



Science For A Better Life

Presenting SAS[®] Data Sets

On the Web

Using SAS[®] ODS, JavaScript, and jQuery

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Agenda

- Inspiration: The ODS tableeditor tagset
- Web Page Basics
- Tables with Web Tools and with SAS ODS
- Conclusion and Outlook



Recently in our Department

Data set

- 1314 reference intervals interval
- Different parameters
- Seven different laboratory tests
- Measurements for male and female animals
- Made to compare three different blood sampling technique

Problem

- List report unfeasible

Idea

- Present results via the SAS Stored Process Application
- Give the SAS tableeditor tagset a try

It worked!: The Program

```
* provide the tableeditor tagset;
ods path(prepend) work.templat(update);
%include "&ProjDir.\tableeditor.tpl";

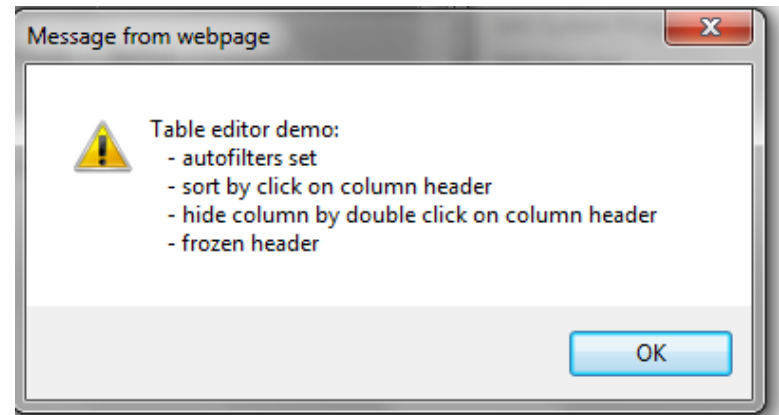
* provide the data;
libname der "&ProjDir.";

* open the ods destination;
ods tagsets.tableeditor file =
"&ProjDir.\ReferenceIntervals.html"
  options (
    autofilter="yes"
    autofilter_width = "8em"
    autofilter_endcol = "5"
    frozen_headers = "yes"
    sort = "yes"
    hide_cols = "yes"
    alert_text = "Table editor demo:
\n  - autofilters set
\n  - sort by click on column header
\n  - hide column by double click on column header
\n  - frozen header"
  );

* report the data;
title1 "Reference Intervals";

proc print data = der.ReferenceIntervals label noobs;
run;

* close the ods destination;
ods tagsets.tableeditor close;
```



It worked!: The Output

Refresh

Reference Intervals

Test	Parameter abbreviation	Blood Sampling Technique	Sex	Day of phase	N	Mean	Unit	SD	Min	Max	Lower bound	Upper bound	Distribution
(all)	(all)	(all)	(all)	(all)									
test1	ParmX	1	F	30	20	1.48		0.10	1.34	1.69	1.36	1.62	nonnormal
test2	ParmX	1	F	100	20	1.52		0.12	1.26	1.69	1.37	1.67	nonnormal
test3	ParmX	1	M	30	20	1.18		0.11	1.04	1.39	1.04	1.37	nonnormal
test4	ParmX	1	M	100	20	1.14		0.11	0.92	1.32	0.92	1.25	nonnormal
test5	ParmX	1	M	184	20	1.11		0.07	0.95	1.24	1.03	1.23	nonnormal
test6	ParmX	2	F	30	20	1.51		0.13	1.17	1.76	1.36	1.69	nonnormal
test7	ParmX	2	F	100	20	1.48		0.12	1.31	1.78	1.33	1.67	nonnormal
Test2	ParmX	2	F	184	20	1.51		0.17	0.98	1.74	1.34	1.73	nonnormal
Test2	ParmX	2	M	30	20	1.12		0.10	1.00	1.34	1.02	1.30	nonnormal
Test2	ParmX	2	M	100	20	1.09		0.08	0.95	1.29	0.99	1.23	nonnormal
Test2	ParmX	2	M	184	20	1.07		0.07	0.91	1.18	0.91	1.17	nonnormal
Test2	ParmX	3	F	30	20	1.48		0.10	1.28	1.72	1.32	1.60	nonnormal
Test2	ParmX	3	F	100	20	1.45		0.11	1.24	1.62	1.27	1.59	nonnormal
Test2	ParmX	3	M	30	20	1.14		0.10	0.80	1.29	1.06	1.29	nonnormal
Test2	ParmY	1	F	30	20	24.44	%	0.73	22.90	25.90	22.74	26.14	normal
Test2	ParmY	1	F	100	20	23.28	%	1.20	21.50	25.60	20.49	26.06	normal
Test2	ParmY	1	M	30	20	27.99	%	1.42	25.30	30.40	24.70	31.28	normal
Test2	ParmY	1	M	100	20	27.64	%	0.99	25.70	29.50	25.34	29.94	normal
Test2	ParmY	1	M	184	20	27.83	%	0.97	26.30	30.30	25.59	30.07	normal
Test2	ParmY	2	F	30	20	24.11	%	1.09	22.30	25.80	21.58	26.63	normal
Test2	ParmY	2	F	100	20	23.57	%	1.27	20.70	26.40	20.63	26.51	normal

But: Tagsets are not easily understood and modified.

So I decided to do some research how data sets can be presented on the web.

Web Page Basics

Structure

- A web page is build up by HTML elements that have attributes and content
- Most HTML elements are written with a start tag and an end tag, with the content in between.
- Syntax: `<tag attribute="value">(content to be modified by the tag)</tag>`

Presentation

- Cascading style sheets determine the presentation of HTML element.
- Selectors are used to declare which part of the markup a style applies to
- Syntax: `selector {property1: value; ...; propertyN: value}`

Behaviour

- The web browser builds up a Document Object Model (DOM) from the HTML elements, listens to events, and provides JavaScript to access the DOM.

Simple Web Page: Structure

What you write

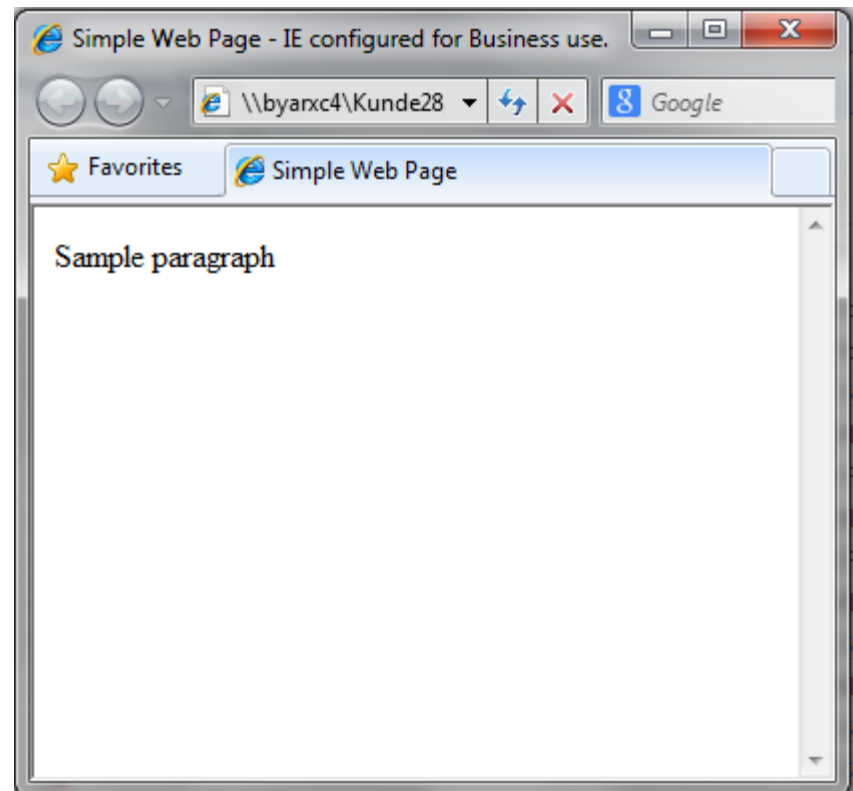
```
<html>

  <head>
    <title>
      Simple Web Page
    </title>
  </head>

  <body>
    <p>
      Sample paragraph
    </p>
  </body>

</html>
```

What the browser creates



Simple Web Page: Adding Style

What you write

```
<html>
  <head>

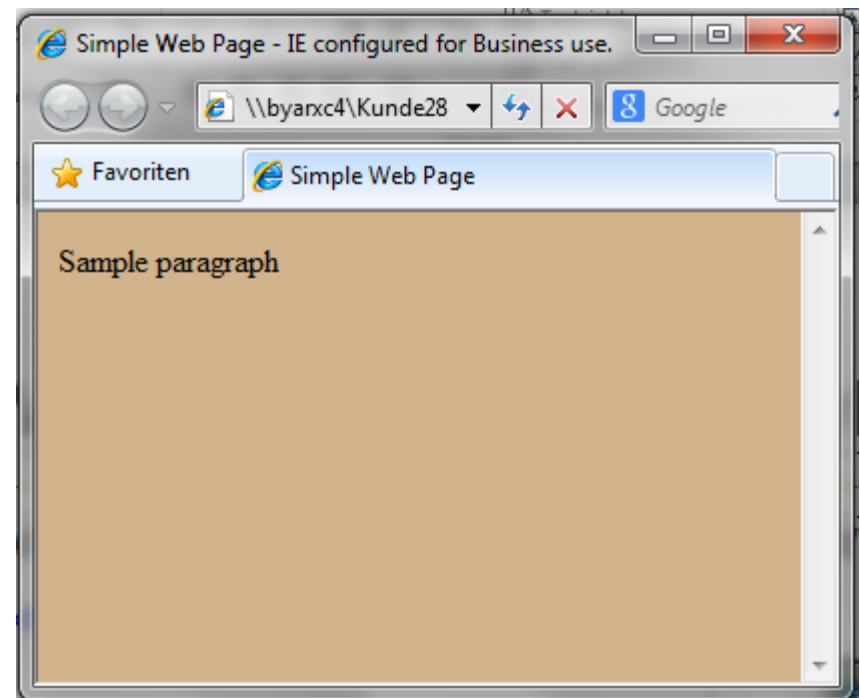
    <title>Simple Web Page</title>

    <style type="text/css">
      body {
        background-color: #d2b48c;
      }
    </style>

  </head>

  <body>
    <p> Sample paragraph</p>
  </body>
</html>
```

What the browser creates



Simple Web Page: Adding Behaviour

What you write

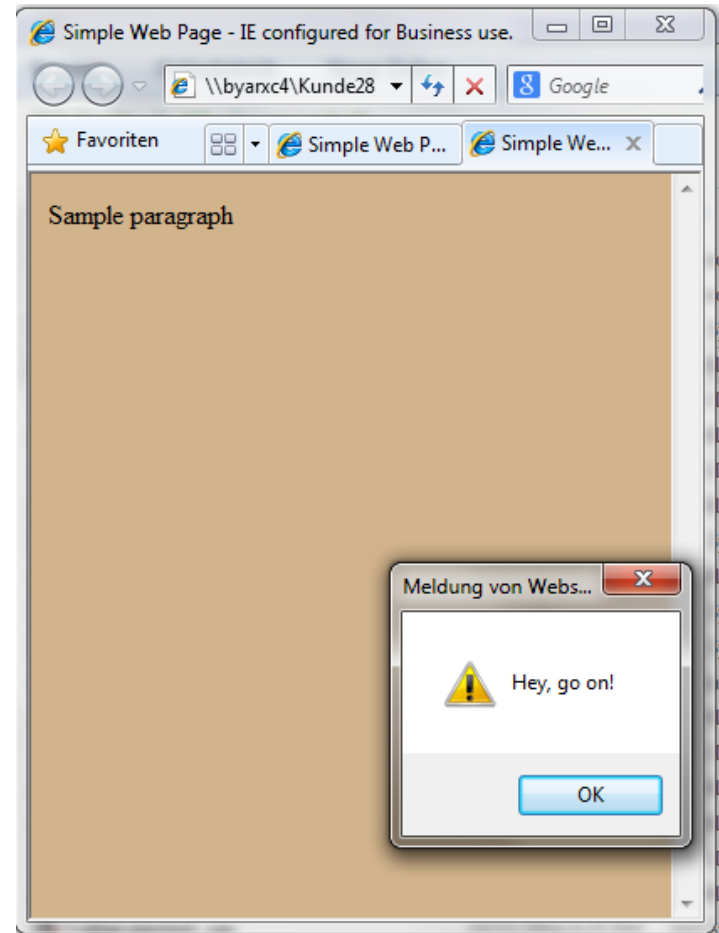
```
<html>
  <head>
    <title>Simple Web Page</title>
    <style type="text/css">
      body {
        background-color: #d2b48c;
      }
    </style>

    <script>
      setTimeout(wakeUpUser, 5000);
      function wakeUpUser() {
        alert("Hey, go on!");
      }
    </script>

  </head>

  <body>
    <p>Sample paragraph</p>
  </body>
</html>
```

What the browser creates

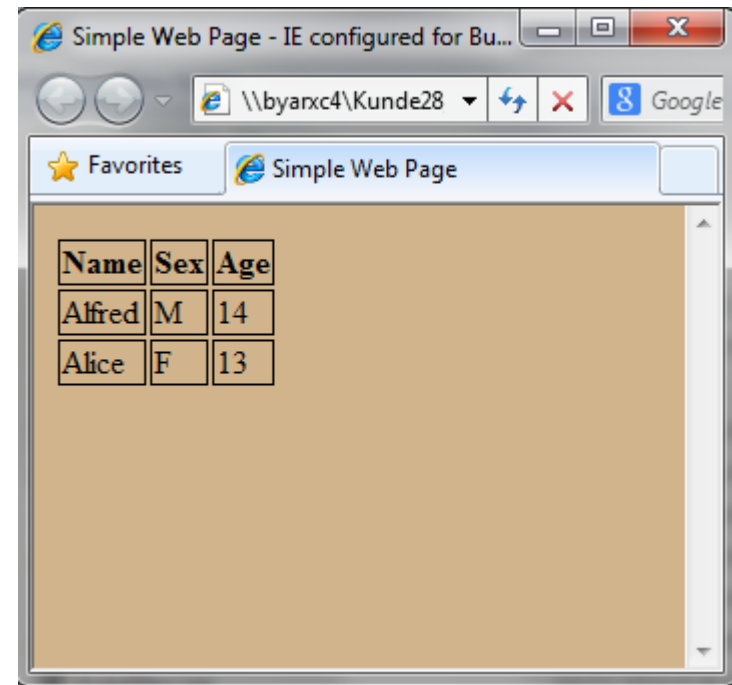


Simple Web Page: Create a Table

What you write

```
<html>
  <head>
    <title>Simple Web Page</title>
    <style type="text/css">
      td, th {border: 1px solid black}
      body {background-color: #d2b48c;}
    </style>
  </head>
  <body>
    <table>
      <thead>
        <tr>
          <th>Name</th>
          <th>Sex</th>
          <th>Age</th>
        </tr>
      </thead>
      <tbody>
        <tr>
          <td>Alfred</td>
          <td>M</td>
          <td>14</td>
        </tr>
        <tr>
          <td>Alice</td>
          <td>F</td>
          <td>13</td>
        </tr>
      </tbody>
    </table>
  </body>
</html>
```

What the browser creates



Using SAS ODS: Create a table

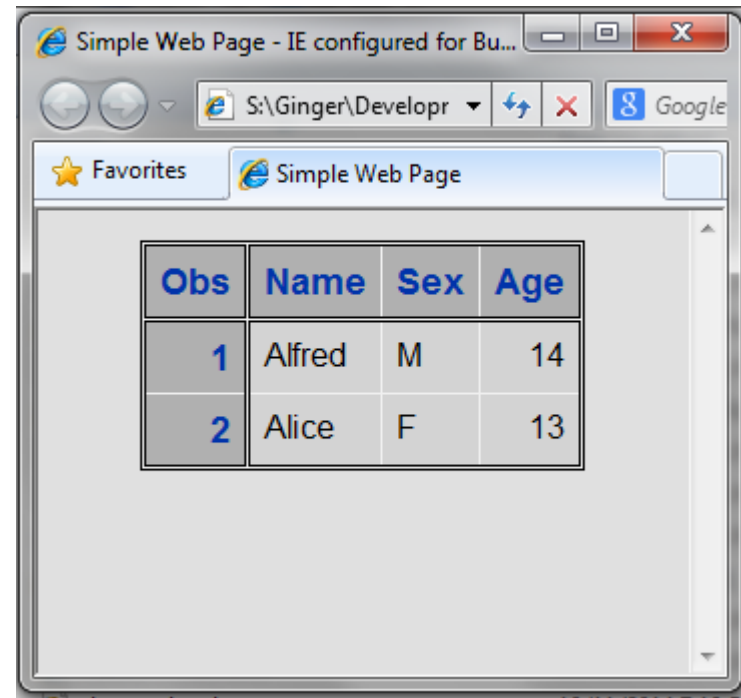
What you write

```
* creating the table;
data SampleTable;
  set sashelp.class
      (obs = 2 keep = Name Sex Age);
run;

* rendering the table;
ods html body =
  "&WorkDir.\SampleTable.html"
  (title = 'Simple Web Page');

proc print data = SampleTable;
run;
ods html close;
```

What the browser creates



The screenshot shows an Internet Explorer browser window titled "Simple Web Page - IE configured for Bu...". The address bar shows the file path "S:\Ginger\Developr". The page content displays a table with the following data:

Obs	Name	Sex	Age
1	Alfred	M	14
2	Alice	F	13

Using SAS ODS: Structure of the Web Page Produced



```
<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN">
<html>

  <head>
    <meta name="Generator" content="SAS Software Version 9.2, see www.sas.com">
    <meta http-equiv="Content-type" content="text/html; charset=windows-1252">
    <title>Simple Web Page</title>
    <style type="text/css">
      // CSS style definitions here
    </style>
    <script language="javascript" type="text/javascript">
      // JavaScript statements in header
    </script>
  </head>

  <body onload="startup()" onunload="shutdown()" class="Body">
    // HTML Elements
    <script language="javascript" type="text/javascript">
      // JavaScript statements for build up DOM
    </script>
  </body>

</html>
```



Using SAS ODS: HTML for the Table

```
<div class="branch">
<table class="Table" cellspacing="1" cellpadding="7" rules="groups" frame="box"
border="1" bordercolor="#000000" summary="Procedure Print: Data Set WORK.SAMPLETABLE">
  <colgroup><col></colgroup>
  <colgroup>
    <col>
    <col>
    <col>
  </colgroup>
  <thead>
    <tr>
      <th class="r Header" scope="col">Obs</th>
      <th class="l Header" scope="col">Name</th>
      <th class="l Header" scope="col">Sex</th>
      <th class="r Header" scope="col">Age</th>
    </tr>
  </thead>
  <tbody>
    <tr>
      <th class="r RowHeader" scope="row">1</th>
      <td class="l Data">Alfred</td>
      <td class="l Data">M</td>
      <td class="r Data">14</td>
    </tr>
    <tr>
      <th class="r RowHeader" scope="row">2</th>
      <td class="l Data">Alice</td>
      <td class="l Data">F</td>
      <td class="r Data">13</td>
    </tr>
  </tbody>
</table>
```

Note: There are suboptions `no_top_matter` and `no_bottom_matter` that can be used to generate this part of HTML output.

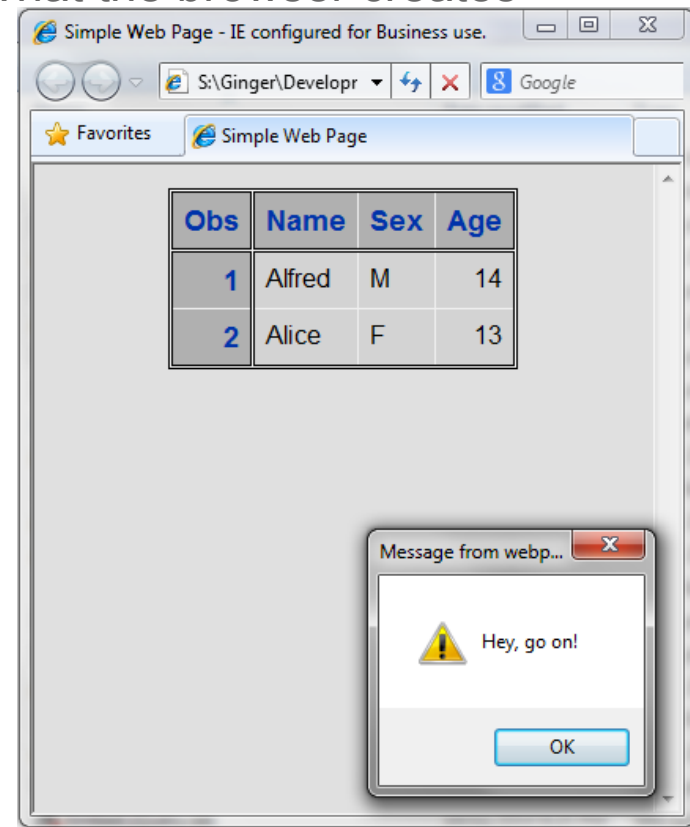
Using SAS ODS: Adding Behaviour

What you write

```
* using the headtext option;
ods html
  body = "&ProjDir.\ODSHeadtext.html"
  (title = 'Simple Web Page')
  headtext =
    '<script>
      setTimeout(wakeUpUser, 5000);
      function wakeUpUser() {
        alert("Hey, go on!");
      }
    </script>';

proc print data = SampleTable;
run;
ods html close;
```

What the browser creates



Note: The script part is inserted into the header tag of the HTML file;

Simple Web Page: Make a Table Sortable with jQuery plugin Tablesorter



What you write

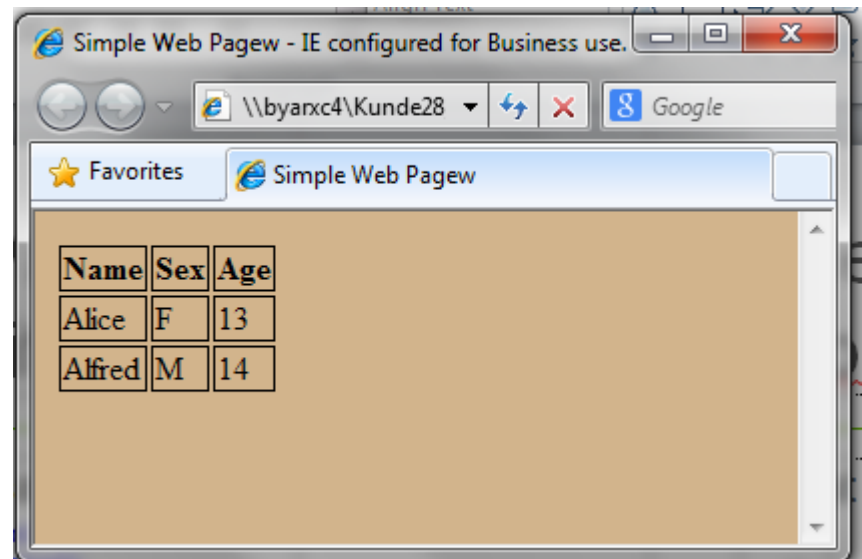
```
<html>
<head>
  <title>Simple Web Pagew</title>
  <style type="text/css">
    td, th {border: 1px solid black}
    body {background-color: #d2b48c;}
  </style>
  <script
    type="text/javascript"
    src="js/jquery-1.10.2.min.js">
  </script>
  <script
    type="text/javascript"
    src="js/jquery.tablesorter.min.js">
  </script>
</head>
<body>
  <table>
    //statements as above
  </table>

  <script type="text/javascript">
    $(function() {
      $('table').tablesorter();
    });
  </script>

</body>
</html>
```

What the browser creates

- After double clicking on column "Name"



Using SAS ODS: Make a Table Sortable with jQuery plugin Tablesorter



What you write

```
* using proc template;
ods path (prepend) work.mystyle(update);
proc template;
  define style mystyle;
    parent = styles.default;
    style body from body/
    prehtml =
      '<script
        type="text/javascript"
        src="js/jquery-1.10.2.min.js">
      </script>
      <script
        type="text/javascript"
        src="js/jquery.tablesorter.min.js">
      </script>'

    posthtml =
      '<script type="text/javascript">
        $(function() {
          $("table").tablesorter();
        });
      </script>';
  end;
run;
ods html body = "&WorkDir.\ODSTablesorter.html" style =
mystyle;
proc print data = SampleTable noobs;
run;
ods html close;
```

What the browser creates

- After double clicking on column "Name"

A screenshot of a web browser window titled "SAS Output - IE configured for Busin...". The address bar shows "S:\Ginger\Developr". The browser displays a table with three columns: "Name", "Sex", and "Age". The table contains two rows of data: "Alice" (F, 13) and "Alfred" (M, 14). The "Name" column is highlighted with a blue background, indicating it is the selected column for sorting.

Name	Sex	Age
Alice	F	13
Alfred	M	14



Conclusion and Outlook

First steps into web development

Ways to insert JavaScript into SAS ODS HTML output

- HEADTEXT
- ODS style definition
- ODS tagset
 - Maybe reconsidering the tableeditor tagset with broadened knowledge

First successful initialization of a jQuery plugin gives the way for the vast amount of further plugins of the web developer community

The jQuery datatables plugin will be the next step.



Science For A Better Life

Thank you!