Homework 3

Due: Thursday, October 14th (before 11:59 pm) on GauchoSpace.

Instructions: Show partial screenshots of your output in a pdf/doc file. Submit your code separately as a SAS program file.

1. Use the **`MILITARY`** data set from the *data1* folder on GauchoSpace.
    a) Sort the data set by **`State`**, **`Type`**, and **`City`**. Output the sorted data set into a temporary data set called **`military_sorted`**.
    b) Use the sorted data set to create a listing report that
        i. Has the title 'US Military' on the first line.
        ii. Has the title 'Air Force and Army Airports' on the third line.
        iii. Has the footnote 'Sorted by State, Military Branch, and City' on the first line.
        iv. Displays the variables: **`State`**, **`Type`**, **`City`**, **`Airport`** (in this order).
        v. Displays "State Abbreviation" as a column header for State, and "Military Branch" for Type.
        vi. Only displays observations where the military branch is the Air Force or the Army.
        vii. Groups the observations by State, with different states on separate pages.
        viii. Display the total number of observations in each group.
        ix. Displays page numbers; first page is number 3.
        x. Does not display date and time.

For exercises 2-4, use the **`CarAccidents.dat`** file posted on GauchoSpace. This raw data file contains information on car accidents in the months of January and February of 2014. The table below provides the complete record layout of the raw data file.

Variable Name	Columns	Data Type
Reference	1-7	Character
EastRef	10-15	Numeric
NorthRef	17-22	Numeric
nVehicles	24	Numeric
nCasualties	26	Numeric
Day	29-38	Character (mm/dd/yyyy)
Time	40-43	Numeric
RoadClass	45	Numeric
RoadSurface	47	Numeric

1(a)

Obs	Type	Code	City	State	Country	Airport	Awards
1	Air Force	EDF	Anchorage	AK	USA	Elmendorf Air Force Base	98
2	Air Force	EIL	Fairbanks	AK	USA	Eielson Air Force Base	15
3	Air Force	SYA	Shemya Island	AK	USA	Eareckson Air Force Station	47
4	Army	BIG	Delta Junction/Fort	AK	USA	Allen Army Air Field	92
5	Air Force	GUN	Montgomery	AL	USA	Gunter Air Force Base	20
6	Air Force	MXF	Montgomery	AL	USA	Maxwell Air Force Base	38
7	Army	OZR	Fort Rucker (Ozark)	AL	USA	Cairns Army Air Field	62
8	Army	HEY	Fort Rucker/Ozark	AL	USA	Hanchey Army Heliport	71
9	Army	LOR	Fort Rucker/Ozark	AL	USA	Lowe Army Heliport	18
10	Army	FHK	Fort Zucker/Ozark	AL	USA	Knox Army Heliport	17
11	Naval	NBJ	Foley	AL	USA	Barin Naval Outlying Field	93
12	Naval	NFD	Summerdale	AL	USA	Summerdale Naval Outlying Field	9
13	Air Force	LRF	Jacksonville	AR	USA	Little Rock Air Force Base	4
14	Army	CCA	Fort Chaffee	AR	USA	Chaffee Army Air Field	76
15	Air Force	GBN	Gila Bend	AZ	USA	Gila Bend Air Force Auxiliary Airport	18
16	Air Force	LUF	Glendale/Phoenix	AZ	USA	Luke Air Force Base	37
17	Air Force	DMA	Tucson	AZ	USA	Davis-Monthan Air Force Base	26
18	Army	LGF	Yuma Proving Ground	AZ	USA	Laguna Army Air Field	74
19	Air Force	EDW	Edwards	CA	USA	Edwards Air Force Base	72
20	Air Force	SUU	Fairfield	CA	USA	Travis Air Force Base	37
21	Air Force	VBG	Lompoc	CA	USA	Vandenberg Air Force Base	28
22	Air Force	BAB	Marysville	CA	USA	Beale Air Force Base	38
23	Air Force	MCC	Sacramento	CA	USA	Mc Clellan Air Force Base	70

1(b)

US Military

Air Force and Army Airports

State Abbreviation=AK

Obs	State Abbreviation	Military Branch	City	Airport
1	AK	Air Force	Anchorage	Elmendorf Air Force Base
2	AK	Air Force	Fairbanks	Eielson Air Force Base
3	AK	Air Force	Shemya Island	Eareckson Air Force Station
4	AK	Army	Delta Junction/Fort	Allen Army Air Field

N = 4

Sorted by State, Military, Branch, and City

US Military

Air Force and Army Airports

State Abbreviation=AL

Obs	State Abbreviation	Military Branch	City	Airport
5	AL	Air Force	Montgomery	Gunter Air Force Base
6	AL	Air Force	Montgomery	Maxwell Air Force Base
7	AL	Army	Fort Rucker (Ozark)	Cairns Army Air Field
8	AL	Army	Fort Rucker/Ozark	Hanchey Army Heliport
9	AL	Army	Fort Rucker/Ozark	Lowe Army Heliport
10	AL	Army	Fort Zucker/Ozark	Knox Army Heliport

N = 6

Sorted by State, Military, Branch, and City

US Military

Air Force and Army Airports

State Abbreviation=VA

Obs	State Abbreviation	Military Branch	City	Airport
128	VA	Air Force	Hampton	Langley Air Force Base
129	VA	Army	Fort Belvoir	Davison Army Air Field
130	VA	Army	Fort Eustis	Felker Army Air Field

N = 3

Sorted by State, Military, Branch, and City

US Military

Air Force and Army Airports

State Abbreviation=WA

Obs	State Abbreviation	Military Branch	City	Airport
132	WA	Air Force	Moses Lake	Larson Air Force Base
133	WA	Air Force	Spokane	Fairchild Air Force Base
134	WA	Air Force	Tacoma	McChord Air Force Base
135	WA	Army	Fort Lewis (Tacoma)	Gray Army Air Field
136	WA	Army	Yakima	Yakima Firing Center Army Air Field

N = 5

Sorted by State, Military, Branch, and City

US Military

Air Force and Army Airports

State Abbreviation=WY

Obs	State Abbreviation	Military Branch	City	Airport
137	WY	Air Force	Cheyenne	Francis E. Warren Air Force Base

N = 1

Sorted by State, Military, Branch, and City

Lighting	49	Numeric
Weather	51	Numeric
Class	53	Numeric
Severity	55	Numeric
Gender	57	Numeric
Age	59-60	Numeric
VehicleType	62-63	Numeric

2. Reading Raw Data Using Column Input
    a) Create a SAS data set named **work.CarAccidents**, by writing a DATA step that only uses column input, and reads in the following variables: **Reference**, **Day**, **Time**, **Severity**, **nVehicles**, and **VehicleType**.
    b) Read the log to answer the following questions:
        i. How many records were read from the raw data file? 106 records
        ii. How many observations does the resulting (output) SAS data set contain? 106 obs.
        iii. How many variables does the resulting (output) SAS data set contain? 6 var.
    c) Use a procedure to display the descriptor portion of the data set. Of what type is the variable **Day**? Variable Day is a character type
    d) Use a procedure to create a listing report that displays the data portion of the data set. Assign an appropriate title. Do not display the observation column. Do not display page numbers. Do display the date and time. Set the page size to 120 and the line size to 96.

3. Reading Raw Data Using Formatted Input
    a) Create another SAS data set named **work.CarAccidents2** by writing a DATA step that only uses formatted input to read in and create the following variables: **Reference**, **Day**, **Time**, **Weather**, **nVehicles**, and **nCasualties**. Use pointer control **AND** an appropriate SAS date informat to store the values of **Day**. Of what type is the variable **Day**? Numeric type
    b) Use a procedure to create a listing report that displays the data portion of the data set. Assign an appropriate title. Do not display the date and time, but do display page numbers starting at page 1. Set the line size to 64. Display the values of **Day** using a 14OCT2021 format.

4. Changing Variable Attributes
    a) Modify the DATA Step of the previous program to assign the following attributes to the **Reference**, **Day**, **Weather**, **nVehicles**, and **nCasualties** variables.
        i. Assign the label 'Reference Number' to the **Reference** variable.
        ii. Assign the label 'Date of Accident' to the **Day** variable.
        iii. Assign the label 'Weather Condition' to the **Weather** variable.

iv. Assign the label 'Number of Vehicles' to the **`nVehicles`** variable.
v. Assign the label 'Number of Casualties' to the **`nCasualties`** variable.
vi. Run PROC CONTENTS to verify that the changes were made.

b) Use PROC DATASETS to change the following attributes of the **`Reference`** and **`Day`** variables:
i. Assign the DATE7 format to the **`Day`** variable.
ii. Assign the label 'Reference ID' to the **`Reference`** variable.
iii. Run PROC CONTENTS to verify that the changes were made.

2d)

Severity of Car Accidents by Vehicle Type

Reference	Day	Time	Severity	nVehicles	VehicleType	nCasualties
1112091	01/01/2014	1840	3	2	9	1
1180869	01/08/2014	1430	3	3	9	2
1180869	01/08/2014	1430	3	3	9	2
11A0238	01/10/2014	817	3	3	9	2
11A0238	01/10/2014	817	3	3	9	2
11A0628	01/10/2014	1220	3	2	9	1
11S1208	01/28/2014	1828	3	3	9	1
1211556	01/28/2014	2000	3	1	9	1
1221002	02/02/2014	1531	3	1	9	1
1270266	02/07/2014	824	3	4	9	2
1270266	02/07/2014	824	3	4	9	2
12F1262	02/25/2014	1800	3	2	1	1
12H1186	02/17/2014	1728	3	1	9	1
12H1210	02/17/2014	1735	3	2	11	1
12H1381	02/17/2014	1905	3	2	9	1
12I0039	02/18/2014	46	3	1	9	1
12I0740	02/18/2014	1320	3	2	1	1
12I0834	02/18/2014	1422	3	1	9	1
12I1006	02/18/2014	1545	3	2	9	3
12I1006	02/18/2014	1545	3	2	9	3
12I1006	02/18/2014	1545	3	2	9	3
12I1203	02/18/2014	1720	3	2	1	1
12I1281	02/18/2014	1802	3	1	9	1
12I1450	02/18/2014	1944	3	2	1	1
12I1578	02/18/2014	2052	3	2	3	1
12I1769	02/18/2014	2318	3	2	3	1
12J0189	02/19/2014	655	3	2	1	1
12J0433	02/19/2014	1028	3	2	4	1
12J0994	02/19/2014	1550	3	2	9	1

3b)

Weather related Car Accidents

Obs	Reference	Day	Time	Weather	nVehicles	nCasualties
1	1112091	01JAN2014	1840	2	2	1
2	1180869	08JAN2014	1430	1	3	2
3	1180869	08JAN2014	1430	1	3	2
4	11A0238	10JAN2014	817	1	3	2
5	11A0238	10JAN2014	817	1	3	2
6	11A0628	10JAN2014	1220	1	2	1
7	11S1208	28JAN2014	1828	2	3	1
8	1211556	28JAN2014	2000	1	1	1
9	1221002	02FEB2014	1531	1	1	1
10	1270266	07FEB2014	824	1	4	2
11	1270266	07FEB2014	824	1	4	2
12	12F1262	25FEB2014	1800	2	2	1
13	12H1186	17FEB2014	1728	2	1	1
14	12H1210	17FEB2014	1735	1	2	1
15	12H1381	17FEB2014	1905	2	2	1
16	12I0039	18FEB2014	46	1	1	1
17	12I0740	18FEB2014	1320	1	2	1
18	12I0834	18FEB2014	1422	1	1	1
19	12I1006	18FEB2014	1545	1	2	3
20	12I1006	18FEB2014	1545	1	2	3
21	12I1006	18FEB2014	1545	1	2	3
22	12I1203	18FEB2014	1720	1	2	1
23	12I1281	18FEB2014	1802	1	1	1
24	12I1450	18FEB2014	1944	1	2	1

4a)

Alphabetic List of Variables and Attributes					
#	Variable	Type	Len	Format	Label
2	Day	Num	8	MMDDYY10.	Date of Incident
1	Reference	Char	8		Reference Number
3	Time	Char	4		
4	Weather	Char	1		Weather Condition
6	nCasualties	Char	1		Number of Casualties
5	nVehicles	Char	1		Number of Vehicles

4b)

Alphabetic List of Variables and Attributes					
#	Variable	Type	Len	Format	Label
2	Day	Num	8	DATE7.	
1	Reference	Char	8		Reference ID
4	Severity	Char	1		
3	Time	Char	4		
6	VehicleType	Char	2		
5	nVehicles	Char	1		