CHAPTER 8

Question2

Run the program here to create a temporary SAS data set (MonthSales):
data monthsales;
input month sales @@;
/* add your line(s) here */
datalines;
1 4000 2 5000 3 . 4 5500 5 5000 6 6000 7 6500 8 4500
9 5100 10 5700 11 6500 12 7500
;
Modify this program so that a new variable, SumSales, representing Sales to date, is added to the
data set. Be sure that the missing value for Sales in month 3 does not result in a missing value for
SumSales.

SAS Code

/* Chapter 8 - Problem 2 */
data monthsales;
    input month sales @@;
    /* added lines to the program */
    SumSales + sales; /* adding like this ignores the missing values in sales, SumSales is retained and also initialized to 0 */
    format Sales dollar8.2 SumSales dollar10.2;
datalines;
1 4000 2 5000 3 . 4 5500 5 5000 6 6000 7 6500 8 4500
9 5100 10 5700 11 6500 12 7500
;
run;

proc print data = monthsales noobs;
    title 'Sales to date';
run;
SAS Output

<table>
<thead>
<tr>
<th>month</th>
<th>sales</th>
<th>SumSales</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$4000.00</td>
<td>$4,000.00</td>
</tr>
<tr>
<td>2</td>
<td>$5000.00</td>
<td>$9,000.00</td>
</tr>
<tr>
<td>3</td>
<td>.</td>
<td>$9,000.00</td>
</tr>
<tr>
<td>4</td>
<td>$5500.00</td>
<td>$14,500.00</td>
</tr>
<tr>
<td>5</td>
<td>$5000.00</td>
<td>$19,500.00</td>
</tr>
<tr>
<td>6</td>
<td>$6000.00</td>
<td>$25,500.00</td>
</tr>
<tr>
<td>7</td>
<td>$6500.00</td>
<td>$32,000.00</td>
</tr>
<tr>
<td>8</td>
<td>$4500.00</td>
<td>$36,500.00</td>
</tr>
<tr>
<td>9</td>
<td>$5100.00</td>
<td>$41,600.00</td>
</tr>
<tr>
<td>10</td>
<td>$5700.00</td>
<td>$47,300.00</td>
</tr>
<tr>
<td>11</td>
<td>$6500.00</td>
<td>$53,800.00</td>
</tr>
<tr>
<td>12</td>
<td>$7500.00</td>
<td>$61,300.00</td>
</tr>
</tbody>
</table>

Question 7

Use an iterative DO loop to plot the following equation: \( y = 3x^2 - 5x + 10 \)
Use values of \( x \) from 0 to 10, with an increment of .10. Copy the GPLOT statements from Problem 8 or use PROC PLOT to display the resulting equation.

SAS Code

```sas
/* Chapter 8 - Problem 7 */

data eqnplot;
    do x = 1 to 10 by .1;
        y = 3*x**2 - 5*x + 10;
        output;
    end;
run;
goptions reset=all
    ftext='arial'
    htext=1.0
    ftitle='arial/bo'
    htitle=1.5
    colors=(black);
    symbol v=none i=sm;
proc gplot data = eqnplot;
    title 'Plot of the equation y = 3 * x^2 - 5*x + 10';
    plot y * x;
run;
quit;
```
SAS Output

Plot of the equation $y = 3 \cdot x^2 - 5x + 10$

Question 8

Use an iterative DO loop to plot the following equation: \( \text{Logit} = \log\left(\frac{p}{1 - p}\right) \)
Use values of \( p \) from 0 to 1 (with a point at every .05).

SAS Code

```sas
/* Chapter 8 - Problem 8 */

data logitplot;
  do p = 0 to 1 by .05;
    logit = log(p / (1 - p));
    output;
  end;
run;

goptions reset=all
  ftext='arial'
  htext=1.0
  ftitle='arial/bo'
  htitle=1.5
  colors=(black);
symbol v=none i=sm;
```
```sas
proc gplot data = logitplot;
    
    title 'Logit Plot';
    plot logit * p;

run;
quit;
```

SAS Output

![Logit Plot](image-url)
Question 12

You place money in a fund that returns a compound interest of 4.25% annually. You deposit $1,000 every year. How many years will it take to reach $30,000? Use Do While or Do Until to calculate the number of years.

SAS Code

/* Chapter 8 - Problem 12 */

data years;
    retain year 0; /* initializing the year variable as 0 */
    retain total 0; /* initializing the total variable as 0 */
    deposit = 1000;
    interest = .0425;
    do until (total gt 30000);
        total = (deposit + total) * (1 + interest); /* calculating the compound interest */
        year = year + 1;
        output;
    end;
    format total dollar10.2 deposit dollar8.2;
run;

proc print data = years noobs;
    title 'DO Until Statement to calculate the Compound Interest';
    var interest deposit total year;
run;

SAS Output

DO Until Statement to calculate the Compound Interest 20
22:29 Thursday, April 30, 2009

interest  deposit  total  year
0.0425    $1000.00  $1,042.50  1
0.0425    $1000.00  $2,129.31  2
0.0425    $1000.00  $3,262.30  3
0.0425    $1000.00  $4,443.45  4
0.0425    $1000.00  $5,674.80  5
0.0425    $1000.00  $6,958.48  6
0.0425    $1000.00  $8,296.71  7
0.0425    $1000.00  $9,691.82  8
0.0425    $1000.00  $11,146.22 9
0.0425    $1000.00  $12,662.44 10
0.0425    $1000.00  $14,243.09 11
0.0425    $1000.00  $15,890.92 12
0.0425    $1000.00  $17,608.79 13
0.0425    $1000.00  $19,399.66 14
Therefore, 20 years will be required for the initial deposit to reach $30,000 when the compound interest is 4.25% annually and the deposit of $1,000 is made every year.

CHAPTER 9

Question 8

Using the values for Day, Month, and Year in the raw data below, create a temporary SAS data set containing a SAS date based on these values (call it Date) and format this value using the MMDDYY10. format. Here are the Day, Month, and Year values:

25 12 2005
1 1 1960
21 10 1946

SAS Code

/* Chapter 9 - Problem 8 */

data date_08;
  input day month year;
  date = mdy(month , day, year); /* function mdy to create the desired date */
  format date mmddyy10.;

datalines;
25 12 2005
1 1 1960
21 10 1946;
run;
quit;

proc print data = date_08 noobs;
  title 'Date created from the values for Problem 8';
run;

SAS Output

Date created from the values for Problem 8                  21
22:29 Thursday, April 30, 2009

day    month    year          date
25      12     2005    12/25/2005
1       1     1960    01/01/1960
21      10     1946    10/21/1946
Question 9

Repeat Problem 8, except use the following data. If there is a missing value for the day, substitute the 15th of the month.

25 12 2005
. 5 2002
12 8 2006

SAS Code

/* Chapter 9 - Problem 9 */
data date_09;
   input day month year;
   if missing(day) then date = mdy(month, 15, year); /* substituting 15 for the missing date */
   else date = mdy(month, day, year);
   format date mmddyy10.;
datalines;
25 12 2005
. 5 2002
12 8 2006
;
run;
proc print data = date_09 noobs;
   title 'Date created from the values for Problem 9';
run;

SAS Output

Date created from the values for Problem 9                  22
22:29 Thursday, April 30, 2009

  day    month    year          date
    25      12     2005    12/25/2005
     .       5     2002    05/15/2002
    12       8     2006    08/12/2006
SAS Code used in Homework 3

CHAPTER 8

/* Chapter 8 - Problem 2 */

data monthsales;
  input month sales @@;
  SumSales + sales; /* added lines to the program */
  SumSales is retained and initialized at 0 */
  format Sales dollar8.2 SumSales dollar10.2;

datalines;
  1 4000 2 5000 3 . 4 5500 5 5000 6 6000 7 6500 8 4500 9 5100 10 5700 11 6500 12 7500
; run;
title 'Sales to date';
proc print data = monthsales noobs;
run;

/* Chapter 8 - Problem 7 */

data eqnplot;
  do x = 1 to 10 by .1;
    y = 3*x**2 - 5*x + 10;
  output;
  end;
run;
goptions reset=all
  ftext='arial'
  htext=1.0
  ftitle='arial/bo'
  htitle=1.5
  colors=(black);
  symbol v=none i=sm;
proc gplot data = eqnplot;
  title 'Plot of the equation y = 3 * x^2 - 5*x + 10';
  plot y * x;
run;
quit;

/* Chapter 8 - Problem 8 */

data logitplot;
  do p = 0 to 1 by .05;
    logit = log(p / ( 1 - p));
    *if not missing (logit) then output;
  output;
  end;
run;
goptions reset=all
   ftext='arial'
   htext=1.0
   ftitle='arial/bo'
   htitle=1.5
   colors=(black);
   symbol v=none i=sm;

proc gplot data = logitplot;
   title 'Logit Plot';
   plot logit * p;
run;
quit;

/* Chapter 8 - Problem 12 */
data years;
   retain year 0; /* inializing the year variable as 0 */
   retain total 0; /* initalizing the total variable as 0 */
   deposit = 1000;
   interest = .0425;
   do until (total gt 30000);
      total = (deposit + total) * (1 + interest); /* calculating the compound interest */
      year = year + 1;
      output;
   end;
format total dollar10.2 deposit dollar8.2;
run;

proc print data = years noobs;
   title 'DO Until Statement to calculate the Compound Interest';
   var interest deposit total year;
run;
CHAPTER 9

/* Chapter 9 - Problem 8 */
data date_08;
   input day month year;
   date = mdy(month, day, year); /* function mdy to create the desired date */
format date mmddyy10.;
datalines;
25 12 2005
1 1 1960
21 10 1946;
run;
quit;

proc print data = date_08 noobs;
   title 'Date created from the values for Problem 8';
run;

/* Chapter 9 - Problem 9 */
data date_09;
   input day month year;
   date = mdy(month, day, year);
   if missing(day) then date = mdy(month, 15, year); /* substituting 15 for the missing date */
   else date = mdy(month, day, year);
format date mmddyy10.;
datalines;
25 12 2005
. 5 2002
12 8 2006;
run;
proc print data = date_09 noobs;
   title 'Date created from the values for Problem 9';
run;

Chapter 10

1.
SAS Code:

libname data 'C:\books\learning';

data Subset_A Subset_B;
   set Data.Blood;
Combined = .001 * WBC + RBC;
if Gender = 'Female' and BloodType = 'AB' then do;
   output Subset_A;
   if Combined ge 14
      then output Subset_B;
end;
run;

Output:

Subset_A

<table>
<thead>
<tr>
<th>Obs</th>
<th>Gender</th>
<th>Type</th>
<th>Group</th>
<th>Subject</th>
<th>WBC</th>
<th>RBC</th>
<th>Chol</th>
<th>Combined</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Female</td>
<td>AB</td>
<td>Young</td>
<td>1</td>
<td>7710</td>
<td>7.40</td>
<td>258</td>
<td>15.11</td>
</tr>
<tr>
<td>2</td>
<td>Female</td>
<td>AB</td>
<td>Old</td>
<td>25</td>
<td>7480</td>
<td>4.70</td>
<td>183</td>
<td>12.18</td>
</tr>
<tr>
<td>3</td>
<td>Female</td>
<td>AB</td>
<td>Young</td>
<td>78</td>
<td>7410</td>
<td>5.82</td>
<td>175</td>
<td>13.23</td>
</tr>
<tr>
<td>4</td>
<td>Female</td>
<td>AB</td>
<td>Young</td>
<td>79</td>
<td>.</td>
<td>4.61</td>
<td>69</td>
<td>.</td>
</tr>
<tr>
<td>5</td>
<td>Female</td>
<td>AB</td>
<td>Young</td>
<td>101</td>
<td>7610</td>
<td>4.60</td>
<td>162</td>
<td>12.21</td>
</tr>
<tr>
<td>6</td>
<td>Female</td>
<td>AB</td>
<td>Old</td>
<td>142</td>
<td>9380</td>
<td>5.82</td>
<td>218</td>
<td>15.20</td>
</tr>
<tr>
<td>7</td>
<td>Female</td>
<td>AB</td>
<td>Young</td>
<td>180</td>
<td>6220</td>
<td>5.58</td>
<td>.</td>
<td>11.80</td>
</tr>
<tr>
<td>8</td>
<td>Female</td>
<td>AB</td>
<td>Old</td>
<td>199</td>
<td>6810</td>
<td>5.54</td>
<td>.</td>
<td>12.35</td>
</tr>
<tr>
<td>9</td>
<td>Female</td>
<td>AB</td>
<td>Old</td>
<td>255</td>
<td>8080</td>
<td>5.45</td>
<td>144</td>
<td>13.53</td>
</tr>
<tr>
<td>10</td>
<td>Female</td>
<td>AB</td>
<td>Young</td>
<td>260</td>
<td>7680</td>
<td>.</td>
<td>127</td>
<td>.</td>
</tr>
<tr>
<td>11</td>
<td>Female</td>
<td>AB</td>
<td>Young</td>
<td>288</td>
<td>6810</td>
<td>8.26</td>
<td>138</td>
<td>15.07</td>
</tr>
<tr>
<td>12</td>
<td>Female</td>
<td>AB</td>
<td>Young</td>
<td>363</td>
<td>7950</td>
<td>5.24</td>
<td>.</td>
<td>13.19</td>
</tr>
<tr>
<td>13</td>
<td>Female</td>
<td>AB</td>
<td>Old</td>
<td>366</td>
<td>7350</td>
<td>4.72</td>
<td>135</td>
<td>12.07</td>
</tr>
<tr>
<td>14</td>
<td>Female</td>
<td>AB</td>
<td>Old</td>
<td>414</td>
<td>.</td>
<td>5.98</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>15</td>
<td>Female</td>
<td>AB</td>
<td>Old</td>
<td>449</td>
<td>7480</td>
<td>3.37</td>
<td>186</td>
<td>10.85</td>
</tr>
<tr>
<td>16</td>
<td>Female</td>
<td>AB</td>
<td>Young</td>
<td>459</td>
<td>6620</td>
<td>6.19</td>
<td>184</td>
<td>12.81</td>
</tr>
<tr>
<td>17</td>
<td>Female</td>
<td>AB</td>
<td>Old</td>
<td>528</td>
<td>6310</td>
<td>6.30</td>
<td>.</td>
<td>12.61</td>
</tr>
<tr>
<td>18</td>
<td>Female</td>
<td>AB</td>
<td>Old</td>
<td>544</td>
<td>6360</td>
<td>4.88</td>
<td>.</td>
<td>11.24</td>
</tr>
<tr>
<td>19</td>
<td>Female</td>
<td>AB</td>
<td>Old</td>
<td>652</td>
<td>9110</td>
<td>5.41</td>
<td>.</td>
<td>14.52</td>
</tr>
<tr>
<td>20</td>
<td>Female</td>
<td>AB</td>
<td>Old</td>
<td>802</td>
<td>7200</td>
<td>3.37</td>
<td>185</td>
<td>10.57</td>
</tr>
</tbody>
</table>
2. SAS Code:

```sas
data Monday2002;
  set Data.Hosp;
  Age = round(yrdif(DOB,AdmitDate,'Actual'));
  if weekday(AdmitDate) = 2 and year(AdmitDate) = 2002 then output;
run;
proc sort data = Monday2002;
  by AdmitDate;
run;
```

Output:

<table>
<thead>
<tr>
<th>Obs</th>
<th>AdmitDate</th>
<th>quarter</th>
<th>DOB</th>
<th>DischrDate</th>
<th>Subject</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>06/10/2002</td>
<td>1</td>
<td>08/27/1971</td>
<td>06/28/2002</td>
<td>1841</td>
<td>31</td>
</tr>
<tr>
<td>2</td>
<td>06/10/2002</td>
<td>1</td>
<td>08/09/1966</td>
<td>06/17/2002</td>
<td>3784</td>
<td>36</td>
</tr>
<tr>
<td>3</td>
<td>06/10/2002</td>
<td>1</td>
<td>04/20/1932</td>
<td>06/15/2002</td>
<td>6792</td>
<td>70</td>
</tr>
<tr>
<td>4</td>
<td>06/17/2002</td>
<td>1</td>
<td>11/29/1984</td>
<td>06/21/2002</td>
<td>6849</td>
<td>18</td>
</tr>
<tr>
<td>5</td>
<td>06/24/2002</td>
<td>1</td>
<td>11/24/1963</td>
<td>06/24/2002</td>
<td>3669</td>
<td>39</td>
</tr>
<tr>
<td>6</td>
<td>07/08/2002</td>
<td>2</td>
<td>01/10/1941</td>
<td>07/16/2002</td>
<td>3612</td>
<td>61</td>
</tr>
<tr>
<td>63</td>
<td>12/23/2002</td>
<td>3</td>
<td>01/29/1926</td>
<td>12/26/2002</td>
<td>305</td>
<td>77</td>
</tr>
<tr>
<td>64</td>
<td>12/30/2002</td>
<td>3</td>
<td>01/17/1927</td>
<td>01/06/2003</td>
<td>2692</td>
<td>76</td>
</tr>
<tr>
<td>66</td>
<td>12/30/2002</td>
<td>3</td>
<td>08/24/1979</td>
<td>01/07/2003</td>
<td>2694</td>
<td>23</td>
</tr>
</tbody>
</table>
3.

SAS Code:

```sas
data Lowmale Lowfemale;
  set Data.Blood;
  if Gender = 'Male' and Chol lt 100 and not missing(Chol) then output Lowmale;
  else if Gender = 'Female' and Chol lt 100 and not missing(Chol) then output Lowfemale;
run;
```
Output:

<table>
<thead>
<tr>
<th>Gender</th>
<th>Type</th>
<th>Group</th>
<th>Subject</th>
<th>WBC</th>
<th>RBC</th>
<th>Chol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>AB</td>
<td>Old</td>
<td>47</td>
<td>5540</td>
<td>5.27</td>
<td>80</td>
</tr>
<tr>
<td>Male</td>
<td>A</td>
<td>Young</td>
<td>492</td>
<td>.</td>
<td>3.94</td>
<td>36</td>
</tr>
<tr>
<td>Male</td>
<td>A</td>
<td>Old</td>
<td>739</td>
<td>6460</td>
<td>4.99</td>
<td>90</td>
</tr>
<tr>
<td>Male</td>
<td>A</td>
<td>Old</td>
<td>829</td>
<td>7950</td>
<td>.</td>
<td>17</td>
</tr>
<tr>
<td>Male</td>
<td>O</td>
<td>Old</td>
<td>841</td>
<td>.</td>
<td>3.87</td>
<td>65</td>
</tr>
<tr>
<td>Male</td>
<td>O</td>
<td>Old</td>
<td>930</td>
<td>6550</td>
<td>6.07</td>
<td>96</td>
</tr>
<tr>
<td>Male</td>
<td>A</td>
<td>Young</td>
<td>970</td>
<td>6130</td>
<td>5.94</td>
<td>99</td>
</tr>
<tr>
<td>Male</td>
<td>O</td>
<td>Young</td>
<td>987</td>
<td>6020</td>
<td>.</td>
<td>94</td>
</tr>
</tbody>
</table>

Lowfemale

<table>
<thead>
<tr>
<th>Gender</th>
<th>Type</th>
<th>Group</th>
<th>Subject</th>
<th>WBC</th>
<th>RBC</th>
<th>Chol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>AB</td>
<td>Young</td>
<td>79</td>
<td>.</td>
<td>4.61</td>
<td>69</td>
</tr>
<tr>
<td>Female</td>
<td>O</td>
<td>Old</td>
<td>133</td>
<td>8320</td>
<td>4.88</td>
<td>56</td>
</tr>
<tr>
<td>Female</td>
<td>A</td>
<td>Old</td>
<td>426</td>
<td>7220</td>
<td>6.81</td>
<td>97</td>
</tr>
<tr>
<td>Female</td>
<td>B</td>
<td>Old</td>
<td>776</td>
<td>5840</td>
<td>5.42</td>
<td>96</td>
</tr>
</tbody>
</table>

4.

SAS Code:

```sas
data Mountain_USA Road_France;
  set Data.Bicycles;
  if Country = 'USA' and Model = 'Mountain Bike' then output Mountain_USA;
  else if Country = 'France' and Model = 'Road Bike' then output Road_France;
run;
```
Output:

Mountain USA

<table>
<thead>
<tr>
<th>Obs</th>
<th>Country</th>
<th>Model</th>
<th>Manuf</th>
<th>Units</th>
<th>UnitCost</th>
<th>TotalSales</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>USA</td>
<td>Mountain Bike</td>
<td>Trek</td>
<td>6000</td>
<td>$1,200</td>
<td>$7,200</td>
</tr>
<tr>
<td>2</td>
<td>USA</td>
<td>Mountain Bike</td>
<td>Cannondale</td>
<td>4000</td>
<td>$2,700</td>
<td>$10,800</td>
</tr>
</tbody>
</table>

Road France

<table>
<thead>
<tr>
<th>Obs</th>
<th>Country</th>
<th>Model</th>
<th>Manuf</th>
<th>Units</th>
<th>UnitCost</th>
<th>TotalSales</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>France</td>
<td>Road Bike</td>
<td>Trek</td>
<td>3400</td>
<td>$2,500</td>
<td>$8,500</td>
</tr>
<tr>
<td>2</td>
<td>France</td>
<td>Road Bike</td>
<td>Cannondale</td>
<td>900</td>
<td>$3,700</td>
<td>$3,330</td>
</tr>
</tbody>
</table>