

# *Black Box Software Testing*

## *(Professional Seminar)*

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### **Section:26**

### **Relationship Tables**

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# Tabular Format for Data Relationships

**- TSTimer -**

File Edit Slips Names Search Special Help

New slip ◆ All ◇ Find

◆ Time Slip ◇ Expense Slip Value **\$4,475.30**

Consultant	Cem Kaner	▶	1	1 2
Client	softGear Tech	▶	1	1 2
Activity	Research	▶	13	1 2

Description  
Researched the Win 95 documentation

Reference

Start Date **5/4/96** ▶ Time estimated 0:00:00 ▶

End Date 5/3/96 ▶ Time spent 1:40:00 ▶

Billing Status Billable  Repeat  Add to Flat Fee

Rate Client 1 ▶ 2685.18 (hourly)  Override

Active slips 0

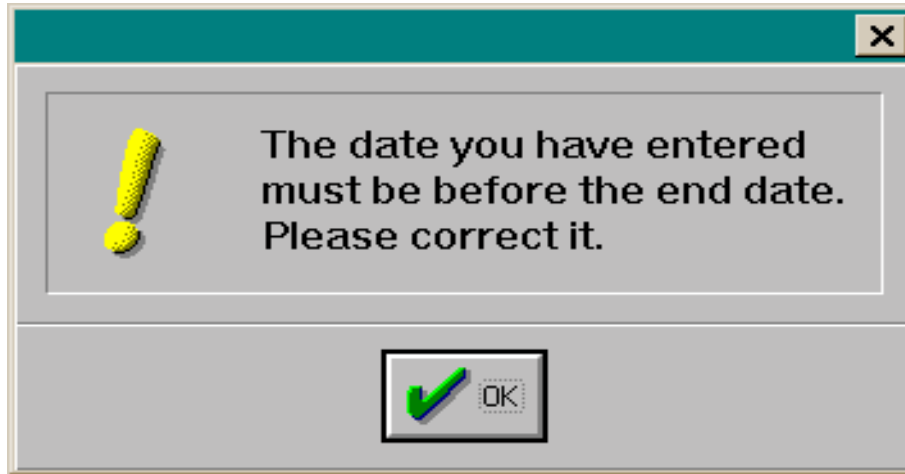
Prev Next Go To New Save Revert

# *Tabular Format for Data Relationships*

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- Look at this record, from the Timeslips Deluxe time and billing database. In this dialog box, click the arrow next to the Consultant field to edit the Consultant record (my name, billing info, etc.) or enter a new one.
- If I edit it here, will the changes carry over to every other display of this Consultant record?
- Also, note that the End Date for this task is before the Start Date. That's not possible.

# *Tabular Format for Data Relationships*



**The program checks the End Date against the Start Date and rejects this pair as impossible because the task can't end before it starts.**

*The value of End Date is constrained by Start Date, because End Date can't be earlier than Start Date.*

*The value of Start Date constrains End Date, because End Date can't be earlier than Start Date.*

# *A Tabular Format for Data Relationships*

<i>Field</i>	<i>Entry Source</i>	<i>Display</i>	<i>Print</i>	<i>Related Variable</i>	<i>Relationship</i>
Start Date				End Date	Constraint to a range
End Date				Start Date	Constraint to a range

## *Tabular Format for Data Relationships*

Once you identify two variables that are related, test them together using boundary values of each or pairs of values that will trigger some other boundary.

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- **This is not the most powerful process for looking at relationships. An approach like Cause-Effect Graphing is more powerful, if you have or can build a complete specification.**
- **I started using this chart as an *exploratory* tool for simplifying my look at relationships in overwhelmingly complex programs. (There doesn't have to be a lot of complexity to be "overwhelming.")**

# *Tabular Format for Data Relationships*

## **THE TABLE'S FIELDS**

- Field: *Create a row for each field (Consultant, End Date, and Start Date are examples of fields.)*
- Entry Source: *What dialog boxes can you use to enter data into this field? Can you import data into this field? Can data be calculated into this field? List every way to fill the field -- every screen, etc.*
- Display: *List every dialog box, error message window, etc., that can display the value of this field. When you re-enter a value into this field, will the new entry show up in each screen that displays the field? (Not always -- sometimes the program makes local copies of variables and fails to update them.)*
- Print: *List all the reports that print the value of this field (and any other functions that print the value).*
- Related to: *List every variable that is related to this variable. (What if you enter a legal value into this variable, then change the value of a constraining variable to something that is incompatible with this variable's value?)*
- Relationship: *Identify the relationship to the related variable.*

# *Tabular Format for Data Relationships*

**Many relationships among data:**

- **Independence**
  - » **Varying one has no effect on the value or permissible values of the other.**
- **Causal determination**
  - » **By changing the value of one, we determine the value of the other.**
  - » **For example, in MS Word, the extent of shading of an area depends on the object selected. The shading differs depending on Table vs. Paragraph.**
- **Constrained to a range**
  - » **For example, the width of a line must be less than the width of the page.**
  - » **In a date field, the permissible dates are determined by the month (and the year, if February).**
- **Selection of rules**
  - » **Example, hyphenation rules depend on the language you choose.**

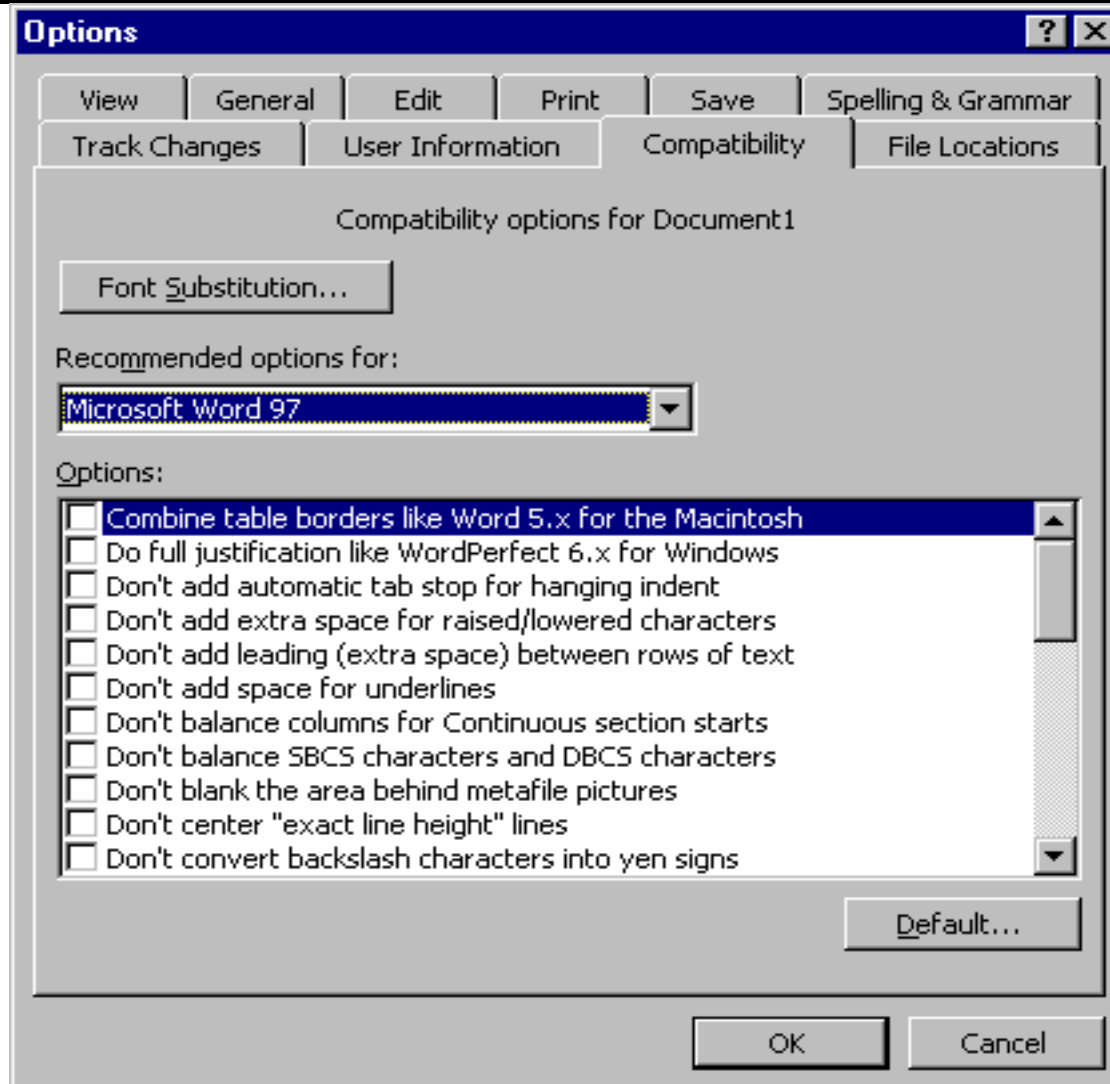
# *Tabular Format for Data Relationships*

**Many relationships among data:**

- **Logical selection from a list**
  - » **processes the value you entered and then figures out what value to use for the next variable. Example: timeouts in phone dialing:**
    - *0 on complete call 555-1212 but 95551212?*
    - *10 on ambiguous completion, 955-5121*
    - *30 seconds incomplete 555-121*
- **Logical selection of a list:**
  - » **For example, in printer setup, choose:**
    - *OfficeJet, get Graphics Quality, Paper Type, and Color Options*
    - *LaserJet 4, get Economode, Resolution, and Half-toning.*

Look at Marick (*Craft of Software Testing*) for discussion of catalogs of tests for data relationships.

# *Complex Data Relationships*



# *Data Relationship Table*

Looking at the Word options, you see the real value of the data relationships table. Many of these options have a lot of repercussions.

You might analyze all of the details of all of the relationships later, but for now, it is challenging just to find out what all the relationships ARE.

The table guides exploration and will surface a lot of bugs.

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## **PROBLEM**

**Works great for this release. Next release, what is your support for more exploration?**

