

```
* Homework 3;
options nocenter nonumber nodate;
libname in 'c:\bio113\data';

*** create new PERMANENT data set ***;
data in.ivh2; set in.ivh1;

plurality=mod(id,10); *** mod function returns remainder after id divided by 10 ***;

if . < ga < 26 then gacat=1;
else if 26 <= ga <= 28 then gacat=2;
else if ga > 28 then gacat=3;

array A1(4) cc1-cc4;
array A2(3) ccdif1-ccdif3;
array B1(4) pctwt1-pctwt4;
array B2(3) wtdif1-wtdif3;

do i=1 to 3;
  A2(i)=A1(i)- A1(i+1);
  B2(i)=B1(i+1)-B1(i);
end;

drop i;

/* *****
this is the longer but easier way--avoids subscripts

array A1 cc1-cc3;
array A2 cc2-cc4;
array A3 ccdif1-ccdif3;
array B1 pctwt1-pctwt4;
array B2 pctwt2-pctwt4;
array B3 wtdif1-wtdif3;

do over A1; *** implicit subscripts, 3 vars/array ***;
  A3=A1-A2;
  B3=B2-B1;
end;
***** */
run;

proc format;
  value gacat 1='< 26 wk' 2='26-28 wk' 3='> 28 wk';
  value ny 0='No' 1='Yes';
  value sex 0='F' 1='M';
  value hosp 1='St Elsewhere' 2='Chicago Hope';
  value vent 1='None' 2='CPAP' 3='Mechan';
  value acs 1='None' 2='Partial' 3='Complete';
  value ivh 0='.' 1='+';
  value plural 1='Singleton' 2='Twin' 3='Triplet';
run;

proc sort; by gacat; run;

proc means mean min max n t probt maxdec=2; by gacat; where gacat > .;
  var ccdif1-ccdif3 wtdif1-wtdif3;
  format gacat gacat.;
  title 'Homework 3--means';
run;

proc sort; by plurality; run;
```

```

proc means mean min max n maxdec=1; by plurality;
  var bw t4 apgrat pco2_low pco2_hi;
  format plurality plural.;
run;

proc freq;
  tables pih*hosp*acs / cmh;
  format pih ny. hosp hosp. acs acs.;
  label pih='Pregnancy induced hypertension' hosp='Birth hospital'
        acs='Antenatal corticosteroid';
  title 'Homework 3--tables and plots';
  footnote;
run;

options ls=85 ps=60;
proc plot;
  plot fluid2*pctwt2 / href=0;
  label fluid2='Fluids on day 2'
        pctwt2='Percent weight change on day 2';
run;

proc plot;
  plot los*bw=ivh;
  format ivh ivh.;
  label los='Length of stay' bw='Birth weight';
run;

*** create TEMPORARY dataset--unit of obs is "BABY-DAY" ***;
options ls=96 ps=55; * return to "default" page dimension;
data one; set in.ivh2 (keep=wt1-wt4 map1-map4 pco2_1-pco2_4);
keep wt map pco2 day;
array WW(4) wt1-wt4;
array MM(4) map1-map4;
array PP(4) pco2_1-pco2_4;
do day=1 to 4;
  wt=WW(day);
  map=MM(day);
  pco2=PP(day);
  output;
end;

run;

proc sort; by day; run;

proc means maxdec=1; by day;
  var wt map pco2;
  title 'Homework 3--baby-day temporary data set';
run;

data one; set in.ivh2 (keep=id apg1 ivh cs sex ga bw acs labor los); *** TEMP data set ***;
if . < apg1 < 2 and ivh=1;      *** SUBSETTING IF      ***;

proc sort; by cs ga bw; run;

proc print label; by cs; id id;
  var sex ga bw acs labor los;
  sum los;
  label cs='Caesarian delivery' ga='Gestational age'
        bw='Birth weight' los='Length of stay'
        acs='Antenatal corticosteroid' labor='Duration of labor';
  format cs ny. sex sex. acs acs.;
  title 'Babies with 1 minute Apgar < 2 and IVH';

```

```
    footnote 'DEN Study Data';
run;
```

```
1  * Homework 3;
2  options nocenter nonumber nodate;
3  libname in 'c:\bio113\data';
NOTE: Libref IN was successfully assigned as follows:
      Engine:          V8
      Physical Name: c:\bio113\data
4
5  *** create new PERMANENT data set          ***;
6  data in.ivh2; set in.ivh1;
7
8  plurality=mod(id,10); *** mod function returns remainder after id divided by 10 ***;
9
10 if . < ga < 26 then gacat=1;
11 else if 26 <= ga <= 28 then gacat=2;
12 else if ga > 28 then gacat=3;
13
14 array A1(4) cc1-cc4;
15 array A2(3) ccdif1-ccdif3;
16 array B1(4) pctwt1-pctwt4;
17 array B2(3) wtdif1-wtdif3;
18
19 do i=1 to 3;
20     A2(i)=A1(i) - A1(i+1);
21     B2(i)=B1(i+1) - B1(i);
22 end;
23
24 drop i;
25
26 /* *****
27 this is the longer but easier way--avoids subscripts
28
29 array A1 cc1-cc3;
30 array A2 cc2-cc4;
31 array A3 ccdif1-ccdif3;
32 array B1 pctwt1-pctwt4;
33 array B2 pctwt2-pctwt4;
34 array B3 wtdif1-wtdif3;
35
36
37 do over A1; *** implicit subscripts, 3 vars/array ***;
38     A3=A1-A2;
39     B3=B2-B1;
40 end;
41 ***** */
42 run;
```

NOTE: Missing values were generated as a result of performing an operation on missing values.
Each place is given by: (Number of times) at (Line):(Column).

294 at 20:14 289 at 21:16

NOTE: There were 566 observations read from the data set IN.IVH1.

NOTE: The data set IN.IVH2 has 566 observations and 88 variables.

NOTE: DATA statement used:

real time 0.59 seconds

cpu time 0.03 seconds

```
43
44 proc format;
45     value gacat 1='< 26 wk' 2='26-28 wk' 3='> 28 wk';
NOTE: Format GACAT has been output.
46     value ny 0='No' 1='Yes';
```

NOTE: Format NY has been output.

```
47     value sex 0='F' 1='M';
```

NOTE: Format SEX has been output.

```
48     value hosp 1='St Elsewhere' 2='Chicago Hope';
```

NOTE: Format HOSP has been output.

```
49     value vent 1='None' 2='CPAP' 3='Mechan';
```

NOTE: Format VENT has been output.

```
50     value acs 1='None' 2='Partial' 3='Complete';
```

NOTE: Format ACS has been output.

```
51     value ivh 0='.' 1='+';
```

NOTE: Format IVH has been output.

```
52     value plural 1='Singleton' 2='Twin' 3='Triplet';
```

NOTE: Format PLURAL has been output.

```
53     run;
```

NOTE: PROCEDURE FORMAT used:

```
real time          0.15 seconds
```

```
cpu time           0.00 seconds
```

```
54
```

```
55     proc sort; by gacat; run;
```

NOTE: There were 566 observations read from the data set IN.IVH2.

NOTE: The data set IN.IVH2 has 566 observations and 88 variables.

NOTE: PROCEDURE SORT used:

```
real time          0.06 seconds
```

```
cpu time           0.01 seconds
```

```
56
```

```
57     proc means mean min max n t probt maxdec=2; by gacat; where gacat > .;
```

```
58     var ccdif1-ccdif3 wtdif1-wtdif3;
```

```
59     format gacat gacat.;
```

```
60     title 'Homework 3--means';
```

```
61     run;
```

NOTE: There were 564 observations read from the data set IN.IVH2.

```
WHERE gacat>.
```

NOTE: PROCEDURE MEANS used:

```
real time          0.35 seconds
```

```
cpu time           0.00 seconds
```

```
62
```

```
63     proc sort; by plurality; run;
```

NOTE: There were 566 observations read from the data set IN.IVH2.

NOTE: The data set IN.IVH2 has 566 observations and 88 variables.

NOTE: PROCEDURE SORT used:

```
real time          0.01 seconds
```

```
cpu time           0.00 seconds
```

```
64
```

```
65     proc means mean min max n maxdec=1; by plurality;
```

```
66     var bw t4 apgrat pco2_low pco2_hi;
```

```
67     format plurality plural.;
```

```
68     run;
```

NOTE: There were 566 observations read from the data set IN.IVH2.

NOTE: PROCEDURE MEANS used:

```
real time          0.04 seconds
```

```
cpu time           0.01 seconds
```

```
69
```

```

70  proc freq;
71      tables pih*hosp*acs / cmh;
72      format pih ny. hosp hosp. acs acs.;
73      label pih='Pregnancy induced hypertension' hosp='Birth hospital'
74          acs='Antenatal corticosteroid';
75      title 'Homework 3--tables and plots';
76      footnote;
77  run;

```

NOTE: There were 566 observations read from the data set IN.IVH2.

NOTE: PROCEDURE FREQ used:

```

      real time          0.15 seconds
      cpu time           0.00 seconds

```

```

78
79  options ls=85 ps=60;
80  proc plot;
81      plot fluid2*pctwt2 / href=0;
82      label fluid2='Fluids on day 2'
83          pctwt2='Percent weight change on day 2';
84  run;

```

85

NOTE: There were 566 observations read from the data set IN.IVH2.

NOTE: PROCEDURE PLOT used:

```

      real time          0.03 seconds
      cpu time           0.01 seconds

```

```

86  proc plot;
87      plot los*bw=ivh;
88      format ivh ivh.;
89      label los='Length of stay' bw='Birth weight';
90  run;

```

91

```

92  *** create TEMPORARY dataset--unit of obs is "BABY-DAY" ***;
93  options ls=96 ps=55; * return to "default" page dimension;

```

NOTE: There were 566 observations read from the data set IN.IVH2.

NOTE: PROCEDURE PLOT used:

```

      real time          0.01 seconds
      cpu time           0.01 seconds

```

```

94  data one; set in.ivh2 (keep=wt1-wt4 map1-map4 pco2_1-pco2_4);
95  keep wt map pco2 day;
96  array WW(4) wt1-wt4;
97  array MM(4) map1-map4;
98  array PP(4) pco2_1-pco2_4;
99  do day=1 to 4;
100      wt=WW(day);
101      map=MM(day);
102      pco2=PP(day);
103      output;
104  end;
105
106  run;

```

NOTE: There were 566 observations read from the data set IN.IVH2.

NOTE: The data set WORK.ONE has 2264 observations and 4 variables.

NOTE: DATA statement used:

```
real time          0.03 seconds
cpu time           0.01 seconds
```

```
107
108 proc sort; by day; run;
```

NOTE: There were 2264 observations read from the data set WORK.ONE.

NOTE: The data set WORK.ONE has 2264 observations and 4 variables.

NOTE: PROCEDURE SORT used:

```
real time          0.01 seconds
cpu time           0.00 seconds
```

```
109
110 proc means maxdec=1; by day;
111     var wt map pco2;
112 title 'Homework 3--baby-day temporary data set';
113 run;
```

NOTE: There were 2264 observations read from the data set WORK.ONE.

NOTE: PROCEDURE MEANS used:

```
real time          0.06 seconds
cpu time           0.01 seconds
```

```
114
115 data one; set in.ivh2 (keep=id apg1 ivh cs sex ga bw acs labor los); *** TEMP data set
***;
116 if . < apg1 < 2 and ivh=1;      *** SUBSETTING IF      ***;
117
```

NOTE: There were 566 observations read from the data set IN.IVH2.

NOTE: The data set WORK.ONE has 22 observations and 10 variables.

NOTE: DATA statement used:

```
real time          0.03 seconds
cpu time           0.01 seconds
```

```
118 proc sort; by cs ga bw; run;
```

NOTE: There were 22 observations read from the data set WORK.ONE.

NOTE: The data set WORK.ONE has 22 observations and 10 variables.

NOTE: PROCEDURE SORT used:

```
real time          0.03 seconds
cpu time           0.01 seconds
```

```
119
120 proc print label; by cs; id id;
121     var sex ga bw acs labor los;
122     sum los;
123     label cs='Caesarian delivery' ga='Gestational age'
124           bw='Birth weight' los='Length of stay'
125           acs='Antenatal corticosteroid' labor='Duration of labor';
126     format cs ny. sex sex. acs acs.;
127     title 'Babies with 1 minute Apgar < 2 and IVH';
128     footnote 'DEN Study Data';
129 run;
```

NOTE: There were 22 observations read from the data set WORK.ONE.

NOTE: PROCEDURE PRINT used:

```
real time          0.03 seconds
cpu time           0.03 seconds
```

Homework 3--means

gacat=< 26 wk

The MEANS Procedure

Variable	Mean	Minimum	Maximum	N	t Value	Pr > t
ccdif1	-52.43	-149.76	37.75	91	-12.13	<.0001
ccdif2	-10.53	-109.49	80.30	84	-2.79	0.0066
ccdif3	9.29	-94.82	77.42	90	3.15	0.0023
wtdif1	3.61	-20.00	16.30	94	5.89	<.0001
wtdif2	3.91	-15.60	19.10	84	6.98	<.0001
wtdif3	0.93	-15.90	12.50	90	2.00	0.0490

gacat=26-28 wk

Variable	Mean	Minimum	Maximum	N	t Value	Pr > t
ccdif1	-35.12	-106.86	67.33	210	-17.47	<.0001
ccdif2	-18.20	-88.36	175.44	189	-8.93	<.0001
ccdif3	-9.49	-159.17	78.84	204	-5.15	<.0001
wtdif1	3.83	-12.40	19.90	211	10.83	<.0001
wtdif2	4.16	-15.70	24.30	190	12.38	<.0001
wtdif3	1.58	-18.20	14.50	205	5.54	<.0001

gacat=> 28 wk

Variable	Mean	Minimum	Maximum	N	t Value	Pr > t
ccdif1	-33.09	-103.15	59.56	178	-16.54	<.0001
ccdif2	-17.73	-108.31	89.00	172	-10.20	<.0001
ccdif3	-4.57	-100.22	89.98	180	-2.75	0.0066
wtdif1	2.64	-12.70	13.80	178	8.37	<.0001
wtdif2	2.82	-26.90	14.80	172	8.28	<.0001
wtdif3	0.65	-11.70	9.50	179	3.08	0.0024

Homework 3--means

plurality=Singleton

The MEANS Procedure

Variable	Mean	Minimum	Maximum	N
bw	1011.4	500.0	1500.0	486
t4	7.3	0.0	18.0	463
apgrat	0.7	0.0	1.3	480
pco2_low	30.6	6.0	68.0	465
pco2_hi	40.8	19.0	85.0	465

plurality=Twin

Variable	Mean	Minimum	Maximum	N
bw	1047.8	510.0	1495.0	66
t4	6.8	0.1	13.6	63
apgrat	0.7	0.1	1.0	67
pco2_low	31.6	15.0	54.0	62
pco2_hi	41.7	20.0	59.0	62

plurality=Triplet

Variable	Mean	Minimum	Maximum	N
bw	1061.3	640.0	1430.0	12
t4	6.6	2.8	9.9	10
apgrat	0.8	0.3	1.0	12
pco2_low	33.8	25.0	59.0	12
pco2_hi	38.6	25.0	59.0	12

Homework 3--tables and plots

Table 1 of hosp by acs
Controlling for pih=No

hosp(Birth hospital) acs(Antenatal corticosteroid)

Frequency				
Percent				
Row Pct				
Col Pct	None	Partial	Complete	Total
St Elsewhere	115	102	154	371
	24.73	21.94	33.12	79.78
	31.00	27.49	41.51	
	72.78	85.00	82.35	
Chicago Hope	43	18	33	94
	9.25	3.87	7.10	20.22
	45.74	19.15	35.11	
	27.22	15.00	17.65	
Total	158	120	187	465
	33.98	25.81	40.22	100.00

Table 2 of hosp by acs
Controlling for pih=Yes

hosp(Birth hospital) acs(Antenatal corticosteroid)

Frequency				
Percent				
Row Pct				
Col Pct	None	Partial	Complete	Total
St Elsewhere	25	16	34	75
	24.75	15.84	33.66	74.26
	33.33	21.33	45.33	
	64.10	64.00	91.89	
Chicago Hope	14	9	3	26
	13.86	8.91	2.97	25.74
	53.85	34.62	11.54	
	35.90	36.00	8.11	
Total	39	25	37	101
	38.61	24.75	36.63	100.00

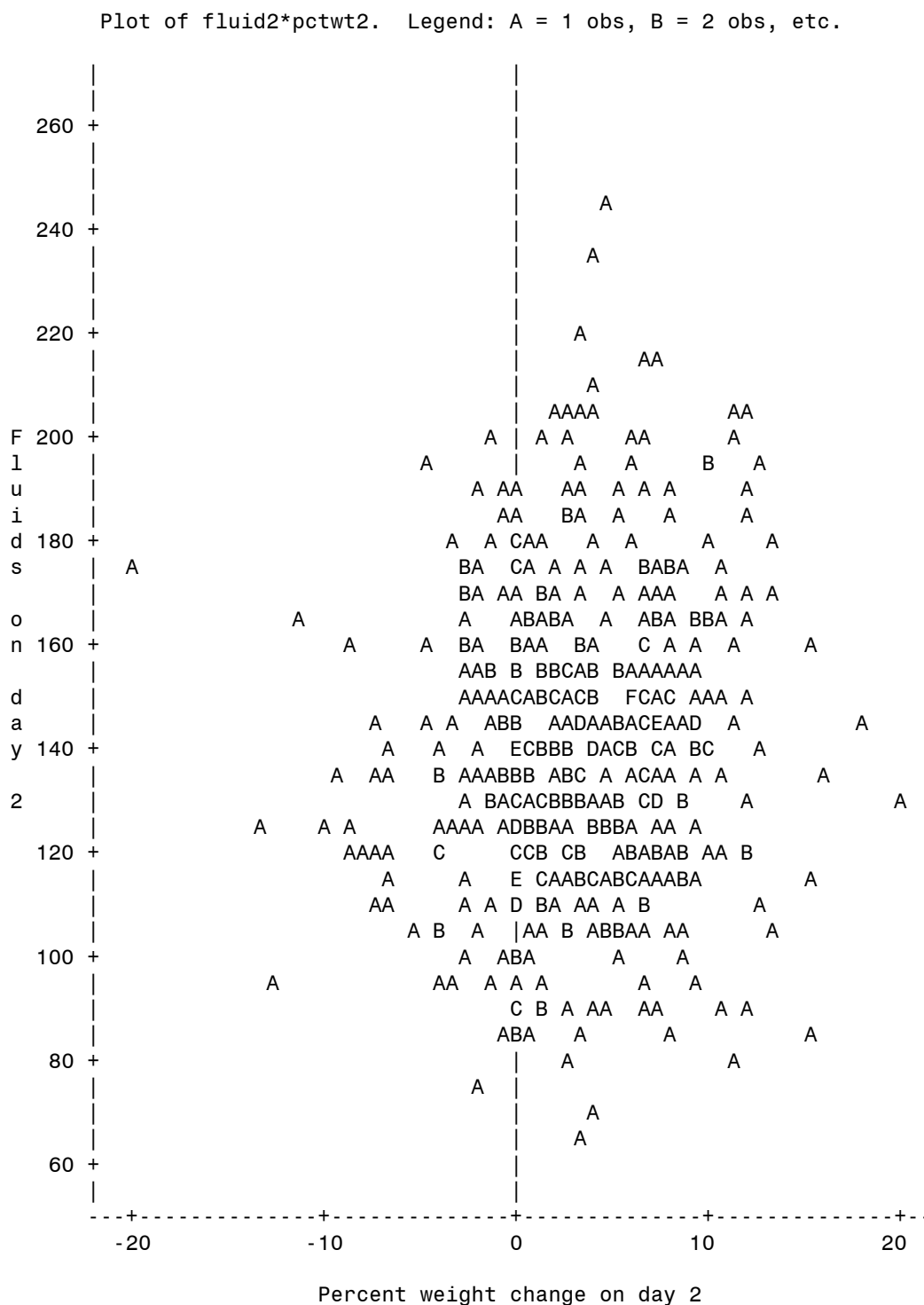
Summary Statistics for hosp by acs
Controlling for pih

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)

Statistic	Alternative Hypothesis	DF	Value	Prob
1	Nonzero Correlation	1	9.8977	0.0017
2	Row Mean Scores Differ	1	9.8977	0.0017
3	General Association	2	10.8369	0.0044

Total Sample Size = 566

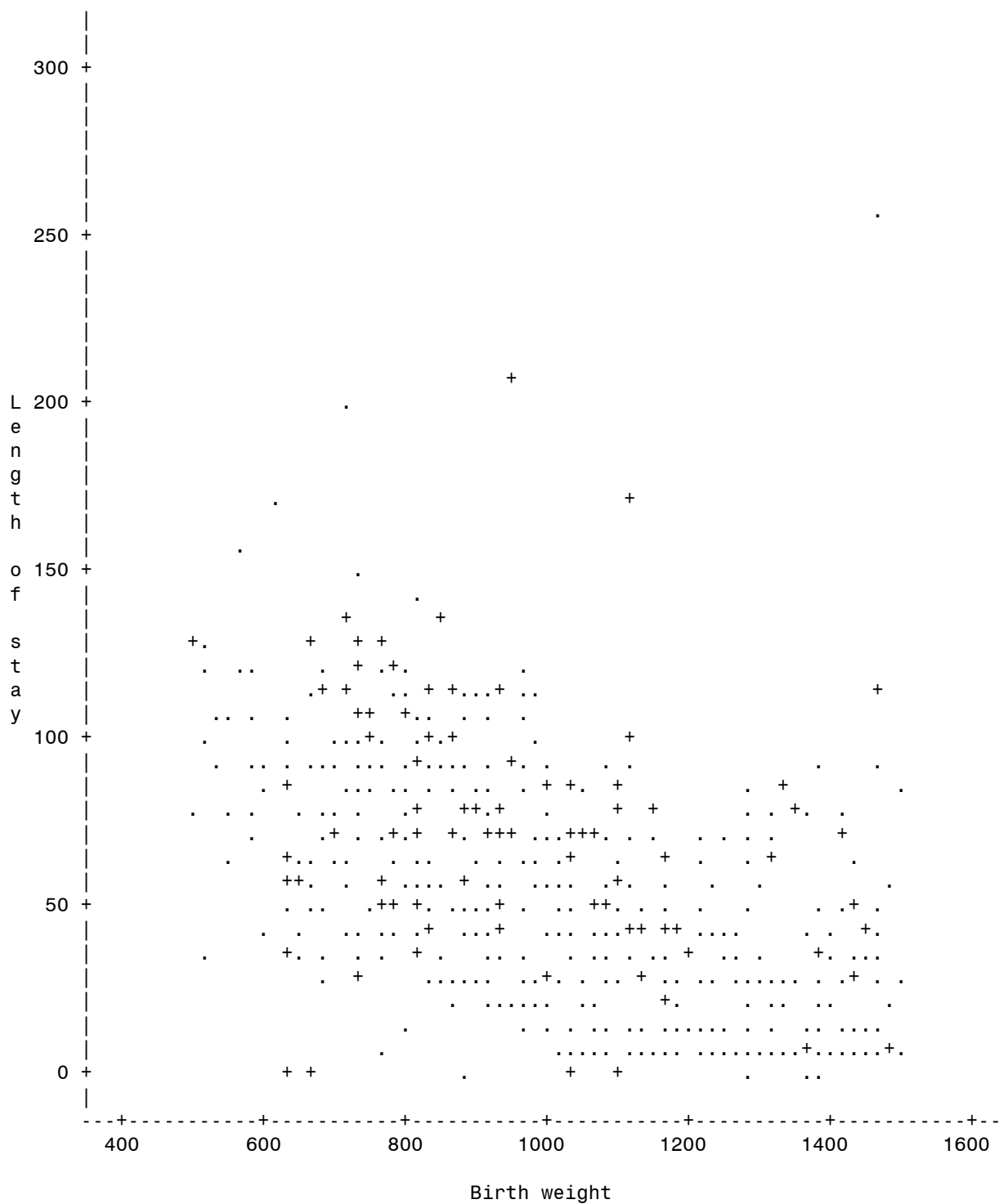
Homework 3--tables and plots



NOTE: 82 obs had missing values.

Homework 3--tables and plots

Plot of $\log(bw)$. Symbol is value of ivh .



NOTE: 2 obs had missing values. 176 obs hidden.

Homework 3--baby-day temporary data set

day=1

The MEANS Procedure

Variable	N	Mean	Std Dev	Minimum	Maximum
wt	565	1017.9	255.4	500.0	1500.0
map	510	33.1	7.6	16.0	74.0
pco2	535	32.7	9.3	6.0	68.0

day=2

Variable	N	Mean	Std Dev	Minimum	Maximum
wt	487	995.4	254.0	425.0	1580.0
map	443	41.0	8.5	19.0	76.0
pco2	398	36.3	7.8	15.0	64.0

day=3

Variable	N	Mean	Std Dev	Minimum	Maximum
wt	496	964.9	248.7	425.0	1520.0
map	424	43.8	9.3	16.0	70.0
pco2	364	36.4	7.8	12.0	70.0

day=4

Variable	N	Mean	Std Dev	Minimum	Maximum
wt	519	944.4	245.0	435.0	1540.0
map	380	45.4	10.0	26.0	71.0
pco2	327	37.8	7.8	18.0	85.0

Babies with 1 minute Apgar < 2 and IVH

Caesarian delivery=No

id	sex	Gestational age	Birth weight	Antenatal corticosteroid	Duration of labor	Length of stay
137062	F	24	680	Complete	47.7	111
220391	M	24	784	None	1.0	87
112341	M	24	810	Complete	9.0	74
136711	M	25	730	None	5.7	110
210811	M	25	861	Partial	.	98
112291	M	26	810	Partial	9.0	58
137252	M	27	1093	None	7.9	80
210121	F	30	830	None	2.0	117
111641	M	30	1470	Partial	21.1	112
-----						-----
cs						847

Caesarian delivery=Yes

id	sex	Gestational age	Birth weight	Antenatal corticosteroid	Duration of labor	Length of stay
220561	F	24	930	None	0.0	44
135431	F	25	650	Complete	1.2	54
124861	M	25	950	None	0.0	206
124021	F	26	630	Complete	13.0	33
210891	F	26	683	None	.	122
124471	M	26	880	Complete	0.0	0
210061	F	26	943	None	.	72
135121	M	26	953	None	0.8	91
137201	M	27	940	None	0.0	73
112351	M	27	1200	None	0.0	37
110971	F	28	1180	Complete	53.0	43
136971	M	28	1330	None	4.0	87
112431	M	30	1100	None	14.0	67
-----						-----
cs						929
						=====
						1776

DEN Study Data