SAS Homework: Wildfire analysis in the state of North Carolina

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Introduction

Every single year human lives, ecosystems and properties are at risk due to wildfires in the state of North-Carolina (NC). Wildfires harm both air and water quality while efforts to fight wildfires are expensive and put emergency personel in harms way. A better understanding of the dynamics behind destructive wildfires can aid prevention efforts. This report analyses the causes, timings and sizes of wildfires accross different counties in NC. The data is obtained from the United States Forest Service (USFS) and spans accross 1992 to 2015.

The analyses in this report have been performed on a dataset containing the following categorical variables: the county the fire occured in, it's fips code, the year and month the fire was discovered in, the official cause with a matching cause code and the fire size binned into seven categories. The continuous variables studied are the discovery date of the fire, the fire size and the coordinates of the fire. The only missing values in the dataset are for the variables county and the fips code. The county variable also contained several erroneousness entrees, all of which were correctable. Below the first 5 rows of the dataset are depicted as an example.

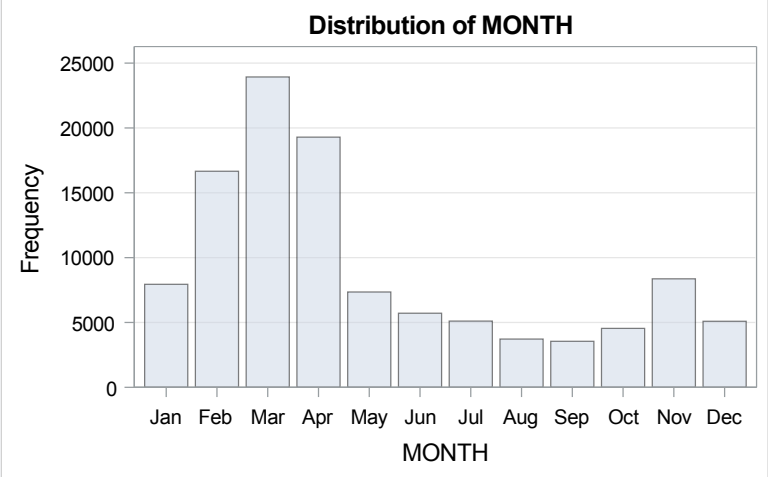
Obs	Year	Discovery date	Cause code	Cause	Fire size	Fire size class	Latitude	Longitude	State	County	Fips code	Month
1	2005	11MAR05	2	Equipment Use	0.6	B	35.23	-82.88	NC	Buncombe	21	Mar
2	2005	27JAN05	7	Arson	50.3	C	35.00	-83.35	NC	Macon	113	Jan
3	2005	06FEB05	7	Arson	0.1	A	35.93	-81.72	NC	Caldwell	27	Feb
4	2005	12FEB05	5	Debris Burnin	125	D	36.00	-81.59	NC	Caldwell	27	Feb
5	2005	16APR05	5	Debris Burnin	25	C	35.99	-81.85	NC	Avery	11	Apr

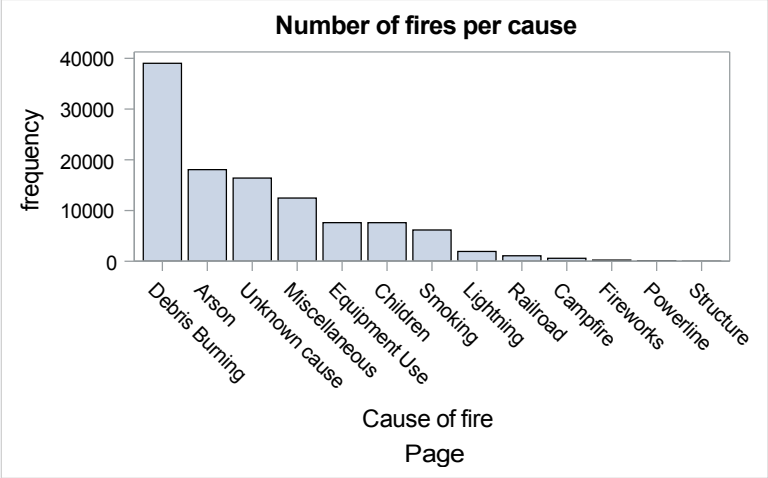
Data has been formatted: months and counties are formatted as text rather than numbers and labels with information are added to each variable. Above a sample of the data set that will be used for further analysis

The FREQ Procedure

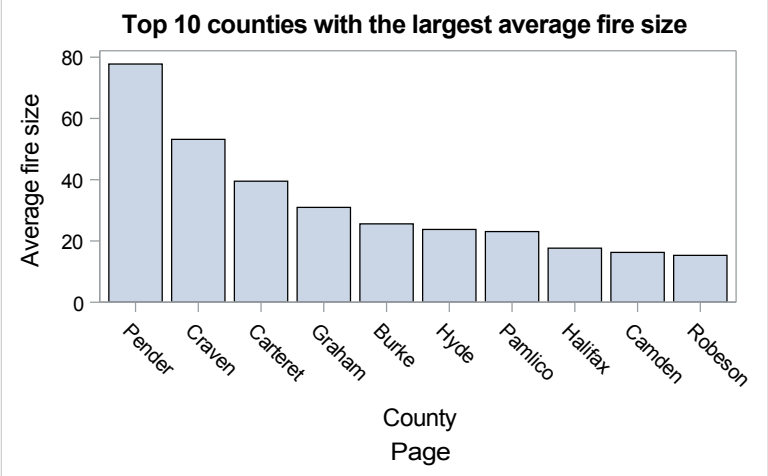
Number of Variable Levels				
Variable	Label	Levels	Missing Levels	Nonmissing Levels
STATE	Two-letter alphabetic code for the state in which the fire burned (or originated), based on the nominal designation in the fire report.	1	0	1
COUNTY	County, or equivalent, in which the fire burned (or originated), based on nominal designation in the fire report.	101	1	100
FIPS_CODE	Three-digit code from the Federal Information Process Standards (FIPS) publication 6-4 for representation of counties and equivalent entities.	101	1	100
FIRE_YEAR	Calendar year in which the fire was discovered or confirmed to exist.	24	0	24
STAT_CAUSE_CODE	Code for the (statistical) cause of the fire.	13	0	13
STAT_CAUSE_DESCR	Cause of the fire.	13	0	13

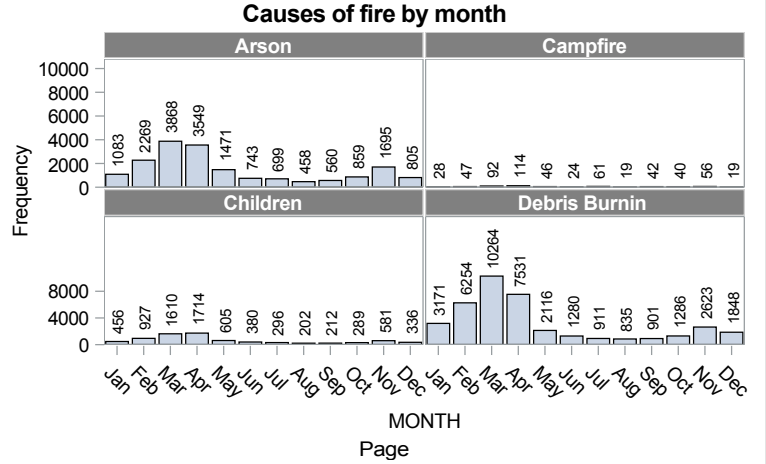
The FREQ Procedure

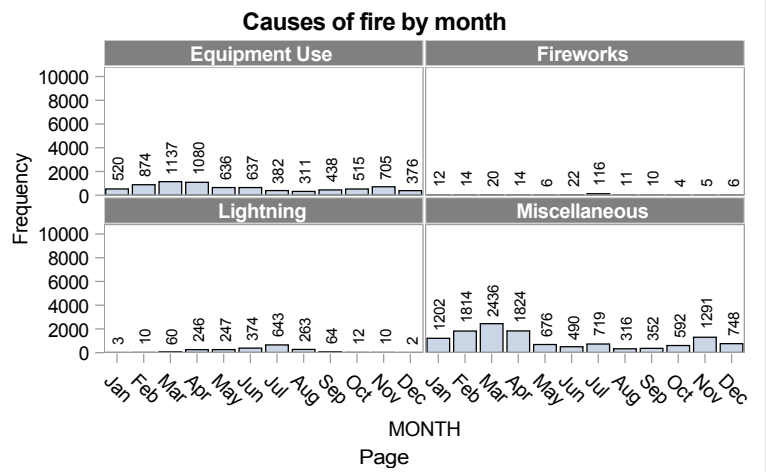


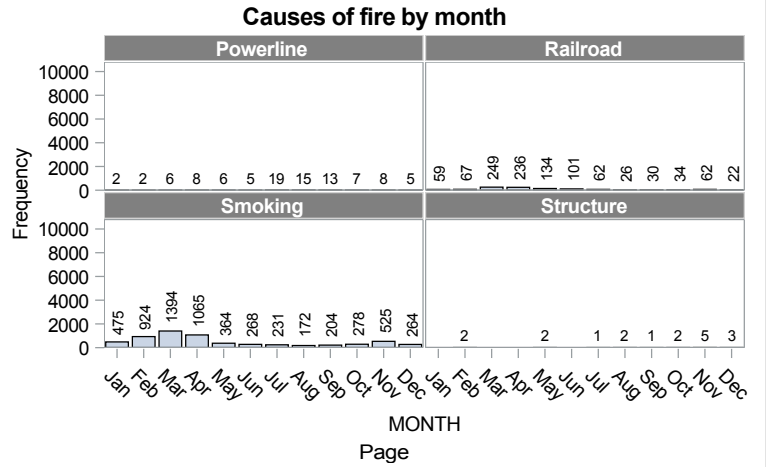


Obs	COUNTY	_TYPE_	_FREQ_	n_obs	average	lower_CI	upper_CI
1	Pender	1	511	511	77.759041096	-42.45166728	197.96974947









	Fire Size: Estimate of acres within the final perimeter of the fire			
	Number of fires	**Total size**	**Average size**	**Maximum size**
Top 3 causes of fire				
Debris Burnin	39020	135370.5	3.469	2738.000
Arson	18059	175660.9	9.727	24600.00
Equipment Use	7611	39568.33	5.199	2300.000

The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer