

## Finding Cycles example in SAS

This example imports an Excel file with World Series and Super Bowl data. A graph is created by using the variables winner and loser for the two title games. A directed edge exists between two teams,  $u$  and  $v$ , if and only if  $u$  beat  $v$  in the title game. World Series data goes back to 1903. Super Bowl data only goes back to 1967. When creating the SuperBowl graph you must restrict the graph to the first 51 observations in the file. Otherwise Proc Optgraph stops when trying to create a vertex from an empty observation.

```
/* Generated Code (IMPORT) */
/* Source File: baseball ws clean.xlsx */
/* Source Path: /gpfs/user_home/jdemaio/Baseball Avg Age */
/* Code generated on: 1/29/18, 1:15 PM */

%web_drop_table(WORK.IMPORT);

FILENAME REFFILE '/gpfs/user_home/jdemaio/Baseball Avg Age/baseball ws
clean.xlsx';

PROC IMPORT DATAFILE=REFFILE
    DBMS=XLSX
    OUT=WORK.IMPORT;
    GETNAMES=YES;
RUN;

PROC print DATA=WORK.IMPORT (obs=10); RUN;

/* generate all cycles in World Series data with 16 <= length <= 37 */
proc optgraph
loglevel = moderate
graph_direction = directed
data_links = WORK.IMPORT;
    data_links_var
from = ws_winner
to = ws_loser;
cycle
minLength = 16
maxLength = 37
out = WS_directed_Cycles
mode = all_cycles;
run;

/* generate all cycles in SuperBowl data with 3 <= length <= 37 */
proc optgraph
loglevel = moderate
graph_direction = directed
data_links = WORK.IMPORT (obs=51);
    data_links_var
from = sb_winner
to = sb_loser;
```

```
cycle
minLength = 3
maxLength = 37
out = SB_directed_Cycles
mode = all_cycles;
run;
```