Program Summary - Program 1.sas

Execution Environment

Author:	chwang10
File:	/home/chwang10/Program 1.sas
SAS Platform:	Linux LIN X64 3.10.0-1062.9.1.el7.x86_64
SAS Host:	ODAWS04-USW2.ODA.SAS.COM
SAS Version:	9.04.01M6P11072018
SAS Locale:	en_US
Submission Time:	9/9/2020, 3:44:06 AM
Browser Host:	104.220.37.66
User Agent:	Mozilla/5.0 (Macintosh; Intel Mac OS X 10_14_6) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/85.0.4183.83 Safari/537.36
Application Server:	ODAMID00-USW2.ODA.SAS.COM

Code: Program 1.sas

```
* Programmed by Charles Hwang  *
* Coded in SAS OnDemand        *
* Wednesday, September 9, 2020 *
* Course: STAT 403             *
* Title: Homework 1            *;

/* 1a */ Proc Import out=data1 datafile="/home/chwang10/PolarVortex.xlsx" dbms=xlsx;
Run;

/* 1b */ Data PolarVortex;
Set data1;
AvgTempF=AvgTemp*9/5+32;
AvgWindMPH=2.2369*AvgWind;
WindChill=35.74+.6215*AvgTempF-35.37*AvgWindMPH**.16+0.4275*AvgTempF*AvgWindMPH**.16;
Run;

/* 1c(1) */ * (F°)=9(C°)/5+32 ;
/* 1c(2) */ * AvgWindMPH=2.2369*AvgWind;
/* 1c(3) */ * WindChill=35.74+.6215*AvgTempF-35.37*AvgWindMPH**.16+0.4275*AvgTempF*AvgWindMPH**.16;

/* 1d */ Proc Means data=PolarVortex;
Var WindChill;
Run; * The mean wind chill is 15.60824. ;

/* 1e */ Symbol value="circle" color=blue I=join;
Proc Gplot data=PolarVortex;
Plot WindChill*Date/vref=15.60824;
Run;

/* 1f */ Proc Sort data=PolarVortex;
By WindChill;
Run;

/* 1g */ Proc Print data=PolarVortex;
Var Date WindChill;
Run;

/* 2a */ Data normaldist;
Do i = 1 to 1000;
X=25+rannor(-1)*2.7;
Output;
End;
Drop i;
Run;

/* 2a(i) */ Proc Means data=normaldist;
Var X;
Run; * x̄ = 25.1007487, s = 2.7662398 ;
/* 2a(ii) */ Proc Univariate data=normaldist noprint;
Hist X /kernel;
Run;
/* 2a(iii) */ Data Normal20;
Do i = 1 to 20;
X20=25+rannor(-1)*2.7;
Output;
End;
Drop i;
Proc Univariate data=Normal20 noprint;
Hist X20 /kernel;
Run;

/* 2b(i) */ Data ExpDist;
```

```
Do i = 1 to 1000;
X=-10*log(ranuni(-1));
Output;
End;
Drop i;
Run;

/* 2b(ii) */ Proc Means data=ExpDist;
Var X;
Run; * The standard deviation appears to be very close to the mean. This is consistent with the properties of the exponential distribution

/* 2b(iii) */ Proc Univariate data=ExpDist noprint;
Hist X /kernel;
Run;
```

Log: Program 1.sas

Notes (31)

```
1          OPTIONS NONOTES NOSTIMER NOSOURCE NOSYNTAXCHECK;
70
71         * Programmed by Charles Hwang  *
72         * Coded in SAS OnDemand        *
73         * Wednesday, September 9, 2020 *
74         * Course: STAT 403             *
75         * Title: Homework 1            *;
76
77         /* 1a */
77       !          Proc Import out=data1 datafile="/home/chwang10/PolarVortex.xlsx" dbms=xlsx;
78         Run;

NOTE: Import cancelled.  Output dataset WORK.DATA1 already exists.  Specify REPLACE option to overwrite it.
NOTE: The SAS System stopped processing this step because of errors.
NOTE: PROCEDURE IMPORT used (Total process time):
      real time           0.00 seconds
      user cpu time       0.00 seconds
      system cpu time     0.00 seconds
      memory              716.37k
      OS Memory           35220.00k
      Timestamp           09/09/2020 10:44:05 AM
      Step Count                        233  Switch Count  0
      Page Faults                       0
      Page Reclaims                     138
      Page Swaps                        0
      Voluntary Context Switches        3
      Involuntary Context Switches      0
      Block Input Operations            0
      Block Output Operations           0

79
80         /* 1b */


80       !          Data PolarVortex;
81         Set data1;
82         AvgTempF=AvgTemp*9/5+32;
83         AvgWindMPH=2.2369*AvgWind;
84         WindChill=35.74+.6215*AvgTempF-35.37*AvgWindMPH**.16+0.4275*AvgTempF*AvgWindMPH**.16;
85         Run;

NOTE: There were 59 observations read from the data set WORK.DATA1.
NOTE: The data set WORK.POLARVORTEX has 59 observations and 6 variables.
NOTE: DATA statement used (Total process time):
      real time           0.00 seconds
      user cpu time       0.00 seconds
      system cpu time     0.00 seconds
      memory              1060.37k
      OS Memory           35244.00k
      Timestamp           09/09/2020 10:44:05 AM
      Step Count                        234  Switch Count  2
      Page Faults                       0
      Page Reclaims                     126
      Page Swaps                        0
      Voluntary Context Switches        11
      Involuntary Context Switches      0
      Block Input Operations            0
      Block Output Operations           264


86
87         /* 1c(1) */ * (F°)=9(C°)/5+32 ;
88         /* 1c(2) */ * AvgWindMPH=2.2369*AvgWind;
89         /* 1c(3) */ * WindChill=35.74+.6215*AvgTempF-35.37*AvgWindMPH**.16+0.4275*AvgTempF*AvgWindMPH**.16;
90
91         /* 1d */
91       !          Proc Means data=PolarVortex;
92         Var WindChill;
93         Run;

NOTE: There were 59 observations read from the data set WORK.POLARVORTEX.
NOTE: PROCEDURE MEANS used (Total process time):
      real time           0.02 seconds
      user cpu time       0.01 seconds
      system cpu time     0.00 seconds
```

```
      memory              8273.90k
      OS Memory           41164.00k
      Timestamp           09/09/2020 10:44:05 AM
      Step Count                        235  Switch Count  1
      Page Faults                       0
      Page Reclaims                     1608
      Page Swaps                        0
      Voluntary Context Switches        17
      Involuntary Context Switches      0
      Block Input Operations            0
      Block Output Operations           8


93       !      * The mean wind chill is 15.60824. ;
94
95         /* 1e */ Symbol value="circle" color=blue I=join;
96         Proc Gplot data=PolarVortex;
97         Plot WindChill*Date/vref=15.60824;
98         Run;

99
100        /* 1f */

NOTE: There were 59 observations read from the data set WORK.POLARVORTEX.
NOTE: PROCEDURE GPLOT used (Total process time):
      real time           0.16 seconds
      user cpu time       0.15 seconds
      system cpu time     0.02 seconds
      memory              7525.03k
      OS Memory           39448.00k
      Timestamp           09/09/2020 10:44:06 AM
      Step Count                        236  Switch Count  0
      Page Faults                       0
      Page Reclaims                     1067
      Page Swaps                        0
      Voluntary Context Switches        0
      Involuntary Context Switches      0
      Block Input Operations            0
      Block Output Operations           352


100      !          Proc Sort data=PolarVortex;
101        By WindChill;
102        Run;

NOTE: There were 59 observations read from the data set WORK.POLARVORTEX.
NOTE: The data set WORK.POLARVORTEX has 59 observations and 6 variables.
NOTE: PROCEDURE SORT used (Total process time):
      real time           0.00 seconds
      user cpu time       0.00 seconds
      system cpu time     0.00 seconds
      memory              1047.25k
      OS Memory           37804.00k
      Timestamp           09/09/2020 10:44:06 AM
      Step Count                        237  Switch Count  2
      Page Faults                       0
      Page Reclaims                     116
      Page Swaps                        0
      Voluntary Context Switches        16
      Involuntary Context Switches      0
      Block Input Operations            0
      Block Output Operations           264


103
104        /* 1g */
104      !          Proc Print data=PolarVortex;
105        Var Date WindChill;
106        Run;

NOTE: There were 59 observations read from the data set WORK.POLARVORTEX.
NOTE: PROCEDURE PRINT used (Total process time):
      real time           0.05 seconds
      user cpu time       0.05 seconds
      system cpu time     0.00 seconds
      memory              943.00k
      OS Memory           37544.00k
      Timestamp           09/09/2020 10:44:06 AM
      Step Count                        238  Switch Count  0
      Page Faults                       0
      Page Reclaims                     61
      Page Swaps                        0
      Voluntary Context Switches        0
      Involuntary Context Switches      0
      Block Input Operations            0
      Block Output Operations           16


107
108        /* 2a */
108      !          Data normaldist;
109        Do i = 1 to 1000;
110        X=25+rannor(-1)*2.7;
111        Output;
112        End;
113        Drop i;
114        Run;

NOTE: The data set WORK.NORMALDIST has 1000 observations and 1 variables.
```

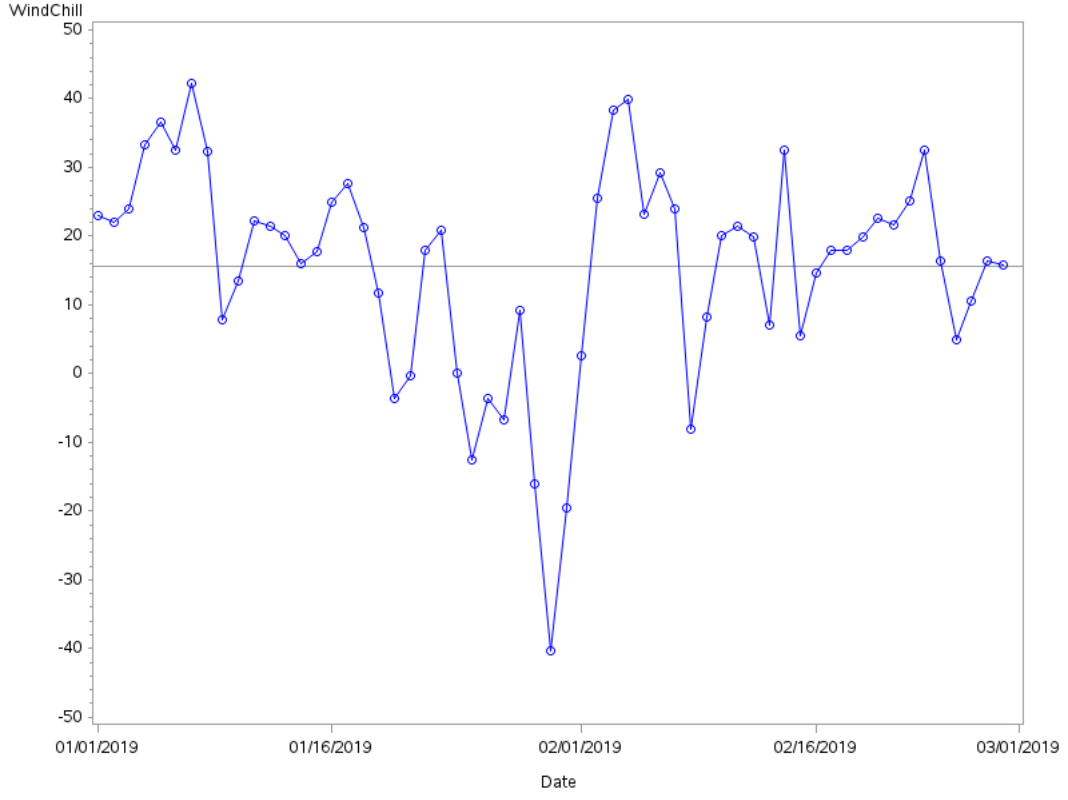
```
NOTE: DATA statement used (Total process time):
      real time           0.00 seconds
      user cpu time       0.00 seconds
      system cpu time     0.00 seconds
      memory              780.93k
      OS Memory           37544.00k
      Timestamp           09/09/2020 10:44:06 AM
      Step Count                        239  Switch Count  2
      Page Faults                       0
      Page Reclaims                     87
      Page Swaps                        0
      Voluntary Context Switches        11
      Involuntary Context Switches      0
      Block Input Operations            0
      Block Output Operations           264


115
116        /* 2a(i) */
116      !             Proc Means data=normaldist;
117        Var X;
118        Run;

NOTE: There were 1000 observations read from the data set WORK.NORMALDIST.
NOTE: PROCEDURE MEANS used (Total process time):
      real time           0.01 seconds
      user cpu time       0.01 seconds
      system cpu time     0.01 seconds
      memory              6915.00k
      OS Memory           43724.00k
      Timestamp           09/09/2020 10:44:06 AM
      Step Count                        240  Switch Count  1
      Page Faults                       0
      Page Reclaims                     1608
      Page Swaps                        0
      Voluntary Context Switches        18
      Involuntary Context Switches      0
      Block Input Operations            0
      Block Output Operations           16


118      !      * x̄ = 25.1007487, s = 2.7662398 ;
119        /* 2a(ii) */
119      !              Proc Univariate data=normaldist noprint;
120        Hist X /kernel;
121        Run;

NOTE: The normal kernel estimate for c=0.7852 has a bandwidth of 0.698 and an AMISE of 0.0005.
NOTE: PROCEDURE UNIVARIATE used (Total process time):
      real time           0.20 seconds
      user cpu time       0.09 seconds
      system cpu time     0.01 seconds
      memory              18269.43k
      OS Memory           51068.00k
      Timestamp           09/09/2020 10:44:06 AM
      Step Count                        241  Switch Count  0
      Page Faults                       0
      Page Reclaims                     4103
      Page Swaps                        0
      Voluntary Context Switches        780
      Involuntary Context Switches      0
      Block Input Operations            0
      Block Output Operations           824


122        /* 2a(iii) */
122      !               Data Normal20;
123        Do i = 1 to 20;
124        X20=25+rannor(-1)*2.7;
125        Output;
126        End;
127        Drop i;

NOTE: The data set WORK.NORMAL20 has 20 observations and 1 variables.
NOTE: DATA statement used (Total process time):
      real time           0.00 seconds
      user cpu time       0.01 seconds
      system cpu time     0.00 seconds
      memory              775.28k
      OS Memory           50600.00k
      Timestamp           09/09/2020 10:44:06 AM
      Step Count                        242  Switch Count  2
      Page Faults                       0
      Page Reclaims                     108
      Page Swaps                        0
      Voluntary Context Switches        14
      Involuntary Context Switches      0
      Block Input Operations            0
      Block Output Operations           264


128        Proc Univariate data=Normal20 noprint;
129        Hist X20 /kernel;
130        Run;

NOTE: The normal kernel estimate for c=0.7852 has a bandwidth of 1.7738 and an AMISE of 0.0099.
NOTE: PROCEDURE UNIVARIATE used (Total process time):
      real time           0.17 seconds
      user cpu time       0.08 seconds
```

```
      system cpu time     0.01 seconds
      memory              7518.12k
      OS Memory           53252.00k
      Timestamp           09/09/2020 10:44:06 AM
      Step Count                        243  Switch Count  0
      Page Faults                       0
      Page Reclaims                     854
      Page Swaps                        0
      Voluntary Context Switches        1201
      Involuntary Context Switches      0
      Block Input Operations            0
      Block Output Operations           536


131
132        /* 2b(i) */
132      !            Data ExpDist;
133        Do i = 1 to 1000;
134        X=-10*log(ranuni(-1));
135        Output;
136        End;
137        Drop i;
138        Run;

NOTE: The data set WORK.EXPDIST has 1000 observations and 1 variables.
NOTE: DATA statement used (Total process time):
      real time           0.00 seconds
      user cpu time       0.01 seconds
      system cpu time     0.00 seconds
      memory              774.78k
      OS Memory           51112.00k
      Timestamp           09/09/2020 10:44:06 AM
      Step Count                        244  Switch Count  2
      Page Faults                       0
      Page Reclaims                     88
      Page Swaps                        0
      Voluntary Context Switches        14
      Involuntary Context Switches      0
      Block Input Operations            0
      Block Output Operations           264


139
140        /* 2b(ii) */
140      !             Proc Means data=ExpDist;
141        Var X;
142        Run;

NOTE: There were 1000 observations read from the data set WORK.EXPDIST.
NOTE: PROCEDURE MEANS used (Total process time):
      real time           0.01 seconds
      user cpu time       0.01 seconds
      system cpu time     0.01 seconds
      memory              6861.90k
      OS Memory           57292.00k
      Timestamp           09/09/2020 10:44:06 AM
      Step Count                        245  Switch Count  1
      Page Faults                       0
      Page Reclaims                     1607
      Page Swaps                        0
      Voluntary Context Switches        19
      Involuntary Context Switches      0
      Block Input Operations            0
      Block Output Operations           8


142      !      * The standard deviation appears to be very close to the mean. This is consistent with the properties of the
142      ! exponential distribution. *;
143
144        /* 2b(iii) */
144      !              Proc Univariate data=ExpDist noprint;
145        Hist X /kernel;
146        Run;

NOTE: The normal kernel estimate for c=0.7852 has a bandwidth of 2.2556 and an AMISE of 0.0002.
NOTE: PROCEDURE UNIVARIATE used (Total process time):
      real time           0.15 seconds
      user cpu time       0.07 seconds
      system cpu time     0.01 seconds
      memory              7412.34k
      OS Memory           53252.00k
      Timestamp           09/09/2020 10:44:06 AM
      Step Count                        246  Switch Count  0
      Page Faults                       0
      Page Reclaims                     758
      Page Swaps                        0
      Voluntary Context Switches        730
      Involuntary Context Switches      0
      Block Input Operations            0
      Block Output Operations           440


147
148        OPTIONS NONOTES NOSTIMER NOSOURCE NOSYNTAXCHECK;
159
```

Results: Program 1.sas

The MEANS Procedure

Analysis Variable : WindChill				
N	Mean	Std Dev	Minimum	Maximum
59	15.6082400	15.5835725	-40.4256072	42.2925234



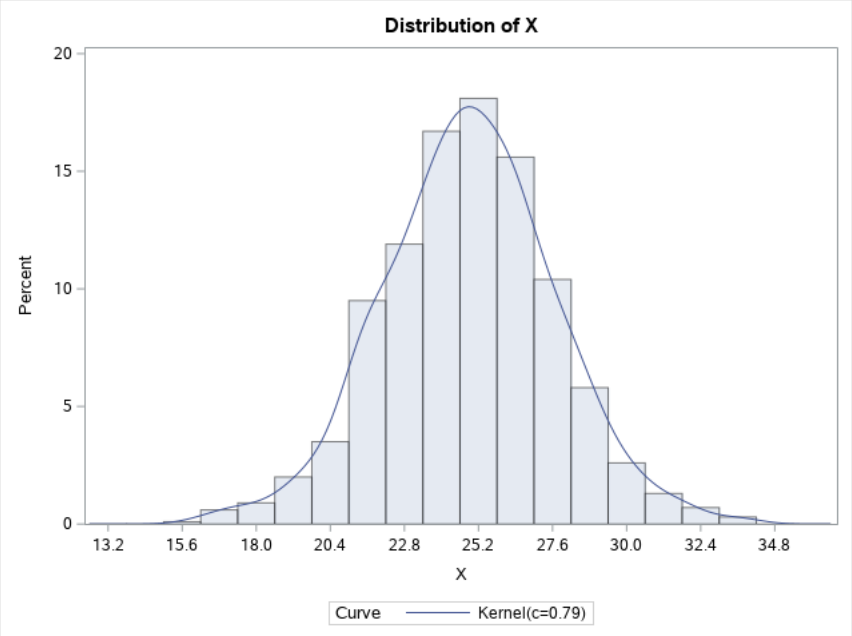
Obs	Date	WindChill
1	01/30/2019	-40.4256
2	01/31/2019	-19.6222
3	01/29/2019	-15.9907
4	01/25/2019	-12.6215
5	02/08/2019	-8.1553
6	01/27/2019	-6.7351
7	01/20/2019	-3.5727
8	01/26/2019	-3.5643
9	01/21/2019	-0.3274
10	01/24/2019	0.1532
11	02/01/2019	2.6801
12	02/25/2019	4.8713
13	02/15/2019	5.4647
14	02/13/2019	7.1540
15	01/09/2019	7.7862
16	02/09/2019	8.2210
17	01/28/2019	9.1146
18	02/26/2019	10.6529
19	01/19/2019	11.7422
20	01/10/2019	13.5155
21	02/16/2019	14.6089
22	02/28/2019	15.8002
23	01/14/2019	15.9562
24	02/24/2019	16.3217
25	02/27/2019	16.3921
26	01/15/2019	17.7107
27	02/18/2019	17.9324
28	01/22/2019	17.9338
29	02/17/2019	17.9338
30	02/19/2019	19.9501
31	02/12/2019	19.9674
32	02/10/2019	20.0554
33	01/13/2019	20.0629
34	01/23/2019	20.7743
35	01/18/2019	21.1659
36	02/11/2019	21.3702
37	01/12/2019	21.4706
38	02/21/2019	21.5620
39	01/02/2019	21.9953
40	01/11/2019	22.1706
41	02/20/2019	22.5388
42	01/01/2019	22.9990
43	02/05/2019	23.2122
44	01/03/2019	23.9880

Obs	Date	WindChill
45	02/07/2019	24.0606
46	01/16/2019	24.9381
47	02/22/2019	25.1325
48	02/02/2019	25.5552
49	01/17/2019	27.5743
50	02/06/2019	29.1586
51	01/08/2019	32.2637
52	02/23/2019	32.4566
53	01/06/2019	32.5306
54	02/14/2019	32.5825
55	01/04/2019	33.3090
56	01/05/2019	36.5793
57	02/03/2019	38.4149
58	02/04/2019	39.8245
59	01/07/2019	42.2925

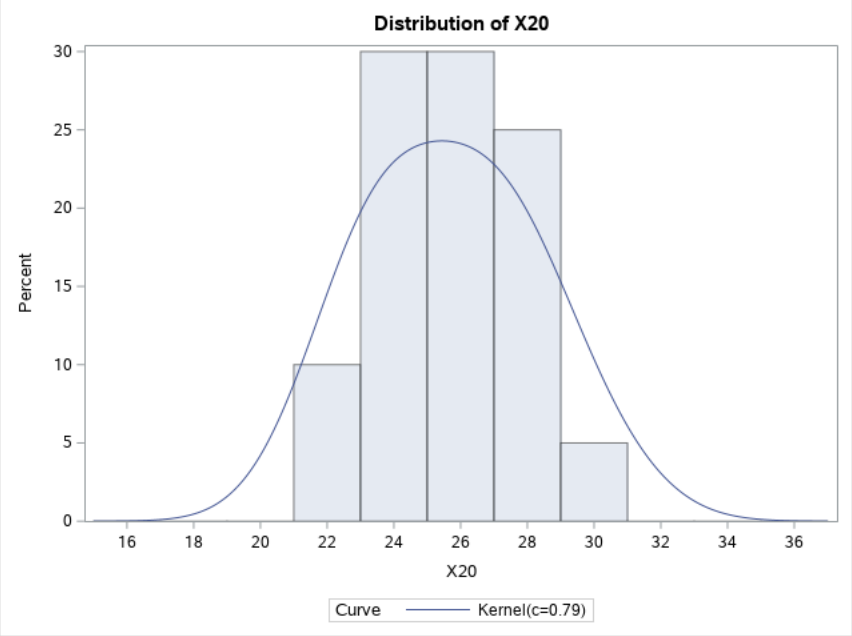
The MEANS Procedure

Analysis Variable : X				
N	Mean	Std Dev	Minimum	Maximum
1000	24.8880887	2.7776962	15.9624262	33.7744059

The UNIVARIATE Procedure



The UNIVARIATE Procedure



The MEANS Procedure

Analysis Variable : X				
N	Mean	Std Dev	Minimum	Maximum
1000	10.3990866	10.1989868	0.0254374	63.9115236

The UNIVARIATE Procedure