STAT 210: Quiz #5   Name: <u>SOLUTION</u>
Fall 2017
Points: 20

<u>Goal</u>: Investigate the relationship between Arrest Cody Type [Felonies (F) and Misdemeanors (M) only] and Race/Descent Code [Black (B), Hispanic(H), White(W), and Other(O) only]. The effect of Gender and Time will also be considered to determine its impact on this relationship.

<u>Getting the data</u>

- Data Link: https://data.lacity.org/A-Safe-City/Arrest-Data-from-2010-to-Present/yru6-6re4
- To download data, Download near the upper-right corner of this webpage. Select CSV and save a copy of the data onto your laptop.
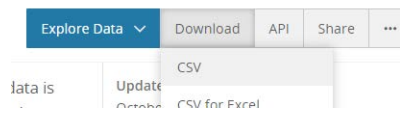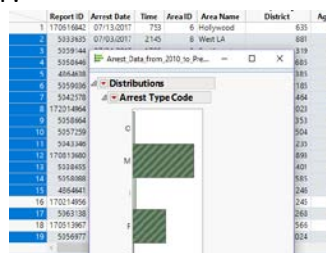

- Once the file has been downloaded to your laptop, we will open this dataset in JMP. Open JMP, click File > Open. In the Dialog window, select the data you downloaded above. The type of file downloaded above is a *.csv file – you may needed to change the type of file in the Open Data Dialog box to view the data file. The file will take a few seconds to load and should load 17 columns and about 1.15 million rows.

<u>Preparing the data</u>

- To subset out only the rows for which the Arrest Type Code is either Felony or Misdemeanor, i.e. Arrest Type Code = F or Arrest Type Code = M. The number of rows after subsetting should be about 1.079 million rows.

|	
Select Analyze > Distribution. Place Arrest Type Code in the Y, Columns box. Next, holding the Ctrl (or Cmd on MAC) button down, click the M and F bars on the barplot provided. This will select all rows in the dataset for which Arrest Type Code = M or F.	To pull out (or subset) these rows, select Table > Subset. In the Subset dialog box, make sure Selected Rows in specified under Rows and All columns is specified under Columns. You can provide a name for the subsetted data in the Output table name box.
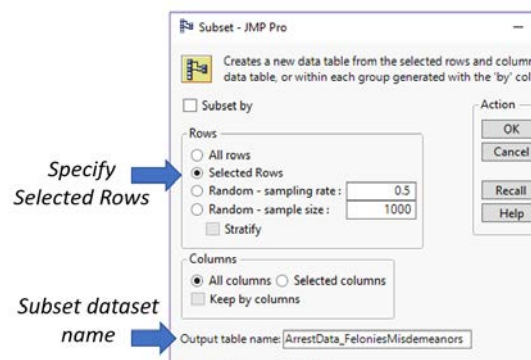
- The following will recoded the Descent Code variable into four categories – Black, Hispanic, White, and Other.

Select the Descent Code variable. Select Cols > Recode.
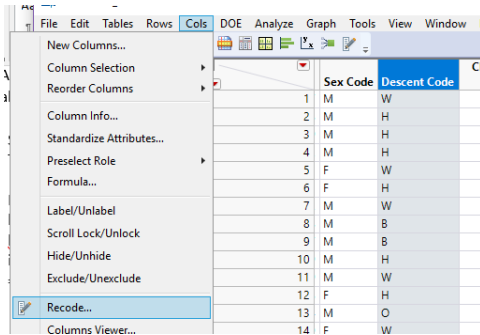
Do not change the specification for B, H, or W in the New Values column. Change the Descent Codes for all remaining categories to Other (O). Click the Done button to recode this variable.
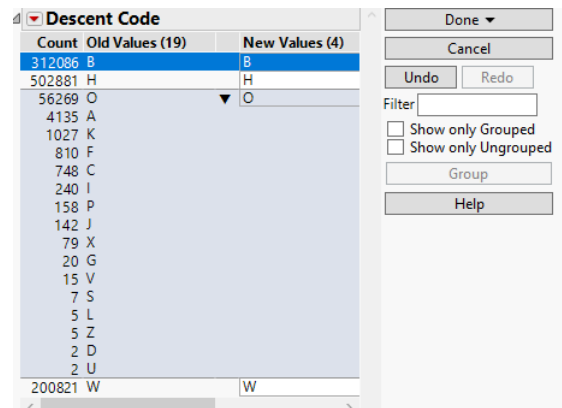

Questions.

1. Create the following plot to investigate the relationship between Descent Code and Arrest Type Code. Delete my plot and copy-paste your plot in its place.
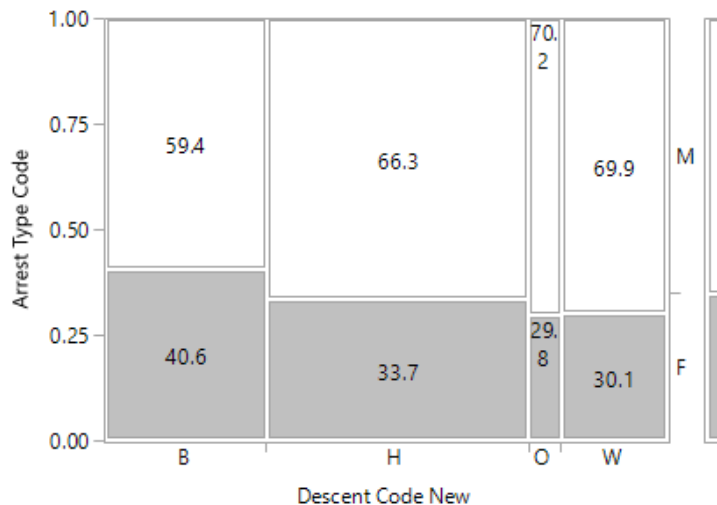

Write a short description (2 – 4 sentences) describing the relationship between Arrest Type Code and Descent Code. Note: Felonies are a more severe arrest type than misdemeanors. (5 pts)

```
Descent Code = B, i.e. Blacks, appear to have the highest rate of
Felonies (F) with about 40%.  Descent Code = Other (O) appears to
have the lowest rate of Felonies at 29.8%, Whites are just
slightly above this rate at just over 30%.
```

2. Using a Local Data Filter for Sex Code, i.e. Gender, determine the effect of Gender on the relationship established above. Again, write a short description discussing the impact of Gender on the relationship established above. (5 pts)

Sex Code = Female

Sex Code = Male
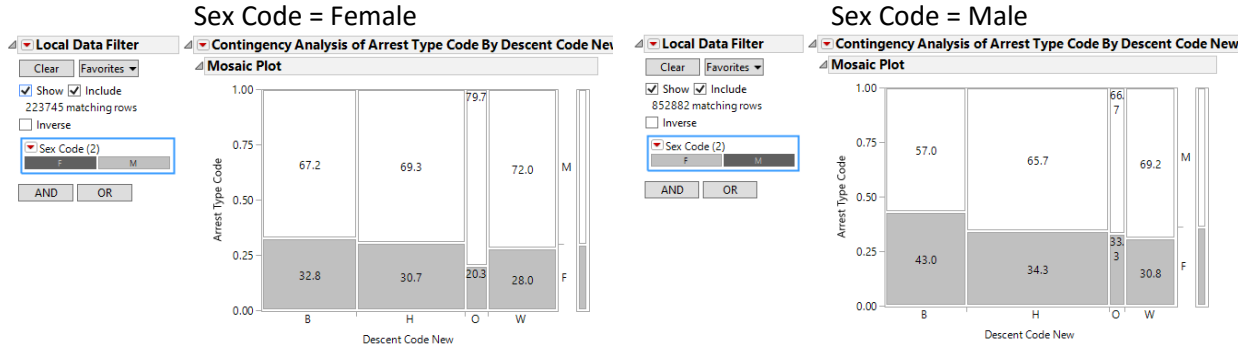
Combining Descent Code with Gender using concatenate function in JMP
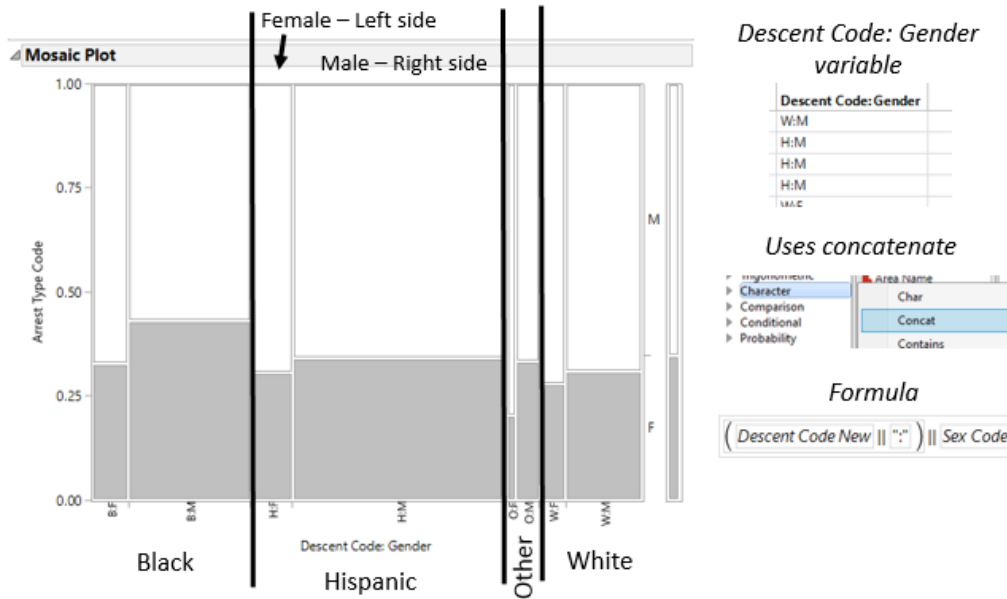

```
For each Descent Code, the Felony rate for Females is lower than
Males.  The Blacks appear to have the most amount of discrepancy
between Females and Males with about 10% difference. Whites appear to
have the least amount of discrepancy between Females and Males.
```

3. 2013Using a Local Data Filter for Year, investigate how the relationship between Arrest Code Type and Descent Code has changed from 2010 to 2017.

Creating the Year variable

Click the Arrest Date column, select Cols > New Columns. In the Column Name box, specify a name, i.e. Year, change the Data Type to Character and Modeling Type to Nominal.

Use the Year() function to pull the Year off from the Arrest Date. The Year() function is found under the Date Time list of functions.

$$Year \left(Arrest\ Date \right)$$

Write a short description discussing how the relationship between Arrest Type and Descent Code has changed over time. (5 pts)
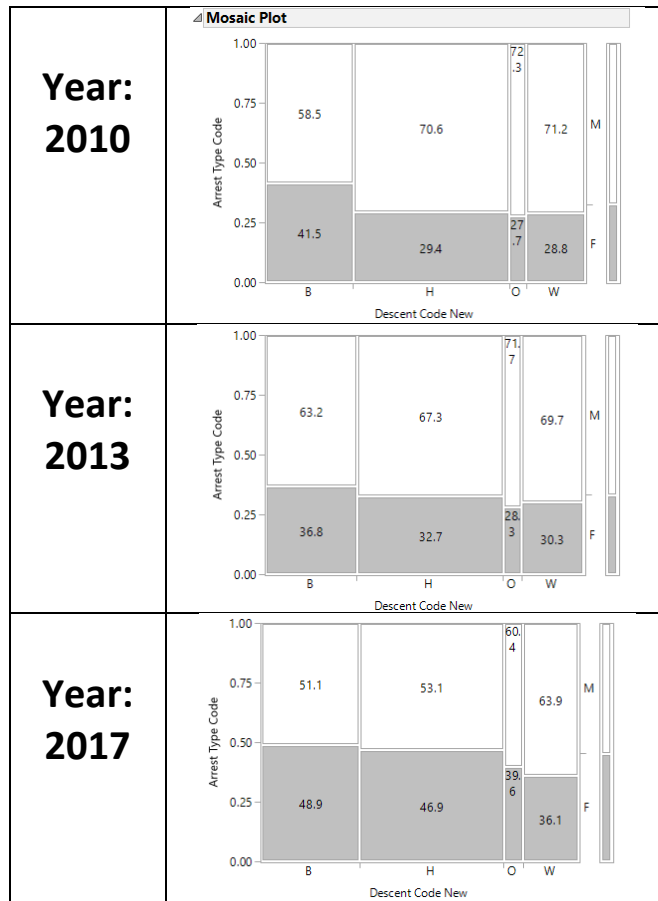

Year appears to have a consider impact on the relationship between Descent Code and Arrest Type. The pattern appears to

change somewhat between 2012 and 2013 and again between 2016 and
2017. Overall, the rates of Felonies dropped by about 6-8% from
2013 – 2016. Blacks consistently had the highest rate of Felonies
-- regardless of Year. The felony rates between races were most
similar in 2013.

4. Finally, using a Local Data Filter for Age, investigate the impact of Age on the relationship
    between Arrest Code Type and Descent Code. The Age variable will need to binned into Age
    Groups, i.e. 0-10, 10-20, 20-30, etc.

    Creating the Age Binned column
    Highlight the Age column, select Cols > Utilities > Make Binning Formula. Specify Offset = 0, and
    Width = 10. Click Make Formula Columns to create the Age Binned column.
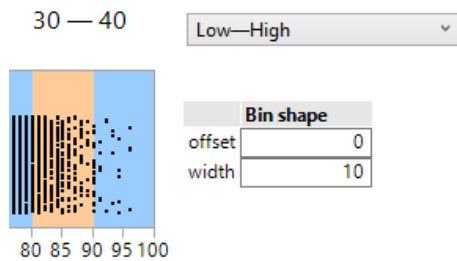
    Write a short description discussing the impact of Age on the relationship between Arrest Type
    and Descent Code. (5 pts)
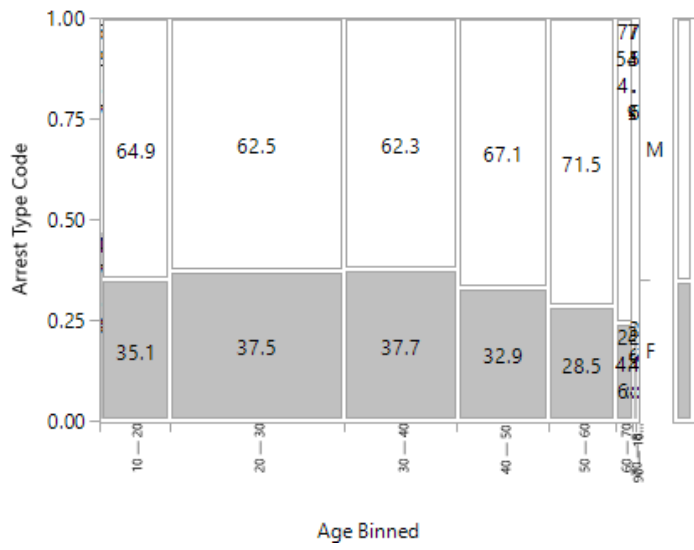
The relationship between Age and Arrest Type is what I expected.
Those in their 20s-30s had the highest rate of felonies and this
rate decreases as Age increases. For those over 60, Felonies make
up about 25% of the Arrest Types – which seems pretty high.