPH”	“No Control Present”	“Clear”	“Two-Way, Not Divided”	“Unknown”	“Commercial”	“Daylight”

4)

```
CREATE TABLE BikeCrashResult (
	BikeCrashID	INT NOT NULL,
	ambulancer	VARCHAR(3) NOT NULL,
	crash_type	VARCHAR(62) NOT NULL,
	crsh_sevri	VARCHAR(19) NOT NULL,
	hit_run	VARCHAR(3) NOT NULL,
	bike_injur	VARCHAR(19) NOT NULL,
	drvr_injur	VARCHAR(18) NOT NULL,
	PRIMARY KEY (BikeCrashID)
);
```

INSERT INTO BikeCrashResult (BikeCrashID,ambulancer,crash_type,crsh_sevri,hit_run,bike_injur,drvr_injur) VALUES (1, “Yes”, “Motorist Overtaking - Bicyclist Swerved”, “K: Killed”, “No”, “K: Killed”, “O: No Injury”);

BikeCrashID	ambulancer	crash_type	crsh_sevri	hit_run	bike_injur	drvr_injur
1	“Yes”	“Motorist Overtaking - Bicyclist Swerved”	“K: Killed”	“No”	“K: Killed”	“O: No Injury”

5)
```
CREATE TABLE Biker (
        BikeCrashID     INT NOT NULL,
        bike_injur      VARCHAR(19) NOT NULL,
        bike_race       VARCHAR(15) NOT NULL,
        bike_dir        VARCHAR(14) NOT NULL,
        bike_age        VARCHAR(7) NOT NULL,
        bikeage_gr      VARCHAR(7) NOT NULL,
        bike_sex        VARCHAR(7) NOT NULL,
        bike_pos        VARCHAR(40) NOT NULL,
        bike_alc_d      VARCHAR(7) NOT NULL,
        PRIMARY KEY (BikeCrashID)
);
```
INSERT INTO Biker (BikeCrashID,bike_injur,bike_race,bike_dir,bike_age,bikeage_gr,bike_sex,bike_pos,bike_alc_d) VALUES (1, “K: Killed”, “White”, “With Traffic”, “70+”, “70+”, “Male”, “Travel Lane”, “No”);

BikeCrashID	bike_injur	bike_race	bike_dir	bikeage_gr	bike_age	bike_sex	bike_pos	bike_alc_d
1	“K: Killed”	“White”	“With Traffic”	“70+”	“70+”	“Male”	“Travel Lane”	“No”

6)
```
CREATE TABLE Driver_BikeCrash(
        BikeCrashID     INT NOT NULL,
        drvr_vehty      VARCHAR(34) NOT NULL,
        drvr_injur      VARCHAR(18) NOT NULL,
        drvr_sex        VARCHAR(7) NOT NULL,
        drvr_race       VARCHAR(15) NOT NULL,
```

```
	drvr_age	VARCHAR(7) NOT NULL,
	drvrage_gr	VARCHAR(7) NOT NULL,
	drvr_estsp	VARCHAR(9) NOT NULL,
	drvr_alc_d	VARCHAR(7) NOT NULL,
	PRIMARY KEY (BikeCrashID)
);
# INSERT INTO Driver_BikeCrash
(BikeCrashID,drvr_vehty,drvr_injur,drvr_sex,drvr_race,drvr_age,drvrage_gr,drvr_estsp,drvr_alc_d)
VALUES (1, “Passenger Car”, “O: No Injury”, “Male”, “White”, “70+”, “70+”, “11 - 15 mph”,
“No”);
```

<u>BikeCrashID</u>	drvr_vehty	drvr_injur	drvr_sex	drvr_race	drvr_age	drvrage_gr	drvr_estsp	drvr_alc_d
1	“Passenger Car”	“O: No Injury”	“Male”	“White”	“70+”	“70+”	“11 - 15 mph”	“No”

7)

```
CREATE TABLE BikeCrashReason(
	BikeCrashID	INT NOT NULL,
	crashalcoh	VARCHAR(3) NOT NULL,
	excsspdind	VARCHAR(3) NOT NULL,
	drvr_alc_d	VARCHAR(7) NOT NULL,
	bike_alc_d	VARCHAR(7) NOT NULL,
	bike_pos	VARCHAR(40) NOT NULL,
	bike_dir	VARCHAR(14) NOT NULL,
	drvr_estsp	VARCHAR(9) NOT NULL,
	on_rd		VARCHAR(23),
	PRIMARY KEY (BikeCrashID)
);
# INSERT INTO BikeCrashReason
(BikeCrashID,crashalcoh,excsspdind,drvr_alc_d,bike_alc_d,bike_pos,bike_dir,drvr_estsp,on_rd)
VALUES (1, “No”, “No”, “No”, “No”, “Travel Lane”, “With Traffic”, “11 - 15 mph”, NULL);
```

BikeCrashReason

<u>BikeCrashID</u>	crashalcoh	excsspdind	drvr_alc_d	bike_alc_d	bike_pos	bike_dir	drvr_estsp	on_rd
1	“No”	“No”	“No”	“No”	“Travel Lane”	“With Traffic”	“11 - 15 mph”	NULL

8)

```
CREATE TABLE PedCrashRdCond (
	BikeCrashID	INT NOT NULL,
```

rd_defects	VARCHAR(22) NOT NULL,
rural_urba	VARCHAR(5) NOT NULL,
city	VARCHAR(18) NOT NULL,
locality	VARCHAR(28) NOT NULL,
rd_feature	VARCHAR(32) NOT NULL,
light_cond	VARCHAR(26) NOT NULL,
rd_charact	VARCHAR(20) NOT NULL,
rd_surface	VARCHAR(14) NOT NULL,
developmen	VARCHAR(22) NOT NULL,
traff_cntr	VARCHAR(35) NOT NULL,
rd_conditi	VARCHAR(7) NOT NULL,

```
        region          VARCHAR(8) NOT NULL,
        rd_class        VARCHAR(22) NOT NULL,
        weather         VARCHAR(40) NOT NULL,
        num_lanes       VARCHAR(15) NOT NULL,
        rd_config       VARCHAR(41) NOT NULL,
        PRIMARY KEY (BikeCrashID)
);
# INSERT INTO PedCrashRdCond (BikeCrashID,rd_defects,rural_urba,city,locality,rd_feature,light_cond,rd_charact,rd_surface,developmen,traff_cntr,rd_conditi,region,rd_class,weather,num_lanes,rd_config) VALUES (1, “None”, “Urban”, “Chapel Hill”, “Urban (>70% Developed)”, “No Special Feature”, “Dark - Roadway Not Lighted”, “Straight - Level”, “Smooth Asphalt”, “Commercial”, “No Control Present”, “Dry”, “Piedmont”, “Public Vehicular Area”, “Clear”, “Unknown”, “Unknown”);
```

PedCrashID	rd_defects	rural_urba	city	locality	rd_feature	light_cond	rd_charact
1	“None”	“Urban”	“Chapel Hill”	“Urban (>70% Developed)”	“No Special Feature”	“Dark - Roadway Not Lighted”	“Straight - Level”

rd_surface	developmen	traff_cntr	rd_conditi	region	rd_class	weather	num_lanes	rd_config
“Smooth Asphalt”	“Commercial”	“No Control Present”	“Dry”	“Piedmont”	“Public Vehicular Area”	“Clear”	“Unknown”	“Unknown”

9)

```
CREATE TABLE DiverBiker_PedCrash (
        BikeCrashID     INT NOT NULL,
        drvr_age        VARCHAR(7) NOT NULL,
        drvrage_gr      VARCHAR(7) NOT NULL,
        drvr_estsp      VARCHAR(9) NOT NULL,
        speed_limi      VARCHAR(12) NOT NULL,
        drvr_vehty      VARCHAR(36) NOT NULL,
        drvr_injur      VARCHAR(19) NOT NULL,
        drvr_sex        VARCHAR(7) NOT NULL,
        drvr_race       VARCHAR(15) NOT NULL,
        drvr_alc_d      VARCHAR(7) NOT NULL,
        PRIMARY KEY (BikeCrashID)
);
```

INSERT INTO DiverBiker_PedCrash (BikeCrashID,drvr_age,drvrage_gr,drvr_estsp,speed_limi,drvr_vehty,drvr_injur,drvr_sex,drvr_race,drvr_alc_d) VALUES (2, “46”, “40-49”, “Unknown”, “30 - 35 MPH”, “Passenger Car”, “O: No Injury”, “Female”, “White”, “No”);

BikeCrashID	drvr_age	drvrage_gr	drvr_estsp	speed_limi	drvr_vehty	drvr_injurdrvr_sex	drvr_alc_d	drvrage_gr	drvr_estsp
1	“46”	“40-49”	“Unknown”	“30 - 35 MPH”	“Passenger Car”	“O: No Injury”	“Female”	“White”	“No”

10)

```
CREATE TABLE PedCrashDetail(
	BikeCrashID	INT NOT NULL,
	crsh_sevri	VARCHAR(19),
	ambulancer	VARCHAR(3) NOT NULL,
	crash_time	VARCHAR(5) NOT NULL,
	crash_year	INT(11) NOT NULL,
	county		VARCHAR(7) NOT NULL,
	longitude	DECIMAL(5,1) NOT NULL,
	latitude	DECIMAL(4,1) NOT NULL,
	crash_mont	VARCHAR(9) NOT NULL,
	crash_type	VARCHAR(50) NOT NULL,
	city		VARCHAR(18) NOT NULL,
	locality	VARCHAR(28) NOT NULL,
	ped_pos		VARCHAR(46) NOT NULL,
	drvr_injur	VARCHAR(19) NOT NULL,
	crashday	VARCHAR(9) NOT NULL,
	crash_loc	VARCHAR(20) NOT NULL,
	crash_hour	DECIMAL(4,1) NOT NULL,
	geo_shape	VARCHAR(74) NOT NULL,
	crash_date	DATE NOT NULL,
	crash_grp	VARCHAR(45) NOT NULL,
	hit_run		VARCHAR(3) NOT NULL,
	PRIMARY KEY (BikeCrashID)
);
```

INSERT INTO PedCrashDetail (BikeCrashID,crsh_sevri,ambulancer,crash_time,crash_year,county,longitude,latitude,crash_mont,crash_type,city,locality,ped_pos,drvr_injur,crashday,crash_loc,crash_hour,geo_shape,crash_date,crash_grp,hit_run) VALUES (1, “B: Evident Injury”, “Yes”, “1:52”, 2007, “Orange”, -79.0, 36.0,

“November”, “Assault with Vehicle”, “Chapel Hill”, “Urban (>70% Developed)”, “Non-Roadway - Parking Lot / Other”, “Unknown Injury”, “Saturday”, “Non-Roadway”, 1.0, {"type": "Point", "coordinates": [-79.02140273340797, 35.93761709952935]}, 0000-00-00, “Unusual Circumstances”, “No”);

<u>PedCrashID</u>	crsh_sevri	ambulancer	crash_time	crash_year	county	longitude	latitude	crash_mont	crash_type
1	“B: Evident Injury”	“Yes”	“1:52”	2007	“Orange”	-79.0	36.0	“November”	“Assault with Vehicle

city	locality	ped_pos	drvr_injur	crash day	crash_loc	crash_hour	geo_shape	crash_date	crash_grp	hit_run
“Chapel Hill”	“Urban (>70% Developed)”	“Non-Roadway - Parking Lot / Other”	“Unknown Injury”	“Saturday”	“Non-Roadway”	1.0	{"type": "Point", "coordinates": [-79.021402733340797, 35.93761709952935]}	0000-00-00	“Unusual Circumstances”	“No”

11)
```
CREATE TABLE PedInjure (
	BikeCrashID	INT NOT NULL,
	ped_pos		VARCHAR(46) NOT NULL,
	ped_race	VARCHAR(15) NOT NULL,
	pedage_grp	VARCHAR(7) NOT NULL,
	ped_age		VARCHAR(7) NOT NULL,
	ped_injury	VARCHAR(19) NOT NULL,
	ped_sex		VARCHAR(7) NOT NULL,
	PRIMARY KEY (BikeCrashID)
```

);
INSERT INTO PedInjure
(BikeCrashID,ped_pos,ped_race,pedage_grp,ped_age,ped_injury,ped_sex) VALUES (1, "Non-Roadway - Parking Lot / Other", "Black", "25-29", "29", "B: Evident Injury", "Male");

<u>PedCrashID</u>	ped_pos	ped_race	pedage_grp	ped_age	ped_injury	ped_sex
1	"Non-Roadway - Parking Lot / Other"	"Black"	"25-29"	"29"	"B: Evident Injury"	"Male"

12)

```
CREATE TABLE ReasonPed(
	BikeCrashID	INT NOT NULL,
	crashalcoh	VARCHAR(60) NOT NULL,
	excsspdind	VARCHAR(30) NOT NULL,
	ped_pos		VARCHAR(60) NOT NULL,
	drvr_injur	VARCHAR(30) NOT NULL,
	hit_run		VARCHAR(5) NOT NULL,
	drvr_estsp	VARCHAR(30) NOT NULL,
	exceedSpeed	VARCHAR(30) NOT NULL,
	speed_limi	INT(11) NOT NULL,
	PRIMARY KEY (BikeCrashID)
);
```

INSERT INTO ReasonPed
(BikeCrashID,crashalcoh,excsspdind,ped_pos,drvr_injur,hit_run,drvr_estsp,exceedSpeed,speed_limi) VALUES (1, "No", "No", "Non-Roadway - Parking Lot", "Unknown Injury", "No", "Unknown", -1, 5);

<u>BikeCrashID</u>	crashalcoh	excsspdind	ped_pos	drvr_injur	hit_run	drvr_estsp	exceedSpeed	speed_limi
1	"No"	"No"	"Non-Roadway - Parking Lot / Other "	"Unknown Injury"	"No"	"Unknown"	-1	5