SAAM II Version 2.2
Basic Tutorials

Writing Reports

There might be slight variations in the graphical representations and plot options in the latest version 2.2.3. However, navigating through them should be intuitive, as the core principles remain consistent.

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Writing Reports

Prerequisites

The prerequisite for this tutorial is having worked through the **SAAM II** introductory tutorial, "Getting Started with **SAAM II Compartmental**."

What you will learn in this tutorial

The purpose of this tutorial is to show you how to create and save material to prepare reports. You will learn

- How to use the **Notes** window (Part 1)
- How to create and use text files (Part 2)

Files Required

Study Files: The study file for this tutorial is

study_0.stu

This file is included as part of this tutorial. This file is the same as **study_0.stu** that is installed in the **SAAM II** program folder.

SAAMII Version 2.1 Update:

- The export capabilities as well as copy & paste functions have been updated to allow for easier transfer of plots, data and results to other applications. In most menus including Data, Equations, Tables and Values, standard shortcuts such as "Ctrl + c" (copy) and "Ctrl + a" (select all) are available to quickly select, copy and paste information to other applications. "Ctrl + c" (copy) generally selects and copies all data in the window where your cursor rests.
- **Notes Window**: The user is encouraged to take advantage of the **Notes** window to track modeling setup and choices with your saved model. Accurate notes can document your model development and maintain a record with your saved model file.
- **Save Results to Text File**: Several settings are available as explained herein. Setting up the 'page setup' to landscape allows for a clearer view of tabular results in the saved text files. Copy information directly into other applications.

Introduction

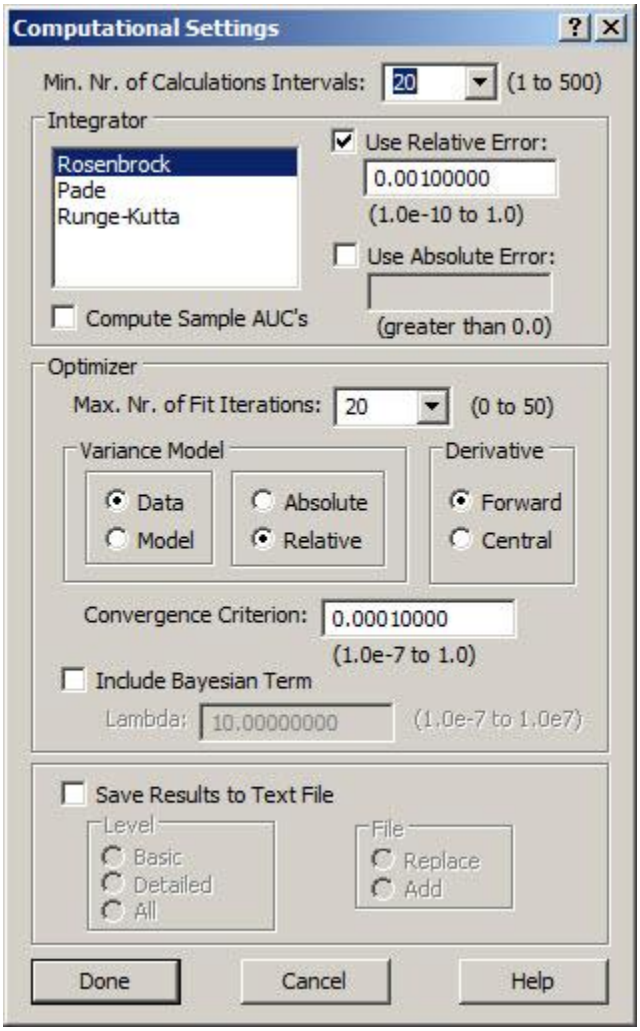
This tutorial focuses on how to create material to prepare a report, and how to copy the material into other applications such as Microsoft Word®. All of the tutorials in the Using SAAM II series have been created using Microsoft Word® and by copying material created during a SAAM II modeling exercise into this application.

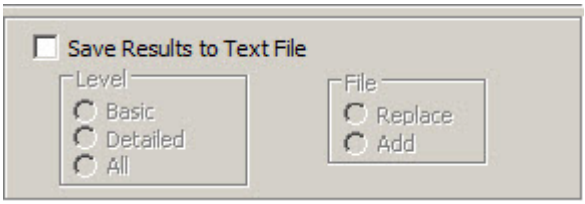
A variety of techniques can be used. One is to copy or export tabular information to a spreadsheet application such as Microsoft Excel® or Microsoft Word®. Another is to use the screen print capability or a software tool which will allow you to capture portions of your computer screen. These can be saved, and then copied into a Microsoft Word® document. All of these were used in creating the Using SAAM II tutorials.

The major options in SAAM II to create and save material for report writing are the **Notes** window, and saving information to a text file.

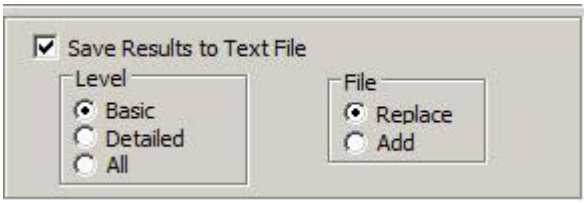
The **Notes** window  is accessed from the **SAAM II Toolbar**. This will be explained in Part 1 of this tutorial.

In the **Compute** menu, select **Settings** to access the **Computational Settings** dialog box. ***Saving information to a text file*** is set up in the **Computational Settings** dialog box shown below:





You can see the **Save Results to Text File** check box. When this box is selected, the options will appear as follows:



There are three levels of information that can be saved, **Basic**, **Detailed** and **All**; each will be illustrated in Part 2. In terms of creating the text file, you can **Replace** the existing saved file or **Add** to it. These options will also be explained in Part 2.

Part 1. Using the Notes Window

The **Notes** window can be used to create and retain information of interest for a given model, such as a description of what is being modeled, comments on certain aspects of the model, a description of sampling techniques, etc. The **Notes** window is a standard text window and accepts normal editing. The contents of the **Notes** window are automatically saved with the model when you save the model. The **Notes** window may be left open while you are working on other parts of the model.

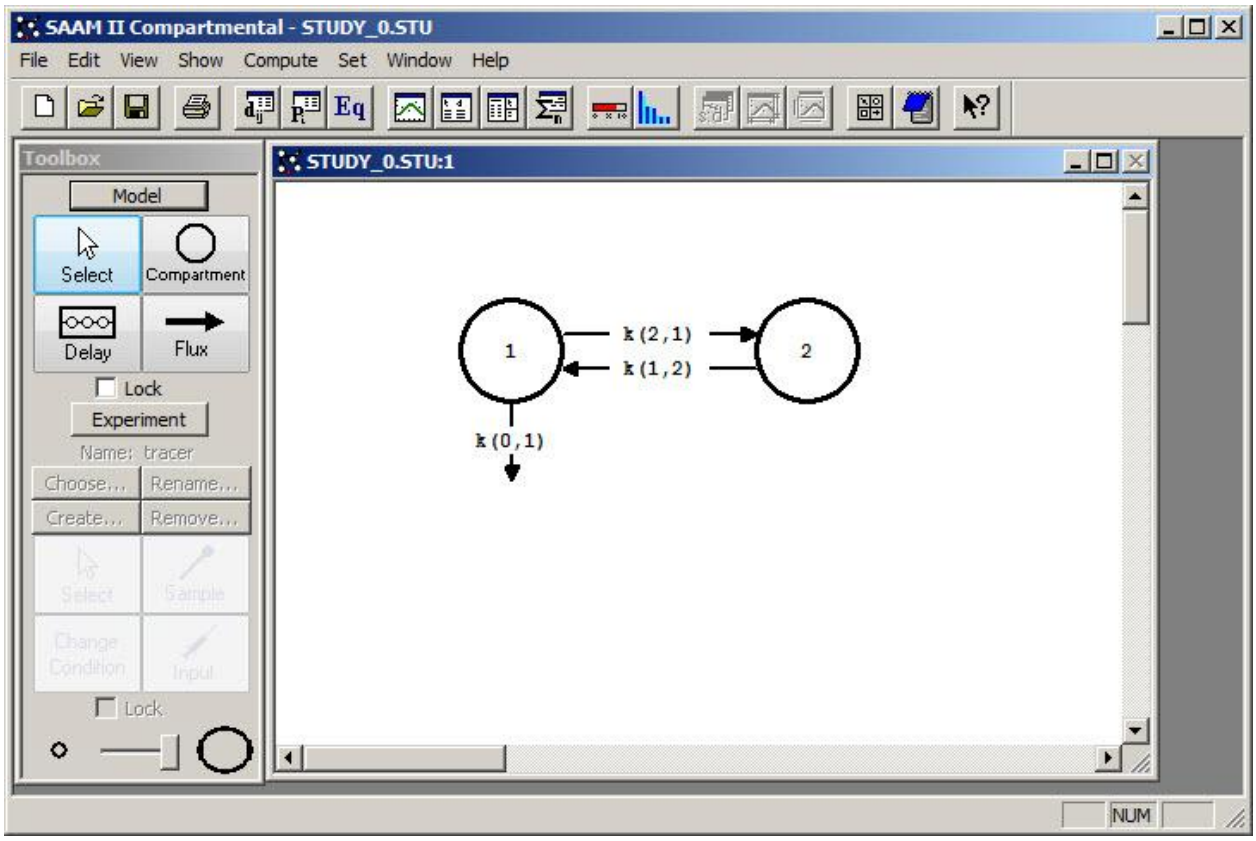
This tutorial will show you have to save some material in the **Notes** window. What is illustrated is not exhaustive as you have many options.

1. **Start** the **SAAM II Compartmental** application. The **SAAM II Compartmental** main window will open.

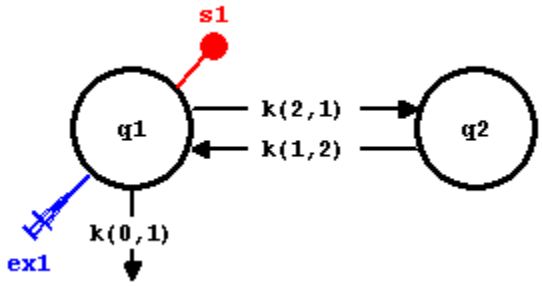
2. Open the **SAAM II Compartmental** study file **study_0**.

   a. The file **study_0.stu** should appear in the file list; if it does not, find the folder where you put this tutorial.

   b. In the **File** menu, click **Open**. The **SAAM II Compartmental** main window will appear as shown below:



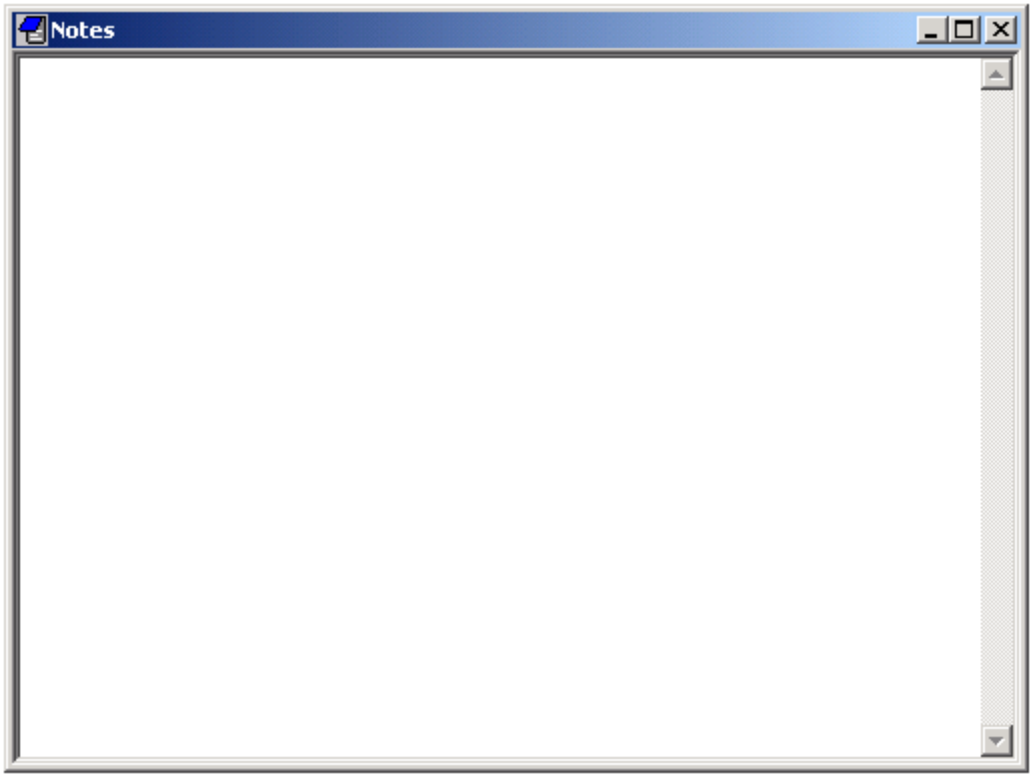
3. View the model and the experiment on the model. In the **SAAM II Toolbox**, click **Experiment**. The model of the experiment will appear on the **Drawing Canvas** as follows:



This is the experimental model developed and used in the **Getting Started with Compartmental** tutorial.

4. The **Notes** window – creating baseline information. (this information can be automatically saved by saving results to text file, append)

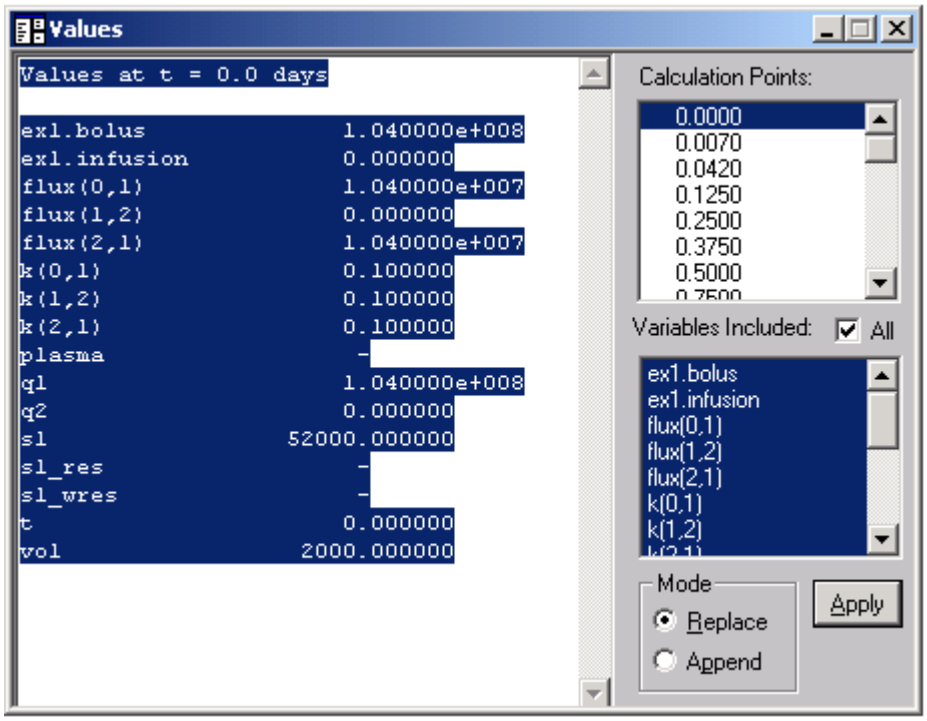
   a. In the **Show** menu, click **Notes**, or alternatively, on the **SAAM II Toolbar** click **Notes**  . The **Notes** window will open as shown below:



b. Type “Work with study_0 on January 1, 2011” as the first line of the **Notes** window.

c. Solve the model. In the **Compute** menu, click **Solve**, or alternatively, on the **SAAM II Toolbar,** click **Solve**  .

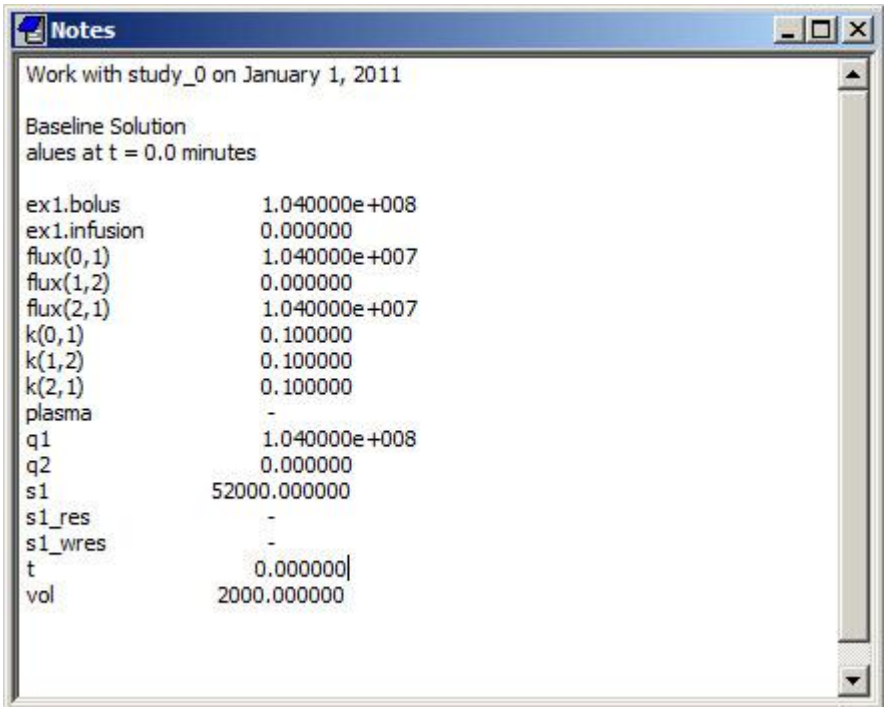
c. In the **Show** menu, click **Values**, or alternatively, on the **SAAM II Toolbar** click **Values**  . The **Values** window will open. Select the material as shown below:



d. In the **Edit** menu, click **Copy**. You may also Right-Click and select Copy or simply type “Ctrl + c”. Close the **Values** window.

e. In the **Notes** window, line down and type “Baseline Solution”.

f. In the **Edit** menu, click **Paste** or “Ctrl + v”. The **Notes** window will appear as follows:



Your **Notes** window now contains information about the baseline solution, i.e. the solution with the set of parameter values indicated, and the bolus injection also as indicated. Notice the initial value for **q1** equals **ex1.bolus**; this is because "q1(0) = ex1.bolus", i.e. the initial conditions for q1(t) are **ex1.bolus**. Similarly at time zero, q2(0) = 0 since there is no initial input into **q2**. There is no data "plasma" at time zero since there was no measured value at time zero. Finally, there are no values for **s1_res** or **s1_wres** since the model has not been fitted to the data.

Leave the **Notes** window open.

Using Notes. You can record information about all your modeling activities in the Notes window. If you were to hand-fit the model to the data, you can record the values following each change in parameter values. You can copy information from the **Table** window into the **Notes** window. You cannot copy a plot into the **Notes** window.

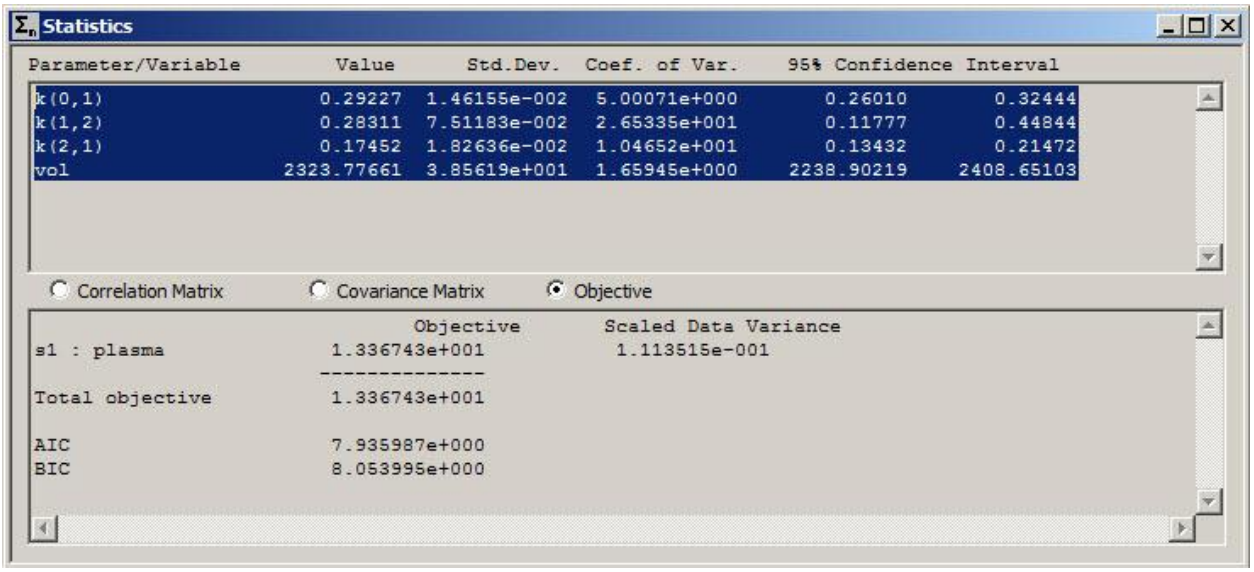
5. The **Notes** window – saving information following a fit.

   a. Fit the model to your data. In the **Compute** menu, click **Fit**, or alternatively, on the **SAAM II Toolbar** click **Fit**  .

   b. In the **Notes** window, type "Results following a Fit".

   c. In the **Show** menu, click **Statistics**, or alternatively on the **SAAM II Toolbar** click **Statistics**  . The **Statistics** window will open.

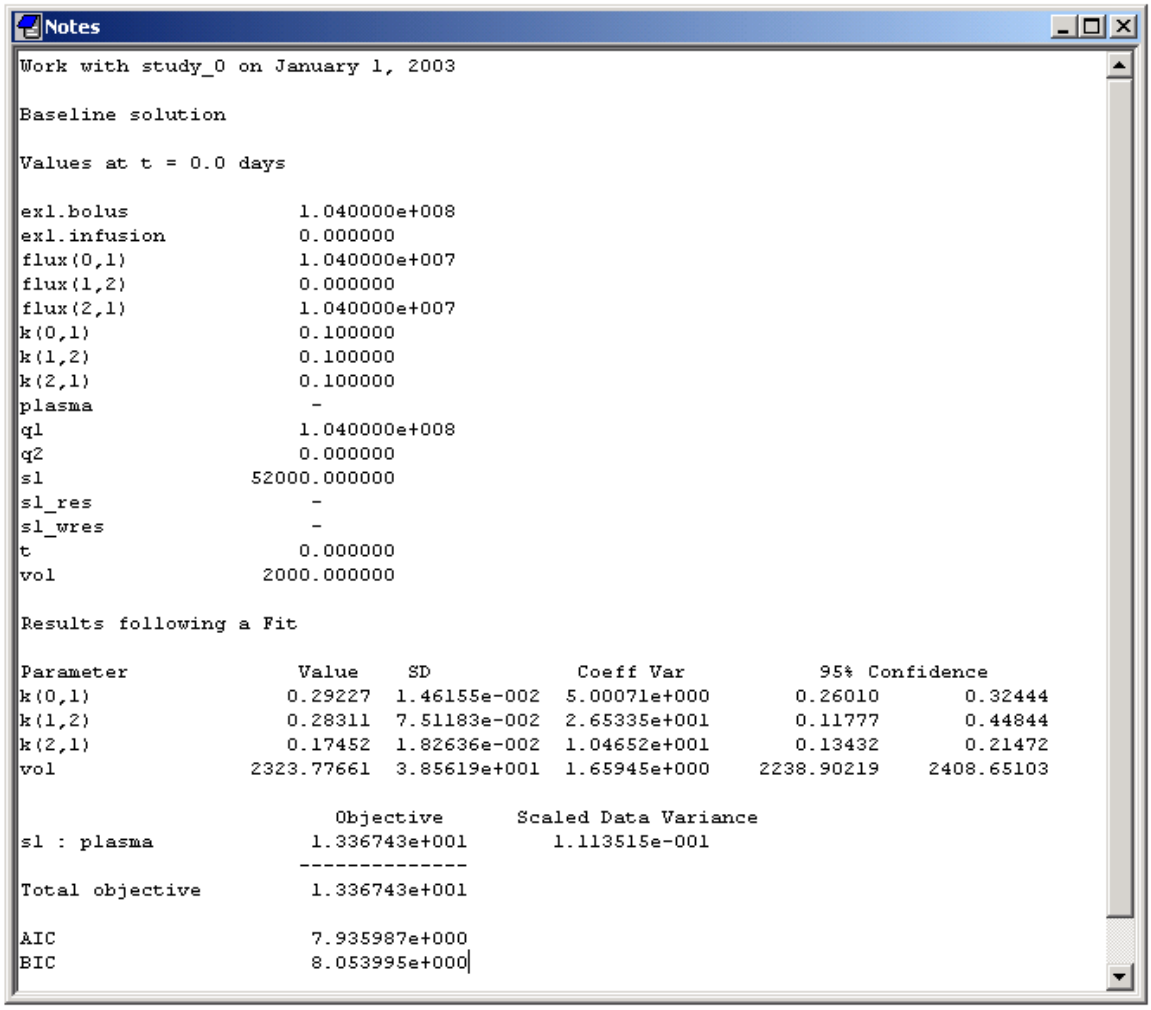
   d. Select and copy the material in the top pane of the **Statistics** window. The **Statistics** window will appear as follows:



   e. Return to the **Notes** window. Right-click in the **Notes** window and select **Paste**, or in the **Edit** menu, click **Paste**. The copied material will appear in the **Notes** window. It is not possible to copy the labels of each column, so you will have to type them in yourself (as shown below).

   f. Return to the **Statistics** window, select and copy the information in the bottom page.

   g. Return to the **Notes** window. In the **Edit** menu, click **Paste**. The **Notes** window will appear as follows:



h. Close the **Notes** window.

Quit the **SAAM II Compartmental** application. Do not save the changes to **study_0**.

The **Notes** window acts like a note pad. It is a text file into which you can type your own notes and paste information generated during your SAAM II modeling session. If you were to save your study file, your notes will be saved so the next time you open the study file, the notes will be there.

You can also copy the contents of your **Notes** window into other applications such as Microsoft Word®. Notes are very flexible and helpful for keeping track of your modeling activities.

Part 2. Creating Text Files

SAAM II has the option of creating text files every time you Solve or Fit. There are three levels of information, Basic, Detailed and All. A quick summary of the type of information contained in each report is shown below. The reports will be explained in this tutorial since the level of information you need to write your report may vary depending upon the type of report you are preparing.

SAAM II Save Results Options			
Information Type	**Basic**	**Detailed**	**All**
Study Information	**X**	**X**	**X**
Computational Settings	**X**	**X**	**X**
Experimental Attributes		**X**	**X**
Model Equations			**X**
Data			**X**
Exogenous Inputs			**X**
Change Conditions			**X**
General Model Information			**X**
Parameter Values		**X**	**X**
Values at t=0.0	**X**	**X**	**X**
Calculated Samples and Data	**X**	**X**	**X**
Statistics	**X**	**X**	**X**
Notes		**X**	**X**

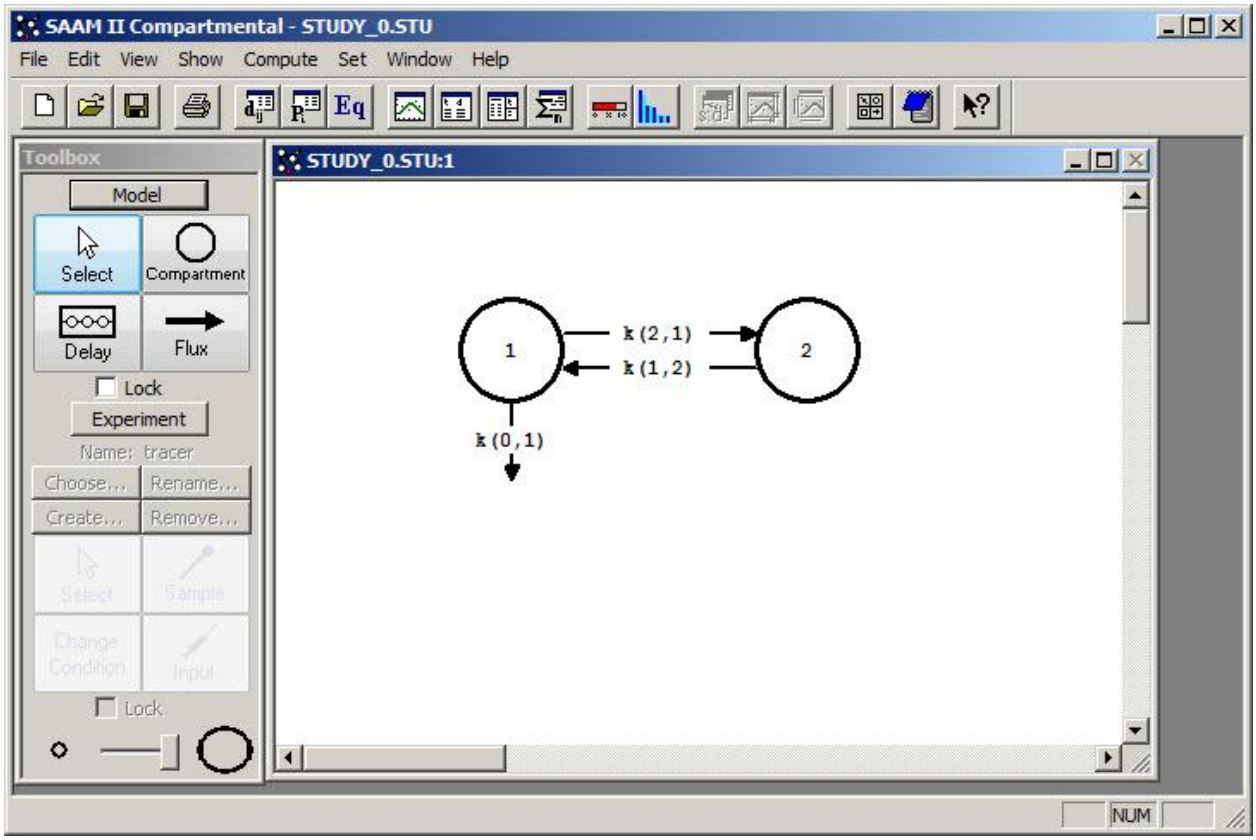
You also have the option of over writing the text file after each Solve or Fit; this is helpful if you are concerned about using a lot of space, and don't need the intermediate information. Alternatively, you can create a new file after each Solve or Fit; they are named in such a way that you can follow what you did sequentially.

1. **Start** the **SAAM II Compartmental** application. The **SAAM II Compartmental** main window will open.

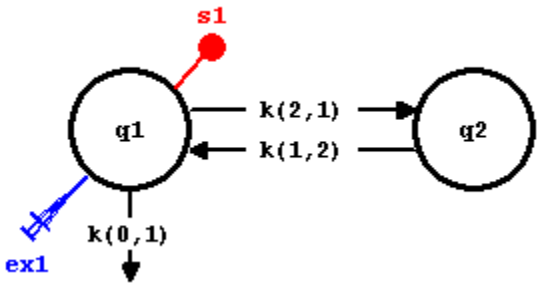
2. Open the **SAAM II Compartmental** study file **study_0**.

   a. The file **study_0.stu** should appear in the file list; if it does not, find the folder where you put this file.

   b. In the **File** menu, click **Open**. The **SAAM II Compartmental** main window will appear as shown below:



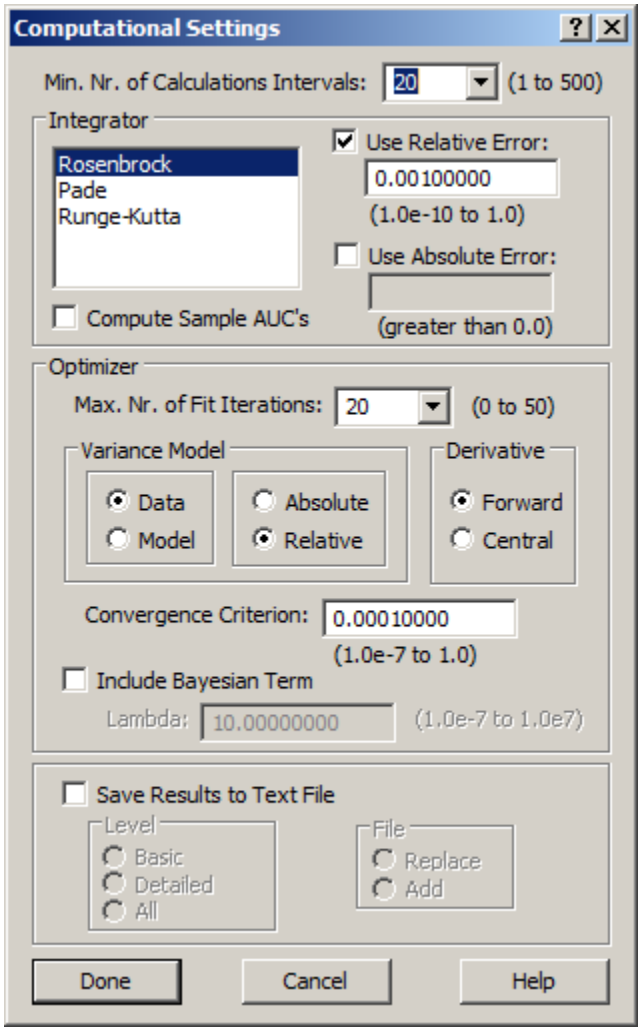
3. View the model and the experiment on the model. In the **SAAM II Toolbox**, click **Experiment**. The model of the experiment will appear on the **Drawing Canvas** as follows:



This is the experimental model developed and used in the **Getting Started with Compartmental** tutorial.

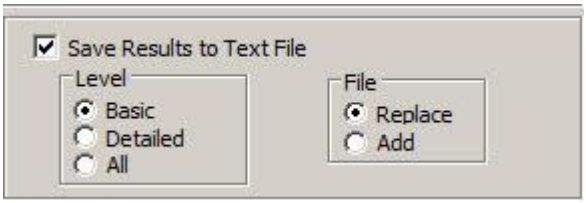
4. Turning on the Save Results option.

   a. In the **Compute** menu, click **Settings**. The **Computational Settings** dialog box will open as shown below:



The bottom pane of the dialog box contains the **Save Results to Text File** check box. If this box is checked, the **Level** and **File** panes become active.

b. Select **Save Results to Text File**. The pane will appear as follows:



The default settings are Basic-Replace meaning just the basic information is written to the file, and the file is replaced if you do another Solve or Fit.

c. Click **Done**.

5. Solve the model, and view the text file created.

a. In the **Compute** menu, click **Solve**, or alternatively, on the **SAAM II Toolbar,** click **Solve**  .

b. Go to the folder where **study_0** is located. In this folder, you will find a file entitled **study_0.txt**. The contents of this file are shown below:

```
Study Name:  study_0.stu
Basic Summary Output
Date:  07:29 AM, Tuesday, January 18, 2011
Application:  Compartmental
Type of Calculation:  Solve
-------------------------------------------------------------------------

Computational Settings

Integrator:  Rosenbrock
Relative Integrator Error:  1.0000e-003
-------------------------------------------------------------------------

Values at t = 0.0 days

ex1.bolus              1.040000e+008
ex1.infusion           0.000000
flux(0,1)              1.040000e+007
flux(1,2)              0.000000
flux(2,1)              1.040000e+007
k(0,1)                 0.100000
k(1,2)                 0.100000
k(2,1)                 0.100000
plasma                  -
q1                     1.040000e+008
q2                     0.000000
s1                  52000.000000
s1_res                  -
s1_wres                 -
t                      0.000000
vol                 2000.000000
-------------------------------------------------------------------------

Calculated Sample Values and Data


          t       plasma       Weight           s1      s1_wres
 0.000e+000         -            -      5.200e+004         -
 7.000e-003   4.678e+004         -      5.193e+004         -
 4.200e-002   4.352e+004         -      5.157e+004         -
 1.250e-001   4.254e+004         -      5.072e+004         -
 2.500e-001   4.013e+004         -      4.948e+004         -
 3.750e-001   3.622e+004         -      4.828e+004         -
 5.000e-001   3.556e+004         -      4.711e+004         -
 7.500e-001         -            -      4.489e+004         -
 1.000e+000   2.819e+004         -      4.279e+004         -
 1.450e+000         -            -      3.934e+004         -
 1.725e+000         -            -      3.741e+004         -
 2.000e+000   1.957e+004         -      3.561e+004         -
 2.450e+000         -            -      3.290e+004         -
```

```
 2.725e+000          -           -      3.139e+004          -
 3.000e+000   1.440e+004          -      2.997e+004          -
 3.450e+000          -           -      2.785e+004          -
 3.725e+000          -           -      2.666e+004          -
 4.000e+000   1.128e+004          -      2.554e+004          -
 4.450e+000          -           -      2.386e+004          -
 4.725e+000          -           -      2.292e+004          -
 5.000e+000   8.081e+003          -      2.204e+004          -
 5.450e+000          -           -      2.070e+004          -
 5.725e+000          -           -      1.996e+004          -
 6.000e+000   6.999e+003          -      1.925e+004          -
 6.450e+000          -           -      1.819e+004          -
 6.725e+000          -           -      1.759e+004          -
 7.000e+000   5.653e+003          -      1.702e+004          -
 7.450e+000          -           -      1.616e+004          -
 7.725e+000          -           -      1.568e+004          -
 8.000e+000   5.139e+003          -      1.522e+004          -
 8.450e+000          -           -      1.453e+004          -
 8.725e+000          -           -      1.413e+004          -
 9.000e+000          -           -      1.376e+004          -
 9.000e+000   4.210e+003          -      1.376e+004          -
-------------------------------------------------------------------------------

Statistics

No Statistics after a Solve
-------------------------------------------------------------------------------
```

The first line of the file is simply the name of the study file. The next is the type of output, in this case, Basic. Next is the date followed by the SAAM II Application, in this case, Compartmental. Finally, the type of calculation which produced the output is given, in this case, Solve.

The Computational settings provide the chosen integrator and the setting for the Relative Integrator Error.

This is followed by the values at time zero. This information is the same as that in the **Values** window at time zero.

The calculated sample values and data come next in a table. Notice the weights or weighted residuals are not given; this is because the calculation was a Solve and not a Fit.

Values for **s1** are given at all calculation points; this is why there are more **s1** values here than for data. Remember the number of calculation points is set in the **Computational Settings** dialog box in the **Min. Nr. Calculation Intervals** box.

This information can be cut from the text window and pasted into another application for you to prepare your report.

c. Close the text file and return to **study_0**.

6. Fit the model, and view the text file created.

   a. In the **Compute** menu, click **Fit**, or alternatively, on the **SAAM II Toolbar** click **Fit**  .

   b. Go to the folder where **study_0** is located. In this folder, you will find the file **study_0.txt**. This file contains the following information (note the previous file has been over written):

```
Study Name:  study_0.stu
Basic Summary Output
Date:  02:40 PM, Tuesday, January 17, 2011
Application:  Compartmental
Type of Calculation:  Fit
--------------------------------------------------------------------------------

Computational Settings

Integrator:  Rosenbrock
Relative Integrator Error:  1.0000e-003
Variance Model:  Data, Relative
Derivative:  Forward
--------------------------------------------------------------------------------

Values at t = 0.0 days

ex1.bolus              1.040000e+008
ex1.infusion           0.000000
flux(0,1)              3.039597e+007
flux(1,2)              0.000000
flux(2,1)              1.814980e+007
k(0,1)                 0.292269
k(1,2)                 0.283108
k(2,1)                 0.174517
plasma                  -
q1                     1.040000e+008
q2                     0.000000
s1                  44754.732253
s1_res                  -
s1_wres                 -
t                      0.000000
vol                  2323.776610
--------------------------------------------------------------------------------

Calculated Sample Values and Data


         t       plasma       Weight           s1      s1_wres
 0.000e+000         -            -      4.475e+004         -
 7.000e-003   4.678e+004   4.104e-007   4.461e+004   1.391e+000
 4.200e-002   4.352e+004   4.741e-007   4.389e+004  -2.519e-001
 1.250e-001   4.254e+004   4.964e-007   4.223e+004   2.117e-001
 2.500e-001   4.013e+004   5.578e-007   3.989e+004   1.772e-001
```

```
 3.750e-001   3.622e+004   6.845e-007   3.770e+004  -1.225e+000
 5.000e-001   3.556e+004   7.101e-007   3.566e+004  -8.650e-002
 7.500e-001         -            -      3.200e+004         -
 1.000e+000   2.819e+004   1.130e-006   2.880e+004  -6.469e-001
 1.450e+000         -            -      2.405e+004         -
 1.725e+000         -            -      2.166e+004         -
 2.000e+000   1.957e+004   2.344e-006   1.960e+004  -4.317e-002
 2.450e+000         -            -      1.680e+004         -
 2.725e+000         -            -      1.537e+004         -
 3.000e+000   1.440e+004   4.329e-006   1.412e+004   5.867e-001
 3.450e+000         -            -      1.240e+004         -
 3.725e+000         -            -      1.151e+004         -
 4.000e+000   1.128e+004   7.061e-006   1.072e+004   1.494e+000
 4.450e+000         -            -      9.603e+003         -
 4.725e+000         -            -      9.016e+003         -
 5.000e+000   8.081e+003   1.375e-005   8.487e+003  -1.507e+000
 5.450e+000         -            -      7.728e+003         -
 5.725e+000         -            -      7.319e+003         -
 6.000e+000   6.999e+003   1.833e-005   6.944e+003   2.355e-001
 6.450e+000         -            -      6.395e+003         -
 6.725e+000         -            -      6.093e+003         -
 7.000e+000   5.653e+003   2.810e-005   5.813e+003  -8.504e-001
 7.450e+000         -            -      5.396e+003         -
 7.725e+000         -            -      5.162e+003         -
 8.000e+000   5.139e+003   3.401e-005   4.943e+003   1.142e+000
 8.450e+000         -            -      4.612e+003         -
 8.725e+000         -            -      4.424e+003         -
 9.000e+000         -            -      4.246e+003         -
 9.000e+000   4.210e+003   5.067e-005   4.246e+003  -2.582e-001
-------------------------------------------------------------------------

Statistics

Parameter/Variable      Value      Std.Dev. Coef. of Var.   95% Confidence Interval
------------------    -------      -------- -------------    -----------------------
k(0,1)                0.29227  1.46155e-002  5.00071e+000       0.26010       0.32444
k(1,2)                0.28311  7.51183e-002  2.65335e+001       0.11777       0.44844
k(2,1)                0.17452  1.82636e-002  1.04652e+001       0.13432       0.21472
vol                2323.77661  3.85619e+001  1.65945e+000    2238.90219    2408.65103


          Objective      Scaled Data Variance
             s1 : plasma             1.336743e+001       1.113515e-001
                                    --------------
             Total objective         1.336743e+001

             AIC                     7.935987e+000
             BIC                     8.053995e+000

             Number of Iterations Required to Fit: 5
             -------------------------------------------------------------------------
```

This contains the same information as that following a Solve except information about the Fit and statistics is available.

c. Close **study_0.txt**, and return to **study_0.stu**.

Quit the **SAAM II Compartmental** application. Do not save the changes to **study_0**.

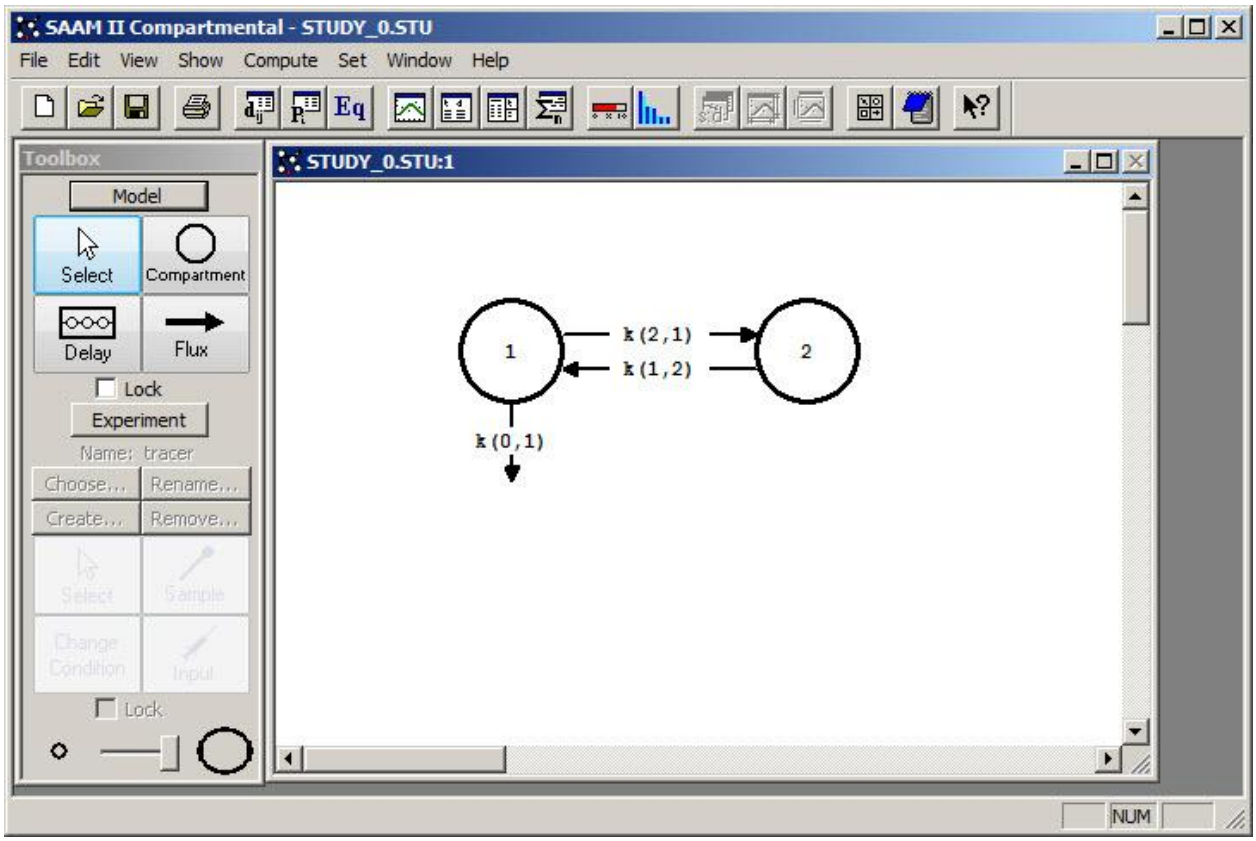
You will now repeat what you did above, only observe the **Detailed** output and set the **File** option to **Add**.

1. **Start** the **SAAM II Compartmental** application. The **SAAM II Compartmental** main window will open.

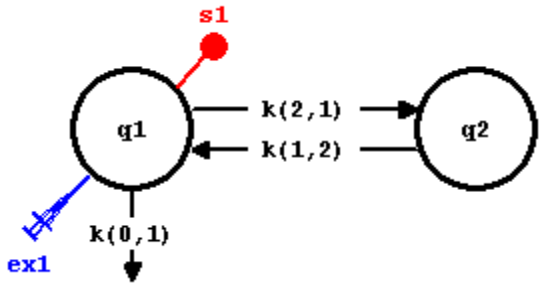
2. Open the **SAAM II Compartmental** study file **study_0**.

   a. The file **study_0.stu** should appear in the file list; if it does not, find the folder where you put this tutorial.

   b. In the **File** menu, click **Open**. The **SAAM II Compartmental** main window will appear as shown below:

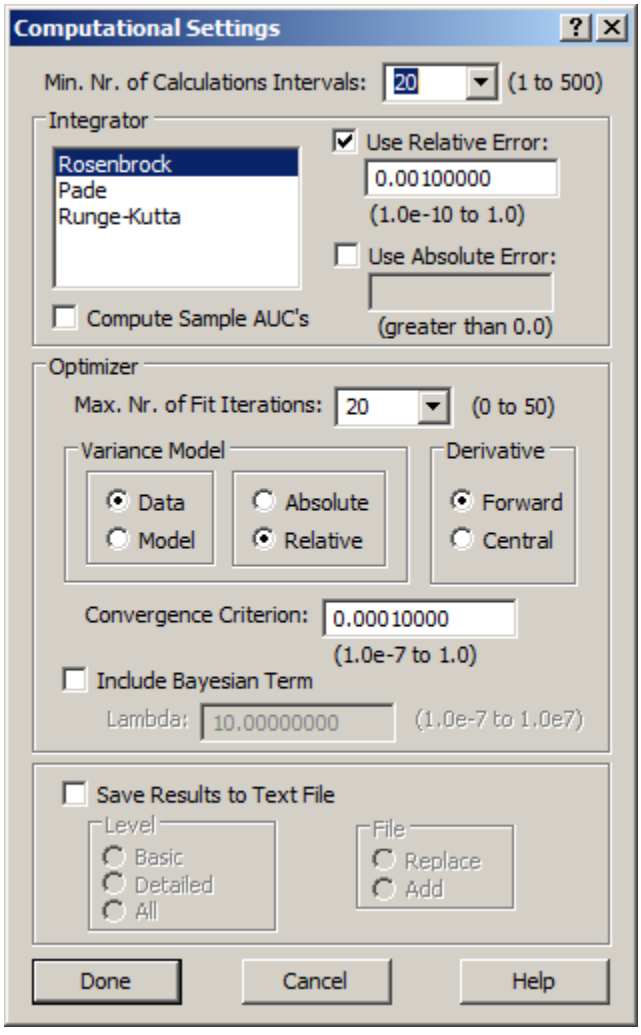


3. View the model and the experiment on the model. In the **SAAM II Toolbox**, click **Experiment**. The model of the experiment will appear on the **Drawing Canvas** as follows:



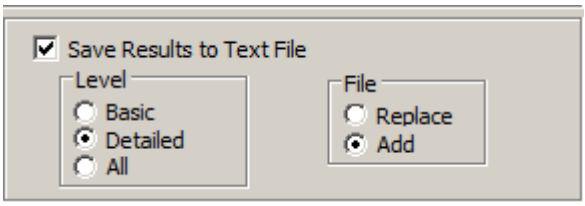
4. Turning on the Save Results option.

   a. In the **Compute** menu, click **Settings**. The **Computational Settings** dialog box will open as shown below:



   The bottom pane of the dialog box contains the **Save Results to Text File** check box. If this box is checked, the **Level** and **File** panes become active.

b. Select **Save Results to Text File**. In the **Level** pane, select **Detailed**. In the **File** pane, select **Add**. The panes will appear as follows.



c. Click **Done**. You will now produce more detailed information, and will produce a file each time you Solve or Fit.

5. Solve the model, and view the text file created.

a. In the **Compute** menu, click **Solve**, or alternatively, on the **SAAM II Toolbar,** click **Solve**  .

b. Go to the folder where **study_0** is located. In this folder, you will find a file entitled **study_0.txt**. The contents of this file are shown below:

```
Study Name:  study_0.stu
Detailed Summary Output
Date:  07:36 AM, Tuesday, January 17, 2011
Application:  Compartmental
Type of Calculation:  Solve
-------------------------------------------------------------------------

Computational Settings

Number of Calculation Intervals:  20
Integrator:  Rosenbrock
Relative Integrator Error:  1.0000e-003
Maximum Number of Iterations: 20
-------------------------------------------------------------------------

Experiment Attributes

Independent Variable: t (days)
Start of Experiment: 0.0000e+000
End of Experiment:   9.0000e+000
-------------------------------------------------------------------------

Parameter Values

Parameter     Type Prior Value   New Value Lower Limit Upper Limit
--------------- --- ----------- ----------- ----------- -----------
k(0,1)         Adj  1.000e-001  1.000e-001  1.000e-002  1.000e+000
k(1,2)         Adj  1.000e-001  1.000e-001  1.000e-002  1.000e+000
k(2,1)         Adj  1.000e-001  1.000e-001  1.000e-002  1.000e+000
vol           Adj  2.000e+003  2.000e+003  2.000e+002  2.000e+004
-------------------------------------------------------------------------
```

Values at t = 0.0 days

ex1.bolus	1.040000e+008
ex1.infusion	0.000000
flux(0,1)	1.040000e+007
flux(1,2)	0.000000
flux(2,1)	1.040000e+007
k(0,1)	0.100000
k(1,2)	0.100000
k(2,1)	0.100000
plasma	-
q1	1.040000e+008
q2	0.000000
s1	52000.000000
s1_res	-
s1_wres	-
t	0.000000
vol	2000.000000

Calculated Sample Values and Data

t	plasma	Weight	s1	s1_wres
0.000e+000	-	-	5.200e+004	-
7.000e-003	4.678e+004	-	5.193e+004	-
4.200e-002	4.352e+004	-	5.157e+004	-
1.250e-001	4.254e+004	-	5.072e+004	-
2.500e-001	4.013e+004	-	4.948e+004	-
3.750e-001	3.622e+004	-	4.828e+004	-
5.000e-001	3.556e+004	-	4.711e+004	-
7.500e-001	-	-	4.489e+004	-
1.000e+000	2.819e+004	-	4.279e+004	-
1.450e+000	-	-	3.934e+004	-
1.725e+000	-	-	3.741e+004	-
2.000e+000	1.957e+004	-	3.561e+004	-
2.450e+000	-	-	3.290e+004	-
2.725e+000	-	-	3.139e+004	-
3.000e+000	1.440e+004	-	2.997e+004	-
3.450e+000	-	-	2.785e+004	-
3.725e+000	-	-	2.666e+004	-
4.000e+000	1.128e+004	-	2.554e+004	-
4.450e+000	-	-	2.386e+004	-
4.725e+000	-	-	2.292e+004	-
5.000e+000	8.081e+003	-	2.204e+004	-
5.450e+000	-	-	2.070e+004	-
5.725e+000	-	-	1.996e+004	-
6.000e+000	6.999e+003	-	1.925e+004	-
6.450e+000	-	-	1.819e+004	-
6.725e+000	-	-	1.759e+004	-
7.000e+000	5.653e+003	-	1.702e+004	-
7.450e+000	-	-	1.616e+004	-
7.725e+000	-	-	1.568e+004	-
8.000e+000	5.139e+003	-	1.522e+004	-
8.450e+000	-	-	1.453e+004	-
8.725e+000	-	-	1.413e+004	-
9.000e+000	-	-	1.376e+004	-
9.000e+000	4.210e+003	-	1.376e+004	-

```
Statistics

No Statistics after a Solve
--------------------------------------------------------------------------

Notes

None
--------------------------------------------------------------------------
```

This file contains all of the information contained in the "Basic" option plus additional information. There is more information about the Computational Settings. The file contains the Experimental Attributes and the initial parameter values. Finally, at the very end, are the contents of the **Notes** window. In this case there are no notes. If you have information in the **Notes** window, it would appear here.

c. Close the text file, and return to **study_0**.

6. Fit the model, and view the text file created.

a. In the **Compute** menu, click **Fit**, or alternatively, on the **SAAM II Toolbar** click **Fit**  .

b. Go to the folder where **study_0** is located. In this folder, you will find a file entitled **study_0.txt**. and **study_0_01.txt**

The file **study_0_01** contains the information following the Fit. Each time you solve or fit, you will produce a file with a number such as "01" after it. If you are doing this several times, it is useful to keep track of the number using Notes.

The contents of **study_0_01** are shown below.

```
Study Name:  study_0.stu
Detailed Summary Output
Date:  07:38 AM, Tuesday, January 17, 2011
Application:  Compartmental
Type of Calculation:  Fit
--------------------------------------------------------------------------

Computational Settings

Number of Calculation Intervals:  20
Integrator:  Rosenbrock
Relative Integrator Error:  1.0000e-003
Maximum Number of Iterations: 20
Variance Model:  Data, Relative
```

Derivative: Forward

Experiment Attributes

Independent Variable: t (days)
Start of Experiment: 0.0000e+000
End of Experiment: 9.0000e+000

Parameter Values

Parameter	Type	Prior Value	New Value	Lower Limit	Upper Limit
k(0,1)	Adj	1.000e-001	2.923e-001	1.000e-002	1.000e+000
k(1,2)	Adj	1.000e-001	2.831e-001	1.000e-002	1.000e+000
k(2,1)	Adj	1.000e-001	1.745e-001	1.000e-002	1.000e+000
vol	Adj	2.000e+003	2.324e+003	2.000e+002	2.000e+004

Values at t = 0.0 days

ex1.bolus	1.040000e+008
ex1.infusion	0.000000
flux(0,1)	3.039597e+007
flux(1,2)	0.000000
flux(2,1)	1.814980e+007
k(0,1)	0.292269
k(1,2)	0.283108
k(2,1)	0.174517
plasma	-
q1	1.040000e+008
q2	0.000000
s1	44754.732253
s1_res	-
s1_wres	-
t	0.000000
vol	2323.776610

Calculated Sample Values and Data

t	plasma	Weight	s1	s1_wres
0.000e+000	-	-	4.475e+004	-
7.000e-003	4.678e+004	4.104e-007	4.461e+004	1.391e+000
4.200e-002	4.352e+004	4.741e-007	4.389e+004	-2.519e-001
1.250e-001	4.254e+004	4.964e-007	4.223e+004	2.117e-001
2.500e-001	4.013e+004	5.578e-007	3.989e+004	1.772e-001
3.750e-001	3.622e+004	6.845e-007	3.770e+004	-1.225e+000
5.000e-001	3.556e+004	7.101e-007	3.566e+004	-8.650e-002
7.500e-001	-	-	3.200e+004	-
1.000e+000	2.819e+004	1.130e-006	2.880e+004	-6.469e-001
1.450e+000	-	-	2.405e+004	-
1.725e+000	-	-	2.166e+004	-
2.000e+000	1.957e+004	2.344e-006	1.960e+004	-4.317e-002
2.450e+000	-	-	1.680e+004	-
2.725e+000	-	-	1.537e+004	-
3.000e+000	1.440e+004	4.329e-006	1.412e+004	5.867e-001

```
 3.450e+000         -            -      1.240e+004         -
 3.725e+000         -            -      1.151e+004         -
 4.000e+000   1.128e+004   7.061e-006   1.072e+004   1.494e+000
 4.450e+000         -            -      9.603e+003         -
 4.725e+000         -            -      9.016e+003         -
 5.000e+000   8.081e+003   1.375e-005   8.487e+003  -1.507e+000
 5.450e+000         -            -      7.728e+003         -
 5.725e+000         -            -      7.319e+003         -
 6.000e+000   6.999e+003   1.833e-005   6.944e+003   2.355e-001
 6.450e+000         -            -      6.395e+003         -
 6.725e+000         -            -      6.093e+003         -
 7.000e+000   5.653e+003   2.810e-005   5.813e+003  -8.504e-001
 7.450e+000         -            -      5.396e+003         -
 7.725e+000         -            -      5.162e+003         -
 8.000e+000   5.139e+003   3.401e-005   4.943e+003   1.142e+000
 8.450e+000         -            -      4.612e+003         -
 8.725e+000         -            -      4.424e+003         -
 9.000e+000         -            -      4.246e+003         -
 9.000e+000   4.210e+003   5.067e-005   4.246e+003  -2.582e-001
--------------------------------------------------------------------------
```

Statistics

Parameter/Variable	Value	Std.Dev.	Coef. of Var.	95% Confidence Interval	
k(0,1)	0.29227	1.46155e-002	5.00071e+000	0.26010	0.32444
k(1,2)	0.28311	7.51183e-002	2.65335e+001	0.11777	0.44844
k(2,1)	0.17452	1.82636e-002	1.04652e+001	0.13432	0.21472
vol	2323.77661	3.85619e+001	1.65945e+000	2238.90219	2408.65103

```
                            Objective      Scaled Data Variance
s1 : plasma                1.336743e+001       1.113515e-001
                           -------------
Total objective            1.336743e+001

AIC                        7.935987e+000
BIC                        8.053995e+000

Number of Iterations Required to Fit: 5
--------------------------------------------------------------------------

Notes

None
--------------------------------------------------------------------------
```

The information parallels that following the Solve except now information on the Fit is available. This includes the weights and weighted residuals, and the information from the **Statistics** window. It also includes the number of iterations required to Fit the data.

If you had information in the **Notes** window, it would appear at the end of this file.

c. Close the text file, and return to **study_0.stu**.

This information can be cut from the text window and pasted into another application for you to prepare your report.

Quit the **SAAM II Compartmental** application. Do not save the changes to **study_0**.

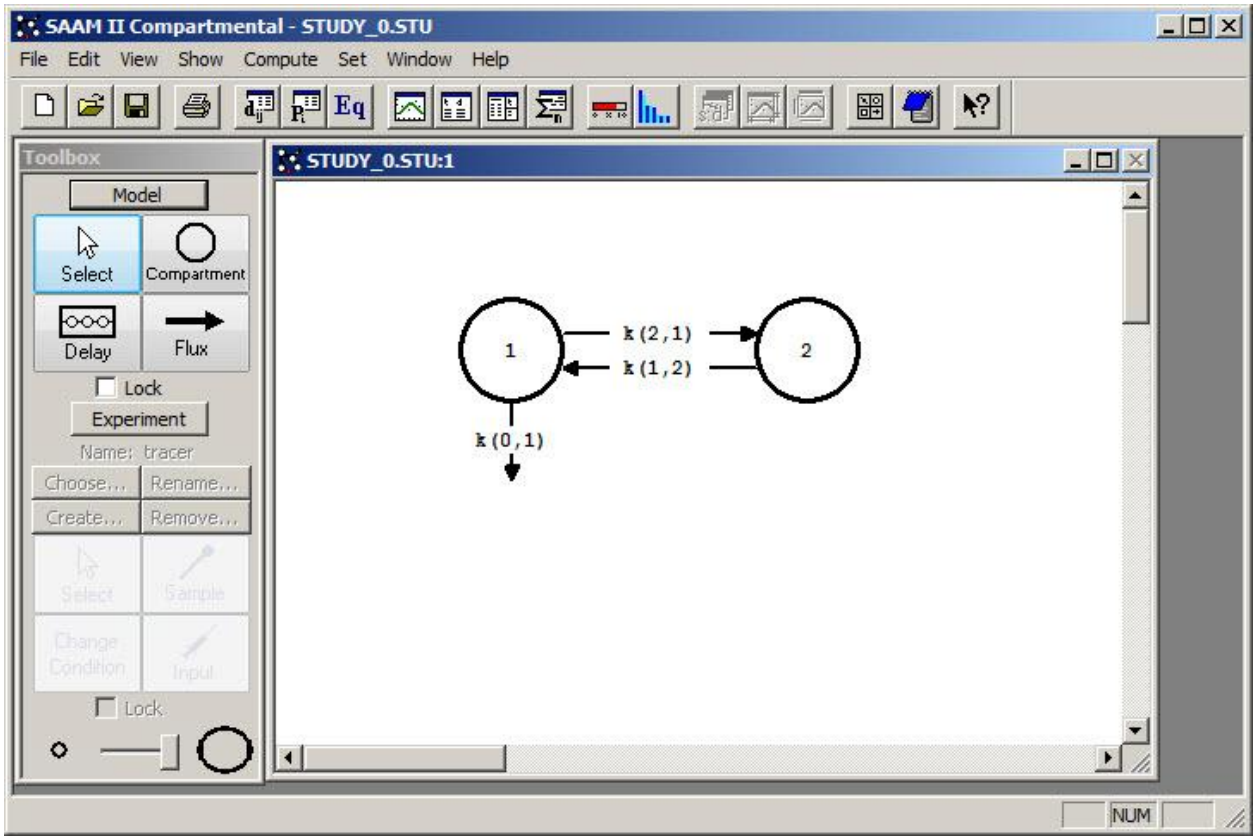
You will now repeat what you did above, only select the **All** output and set the **File** option to **Add**.

1. **Start** the **SAAM II Compartmental** application. The **SAAM II Compartmental** main window will open.

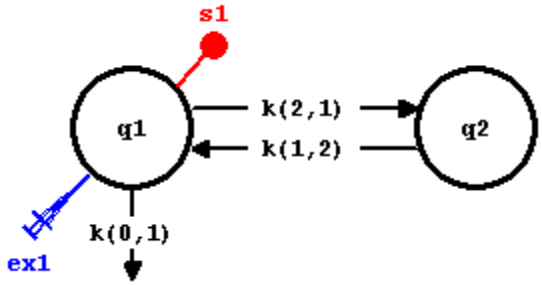
2. Open the **SAAM II Compartmental** study file **study_0**.

   a. The file **study_0.stu** should appear in the file list; if it does not, find the folder where you put this tutorial.

   b. In the **File** menu, click **Open**. The **SAAM II Compartmental** main window will appear as shown below:

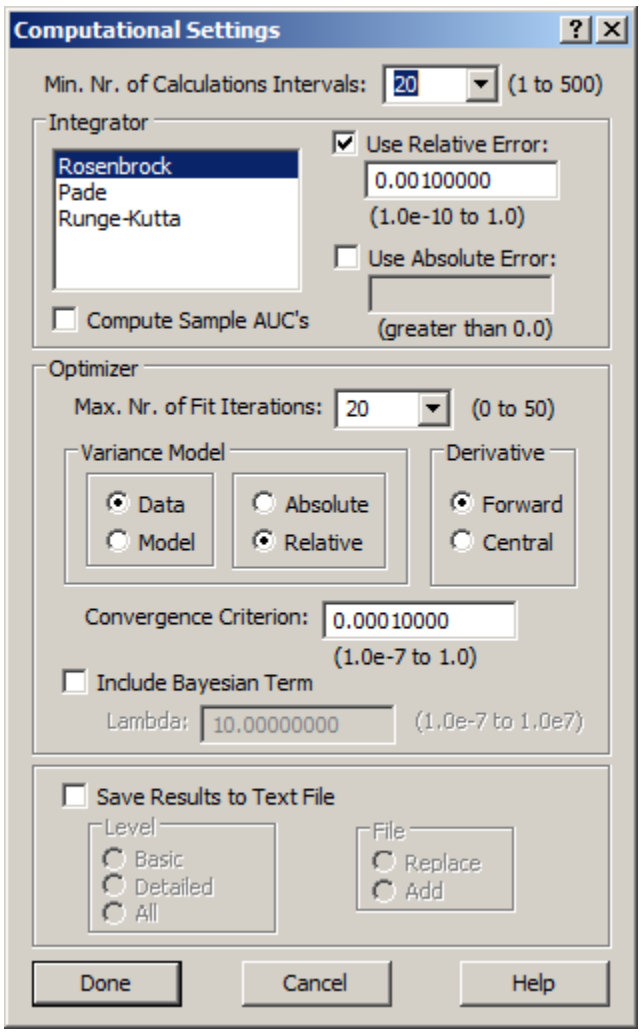


3. View the model and the experiment on the model. In the **SAAM II Toolbox**, click **Experiment**. The model of the experiment will appear on the **Drawing Canvas** as follows:



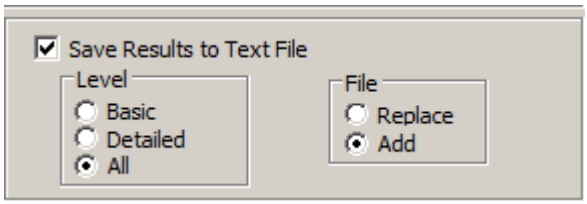
4. Turning on the Save Results option.

   a. In the **Compute** menu, click **Settings**. The **Computational Settings** dialog box will open as shown below:



The bottom pane of the dialog box contains the **Save Results to Text File** check box. If this box is checked, the **Level** and **File** panes become active.

b. Select **Save Results to Text File**. In the **Level** pane, select **All**. In the **File** pane, select **Add**.



c. Click **Done**. You will now produce more detailed information, and will produce a file **each time you Solve or Fit**.

5. Solve the model, and view the text file created.

a. In the **Compute** menu, click **Solve**, or alternatively, on the **SAAM II Toolbar,** click **Solve**  .

b. Go to the folder where **study_0** is located. In this folder, you will find a file entitled **study_0.txt**. The contents of this file are shown below:

```
Study Name:  study_0.stu
Model and Detailed Summary Output
Date:  08:08 AM, Tuesday, January 17, 2011
Application:  Compartmental
Type of Calculation:  Solve
-------------------------------------------------------------------------

Computational Settings

Number of Calculation Intervals:  20
Integrator:  Rosenbrock
Relative Integrator Error:  1.0000e-003
Maximum Number of Iterations: 20
-------------------------------------------------------------------------

Experiment Attributes

Independent Variable: t (days)
Start of Experiment: 0.0000e+000
End of Experiment:   9.0000e+000
-------------------------------------------------------------------------

Model Equations

flux(1,2) = k(1,2) * q2
flux(2,1) = k(2,1) * q1
flux(0,1) = k(0,1) * q1
ex1.bolus = 0.0
ex1.infusion = 0.0
s1 = q1/vol
q1' = + k(1,2)*q2 - k(2,1)*q1 - k(0,1)*q1 + ex1
q2' = - k(1,2)*q2 + k(2,1)*q1
-------------------------------------------------------------------------

Data

DATA
(FSD 0.1)
t      plasma
0.007  46780
0.042  43522
0.125  42535
0.25   40125
0.375  36221
0.5    35562
1.0    28194
2.0    19573
3.0    14403
4.0    11278
5.0    8081
6.0    6999
7.0    5653
8.0    5139
9.0    4210
```

END

Exogenous Inputs

Name: ex1
Experiment: tracer
Input to: q1

Type	Input	Constant	Start	Stop	Interval	Number
Bolus	1.0400e+008	-	0.0000e+000	-	-	-

Change Conditions

No Change Conditions

General Model Information

Compartment Numbers in Model: 1, 2

No Delays

Experiments:

Name	Type	Suffix
tracer	Exogenous	-

Parameter Values

Parameter	Type	Prior Value	New Value	Lower Limit	Upper Limit
k(0,1)	Adj	1.000e-001	1.000e-001	1.000e-002	1.000e+000
k(1,2)	Adj	1.000e-001	1.000e-001	1.000e-002	1.000e+000
k(2,1)	Adj	1.000e-001	1.000e-001	1.000e-002	1.000e+000
vol	Adj	2.000e+003	2.000e+003	2.000e+002	2.000e+004

Values at t = 0.0 days

ex1.bolus	1.040000e+008
ex1.infusion	0.000000
flux(0,1)	1.040000e+007
flux(1,2)	0.000000
flux(2,1)	1.040000e+007
k(0,1)	0.100000
k(1,2)	0.100000
k(2,1)	0.100000
plasma	-
q1	1.040000e+008
q2	0.000000

```
s1                 52000.000000
s1_res                    -
s1_wres                   -
t                     0.000000
vol                2000.000000
------------------------------------------------------------------------

Calculated Sample Values and Data


          t       plasma       Weight           s1      s1_wres
 0.000e+000            -            -      5.200e+004         -
 7.000e-003   4.678e+004            -      5.193e+004         -
 4.200e-002   4.352e+004            -      5.157e+004         -
 1.250e-001   4.254e+004            -      5.072e+004         -
 2.500e-001   4.013e+004            -      4.948e+004         -
 3.750e-001   3.622e+004            -      4.828e+004         -
 5.000e-001   3.556e+004            -      4.711e+004         -
 7.500e-001            -            -      4.489e+004         -
 1.000e+000   2.819e+004            -      4.279e+004         -
 1.450e+000            -            -      3.934e+004         -
 1.725e+000            -            -      3.741e+004         -
 2.000e+000   1.957e+004            -      3.561e+004         -
 2.450e+000            -            -      3.290e+004         -
 2.725e+000            -            -      3.139e+004         -
 3.000e+000   1.440e+004            -      2.997e+004         -
 3.450e+000            -            -      2.785e+004         -
 3.725e+000            -            -      2.666e+004         -
 4.000e+000   1.128e+004            -      2.554e+004         -
 4.450e+000            -            -      2.386e+004         -
 4.725e+000            -            -      2.292e+004         -
 5.000e+000   8.081e+003            -      2.204e+004         -
 5.450e+000            -            -      2.070e+004         -
 5.725e+000            -            -      1.996e+004         -
 6.000e+000   6.999e+003            -      1.925e+004         -
 6.450e+000            -            -      1.819e+004         -
 6.725e+000            -            -      1.759e+004         -
 7.000e+000   5.653e+003            -      1.702e+004         -
 7.450e+000            -            -      1.616e+004         -
 7.725e+000            -            -      1.568e+004         -
 8.000e+000   5.139e+003            -      1.522e+004         -
 8.450e+000            -            -      1.453e+004         -
 8.725e+000            -            -      1.413e+004         -
 9.000e+000            -            -      1.376e+004         -
 9.000e+000   4.210e+003            -      1.376e+004         -
------------------------------------------------------------------------

Statistics

No Statistics after a Solve
------------------------------------------------------------------------

Notes

None
------------------------------------------------------------------------
```

This file contains all of the information contained in the “Detailed” option plus additional information. The model equations (that appear in the **Equations Read-**

Only window) are included. The data are also included as is information about the input and model (number of compartments).

c. Close the text file, and return to **study_0**.

6. Fit the model, and view the text file created.

a. In the **Compute** menu, click **Fit**, or alternatively, on the **SAAM II Toolbar** click **Fit**  .

b. Go to the folder where **study_0** is located. In this folder, you will find a file entitled **study_0.txt**. and **study_0_01.txt**

The file **study_0_01** contains the information following the Fit. Each time you solve or fit, you will produce a file with a number such as "01" after it. If you are doing this several times, it is useful to keep track of the number using Notes.

The contents of **study_0_01** are shown below.

```
Study Name:  study_0.stu
Model and Detailed Summary Output
Date:  08:08 AM, Tuesday, January 17, 2011
Application:  Compartmental
Type of Calculation:  Fit
-------------------------------------------------------------------------

Computational Settings

Number of Calculation Intervals:  20
Integrator:  Rosenbrock
Relative Integrator Error:  1.0000e-003
Maximum Number of Iterations: 20
Variance Model:  Data, Relative
Derivative:  Forward
-------------------------------------------------------------------------

Experiment Attributes

Independent Variable: t (days)
Start of Experiment: 0.0000e+000
End of Experiment:   9.0000e+000
-------------------------------------------------------------------------

Model Equations
```

```
flux(1,2) = k(1,2) * q2
flux(2,1) = k(2,1) * q1
flux(0,1) = k(0,1) * q1
ex1.bolus = 0.0
ex1.infusion = 0.0
s1 = q1/vol
q1' = + k(1,2)*q2 - k(2,1)*q1 - k(0,1)*q1 + ex1
q2' = - k(1,2)*q2 + k(2,1)*q1
```

Data

```
DATA
(FSD 0.1)
t      plasma
0.007  46780
0.042  43522
0.125  42535
0.25   40125
0.375  36221
0.5    35562
1.0    28194
2.0    19573
3.0    14403
4.0    11278
5.0    8081
6.0    6999
7.0    5653
8.0    5139
9.0    4210
END
```

Exogenous Inputs

Name: ex1
Experiment: tracer
Input to: q1

Type	Input	Constant	Start	Stop	Interval	Number
Bolus	1.0400e+008	-	0.0000e+000	-	-	-

Change Conditions

No Change Conditions

General Model Information

Compartment Numbers in Model: 1, 2

No Delays

Experiments:

Name	Type	Suffix
tracer	Exogenous	-

Parameter Values

Parameter	Type	Prior Value	New Value	Lower Limit	Upper Limit
k(0,1)	Adj	1.000e-001	2.923e-001	1.000e-002	1.000e+000
k(1,2)	Adj	1.000e-001	2.831e-001	1.000e-002	1.000e+000
k(2,1)	Adj	1.000e-001	1.745e-001	1.000e-002	1.000e+000
vol	Adj	2.000e+003	2.324e+003	2.000e+002	2.000e+004

Values at t = 0.0 days

ex1.bolus	1.040000e+008
ex1.infusion	0.000000
flux(0,1)	3.039597e+007
flux(1,2)	0.000000
flux(2,1)	1.814980e+007
k(0,1)	0.292269
k(1,2)	0.283108
k(2,1)	0.174517
plasma	-
q1	1.040000e+008
q2	0.000000
s1	44754.732253
s1_res	-
s1_wres	-
t	0.000000
vol	2323.776610

Calculated Sample Values and Data

t	plasma	Weight	s1	s1_wres
0.000e+000	-	-	4.475e+004	-
7.000e-003	4.678e+004	4.104e-007	4.461e+004	1.391e+000
4.200e-002	4.352e+004	4.741e-007	4.389e+004	-2.519e-001
1.250e-001	4.254e+004	4.964e-007	4.223e+004	2.117e-001
2.500e-001	4.013e+004	5.578e-007	3.989e+004	1.772e-001
3.750e-001	3.622e+004	6.845e-007	3.770e+004	-1.225e+000
5.000e-001	3.556e+004	7.101e-007	3.566e+004	-8.650e-002
7.500e-001	-	-	3.200e+004	-
1.000e+000	2.819e+004	1.130e-006	2.880e+004	-6.469e-001
1.450e+000	-	-	2.405e+004	-
1.725e+000	-	-	2.166e+004	-
2.000e+000	1.957e+004	2.344e-006	1.960e+004	-4.317e-002
2.450e+000	-	-	1.680e+004	-
2.725e+000	-	-	1.537e+004	-
3.000e+000	1.440e+004	4.329e-006	1.412e+004	5.867e-001
3.450e+000	-	-	1.240e+004	-
3.725e+000	-	-	1.151e+004	-
4.000e+000	1.128e+004	7.061e-006	1.072e+004	1.494e+000
4.450e+000	-	-	9.603e+003	-
4.725e+000	-	-	9.016e+003	-

```
 5.000e+000   8.081e+003   1.375e-005   8.487e+003  -1.507e+000
 5.450e+000         -            -      7.728e+003         -
 5.725e+000         -            -      7.319e+003         -
 6.000e+000   6.999e+003   1.833e-005   6.944e+003   2.355e-001
 6.450e+000         -            -      6.395e+003         -
 6.725e+000         -            -      6.093e+003         -
 7.000e+000   5.653e+003   2.810e-005   5.813e+003  -8.504e-001
 7.450e+000         -            -      5.396e+003         -
 7.725e+000         -            -      5.162e+003         -
 8.000e+000   5.139e+003   3.401e-005   4.943e+003   1.142e+000
 8.450e+000         -            -      4.612e+003         -
 8.725e+000         -            -      4.424e+003         -
 9.000e+000         -            -      4.246e+003         -
 9.000e+000   4.210e+003   5.067e-005   4.246e+003  -2.582e-001
-------------------------------------------------------------------------

Statistics

Parameter/Variable     Value     Std.Dev. Coef. of Var.   95% Confidence Interval
-----------------   -------    -------- -------------   -----------------------
k(0,1)              0.29227  1.46155e-002  5.00071e+000     0.26010     0.32444
k(1,2)              0.28311  7.51183e-002  2.65335e+001     0.11777     0.44844
k(2,1)              0.17452  1.82636e-002  1.04652e+001     0.13432     0.21472
vol              2323.77661  3.85619e+001  1.65945e+000   2238.90219   2408.65103

                              Objective      Scaled Data Variance
s1 : plasma                1.336743e+001       1.113515e-001
                          --------------
Total objective            1.336743e+001

AIC                        7.935987e+000
BIC                        8.053995e+000

Number of Iterations Required to Fit: 5
-------------------------------------------------------------------------
Notes

None
-------------------------------------------------------------------------
```

The information parallels that following the Solve except now information on the Fit is available. This includes the weights and weighted residuals, and the information from the **Statistics** window. It also includes the number of iterations required to Fit the data.

c. Close the text file and return to **study_0**.

This information can be cut from the text window and pasted into another application for you to prepare your report.

Quit the **SAAM II Compartmental** application. Do not save the changes to **study_0**.