CHAPTER 8

Question 2

Run the program here to create a temporary SAS data set (MonthSales):

```sas
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**

```sas
/* 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>

Question7

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

/* 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
    ftex='arial'
    htex=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 $y = 3 \cdot x^2 - 5 \cdot x + 10$

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

SAS Output

![Logit Plot Graph](image)
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

```sas
/* 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

22:29 Thursday, April 30, 2009

interest  deposit      total       year
          $1000.00 $1,042.50      1
          $1000.00 $2,129.31      2
          $1000.00 $3,262.30      3
          $1000.00 $4,443.45      4
          $1000.00 $5,674.80      5
          $1000.00 $6,958.48      6
          $1000.00 $8,296.71      7
          $1000.00 $9,691.82      8
          $1000.00 $11,146.22     9
          $1000.00 $12,662.44     10
          $1000.00 $14,243.09    11
          $1000.00 $15,890.92    12
          $1000.00 $17,608.79    13
          $1000.00 $19,399.66    14
```

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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 8

/* Chapter 8 - Problem 2 */

```plaintext
data monthsales;
  input month sales @@;
/* added lines to the program */
  SumSales + sales; /* adding 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**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;
```

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/* 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
g   ftex=1.0
g   ftexl=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; /* initialializing the year variable as 0 */
    retain total 0; /* initialializing 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;