Coding Tricks to Save Resources

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Problem Statement – Increasing survey complexity

- Initially people were simply counted – census
- Middle of 1900's counting was extended
  - Data collection tried to document public opinion
  - Data collection expanded to cover behaviors and elements of interest to social science

Surveys develop

- Complex paper forms
  - Difficult to follow skip patterns
  - Easy to neglect questions/sections
- Computer Aided Interviewing
  - Allowed data collection to be customized
  - Programmed logic prevented errors in flow
  - More accurate data resulted

So – Survey applications were developed to handle increased demands, then demands increased, creating a never ending circle.

Data Accuracy

- Experiments in methodology have increased looking for ways to ensure the data quality and accuracy.
- What can be done to help respondents remember more correctly?
- These experiments push the limits of the application software collecting data

SHIPP

- Survey of Health Insurance and Program Participation
- Census Bureau Project
- Health insurance coverage of household members
- Survey design, experiment
  - Interview one respondent about entire household
  - Collect same data 3 different ways
  - 2 currently implemented methods of collection
  - 1 experimental method for collection
  - Each household answered questions only once

Experimental Method

- Repeated sections of code (6 total)
- Maintain data flags of insurance type by person

- Problems included
  - Excessive number of variables and calculations
  - Flow based on global counters
  - Repeated code
  - Complex logic

Number of variables

- Data collected by month for 17 months
- 14 different types of insurance coverage
- Data collected for each household member

- 16 HH * 14 Types* 17 Months = 3808 “flag” variables

Reduce Variables

- Created a string variable for each person for each type
- Added 1 additional type
- 16 HH * 15 types = 240 “flag” variables

- Each string has 17 columns, one column for each month
- Typexx(i) := ‘NNNNNNNNNNNNNNNNN’
- Master(i) := ‘NNNNNNNNNNNNNNNNN’

Type 1(3) = ‘NYYYNNNNNNNNYNNNN’

Type 4(3) = ‘NNNNNNYYYYNNNNNNN’

Master(3) = ‘NYYYNNYYYYNNYNNNN’

- Start first column with January – string covers Jan thru May of following year data collection done in Jan of second year
- Example shows coverage Feb, Mar, Apr, July, Aug, Sept, Oct, Jan
- No coverage May, June, Nov, Dec

Code problems

- Complicated logic collected data for each person
- Asked about which type applied to a single person
- Asked who else was also covered the same way
- Accounted for difference in coverage periods of HH members
- Questions repeated based on who was all ready included in previous round of questions and who owned the policy
- Involved global values that changed dynamically as the data was collected

During development -- experimental section was only a quarter coded, but file contained of 15,000 lines

MUST……..

- Reduce code file
- Reduce complexity

Coding Solutions

- Created 2 major blocks that could be repeated
- Reduced number of variables with innovative string variable
- Created series of procedures to set string variable
  - String variables were set and updated as data was collected
  - Procedure 1 called to set string for range of dates
  - Procedure 2 called by procedure one to set the columns one at a time

Flow Issues

- Flow was controlled by global variables
- Value of global variables increased as data was collected
- Change in global variable would change flow if uncontrolled

- Controlled path changes by using
- If … ASK
- Else KEEP format for the blocks of code and the sections that set the string variables.

Summary

- Decrease number of variables – used string variable that acted as a collection of variables
- Reduce code
  - Used blocks
  - Used procedures
- Maintain global variables to control the path
  - Reduced respondent burden
  - Solution prevented backup during interview

More Information

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