CHAPTER 8

Question 2

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

Sales to date 25
22:29 Thursday, April 30, 2009

<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>$36,000.00</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
    fttitle='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 $y = 3 \cdot x^2 - 5 \cdot x + 10$

Question 8

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

SAS Code

/* 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;
**proc gplot data = logitplot;**

    title 'Logit Plot';
    plot logit * p;

**run;**
**quit;**

**SAS Output**
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

<table>
<thead>
<tr>
<th>interest</th>
<th>deposit</th>
<th>total</th>
<th>year</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0425</td>
<td>$1000.00</td>
<td>$1,042.50</td>
<td>1</td>
</tr>
<tr>
<td>0.0425</td>
<td>$1000.00</td>
<td>$2,129.31</td>
<td>2</td>
</tr>
<tr>
<td>0.0425</td>
<td>$1000.00</td>
<td>$3,262.30</td>
<td>3</td>
</tr>
<tr>
<td>0.0425</td>
<td>$1000.00</td>
<td>$4,443.45</td>
<td>4</td>
</tr>
<tr>
<td>0.0425</td>
<td>$1000.00</td>
<td>$5,674.80</td>
<td>5</td>
</tr>
<tr>
<td>0.0425</td>
<td>$1000.00</td>
<td>$6,958.48</td>
<td>6</td>
</tr>
<tr>
<td>0.0425</td>
<td>$1000.00</td>
<td>$8,296.71</td>
<td>7</td>
</tr>
<tr>
<td>0.0425</td>
<td>$1000.00</td>
<td>$9,691.82</td>
<td>8</td>
</tr>
<tr>
<td>0.0425</td>
<td>$1000.00</td>
<td>$11,146.22</td>
<td>9</td>
</tr>
<tr>
<td>0.0425</td>
<td>$1000.00</td>
<td>$12,662.44</td>
<td>10</td>
</tr>
<tr>
<td>0.0425</td>
<td>$1000.00</td>
<td>$14,243.09</td>
<td>11</td>
</tr>
<tr>
<td>0.0425</td>
<td>$1000.00</td>
<td>$15,890.92</td>
<td>12</td>
</tr>
<tr>
<td>0.0425</td>
<td>$1000.00</td>
<td>$17,608.79</td>
<td>13</td>
</tr>
<tr>
<td>0.0425</td>
<td>$1000.00</td>
<td>$19,399.66</td>
<td>14</td>
</tr>
</tbody>
</table>
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**

```sas
/* 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.;

dataines;
  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
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day  month  year  date
25      12     2005    12/25/2005
 1       1     1960    01/01/1960
21      10     1946    10/21/1946
```

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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

<table>
<thead>
<tr>
<th>day</th>
<th>month</th>
<th>year</th>
<th>date</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>12</td>
<td>2005</td>
<td>12/25/2005</td>
</tr>
<tr>
<td>.5</td>
<td>5</td>
<td>2002</td>
<td>05/15/2002</td>
</tr>
<tr>
<td>12</td>
<td>8</td>
<td>2006</td>
<td>08/12/2006</td>
</tr>
</tbody>
</table>
SAS Code used in Homework 3

CHAPTER 8

/* Chapter 8 - Problem 2 */

data monthsales;
  input month sales @@;

  SumSales + sales;

  /* added like ignores the missing values in sales, 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*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; /* 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;
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;