

Do Which: Loop, Until or While

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30+ yrs exp., 40+ titles, 90+ papers

macro maven

senior maverick

memes: **cardinality ratio** **list processing**

papers: **companions:** autoexec, configuration,
sysparm

lp macros: **call-macro call-text date-loop**

expertise: **list processing** advanced data step

macros test-driven development

sql scl

Do Which: Loop, Until, or While?

A Review of Data Step and Macro Algorithms

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Outline

Algorithms

- Basic

- SAS extensions

Examples

- Compare boolean logic in while and until

- Whitlock subsetting loop

Fundamental loop algorithm

```
loop :
```

```
repeat : goto loop
```

Fundamental loop algorithm

loop :

test : if condition then goto done

repeat : goto loop

done :

Fundamental loop algorithm

loop :

test : if **condition** then goto done

iterate: assignment

repeat : goto loop

done :

Fundamental loop algorithm

```
loop      :  
          pre-test assignments  
test      : if condition then goto done  
          post-test assignments  
iterate:  assignment  
repeat   : goto loop  
done     :
```

SAS extensions to loop algorithm

basic iteration

```
assign :    index = value-1  
loop   : do index = 1 to last;  
test-1 : if index  gt last then goto done
```

assignment(s)

```
iterate: index = next value  
repeat : end; goto loop  
done   :
```


SAS extensions to loop algorithm

leave or continue

assign : index = value-1

loop : do ...;

pre-test assignment(s)

test-3 : if continue-cond then goto iterate

test-4 : if leave-cond then goto done

post-test assignment(s)

iterate: index = next value

repeat : end; goto loop

done :

SAS extensions to loop algorithm

while or until

assign : index

loop : do ...;

test-2 : if while-condition then goto done
assignment(s)

test-5 : if until-condition then goto done

iterate:

repeat : end; goto loop

done :

Comparison of logic

while

```
data test1;  
do          EOF?  
  *if EOF leave;  
  set x end = EOF ;  
  output;  
  
end;
```

until

```
data test2;  
do          EOF?  
  set x end = EOF ;  
  output;  
  *if EOF leave;  
end;
```

Comparison of logic

while

```
data test1;  
do          EOF?  
  *if EOF leave;  
  set x end = EOF ;  
  output;  
  
end;
```

until

```
data test2;  
do until(   EOF);  
  
  set x end = EOF ;  
  output;  
  *if EOF leave;  
  
end;
```

Comparison of logic

while

```
data test1;  
do while(not EOF);  
  
    set x end = EOF ;  
    output;  
  
end;
```

until

```
data test2;  
do until(EOF);  
  
    set x end = EOF ;  
    output;  
  
end;
```

Comparison of logic

while

```
* while not false;  
do while(not EOF);
```

```
set x end = EOF ;  
output;
```

```
end;
```

until

```
* until true;  
do until( EOF);
```

```
set x end = EOF ;  
output;
```

```
end;
```

The Do-Whitlock (DOW) loop

```
DATA do_Whitlock_last;  
do until(                               end_file);  
  do until(last.sex);  
    set class                               end = end_file;  
    by                               sex;  
  end;  
  output;  
  put sex= name=;  
end;  
stop; run;
```

The Do-Whitlock subset

```
Sex=F Name=Mary
```

```
Sex=M Name=William
```

```
NOTE: There were 19 observations read  
      from the data set WORK.CLASS.
```

```
NOTE: The data set WORK.DO_WHITLOCK_LAST  
      has 2 observations and 5 variables.
```


Conclusion

1. algorithms: using labels: loop, test+goto, repeat
do while(...)
do until(...)
2. logic: do while(not false)
do until(true)
do until(last.by_var) Whitlock

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