



Streaming Table & Listings by PROC STREAM

-Charumathy Sreeraman ;
Samundeeswari Raja



Introduction

- Increased Insistence on complete and extensive documentation of the clinical data
- Essential to prove the quality, safety, and efficacy of the new drug
- Clinical Study Report (CSR) – one of the most critical documents
- Summary tables and listings - Major components in CSR
- PROC STREAM procedure enables conversion of data to enable an interactive and dynamic data visualization

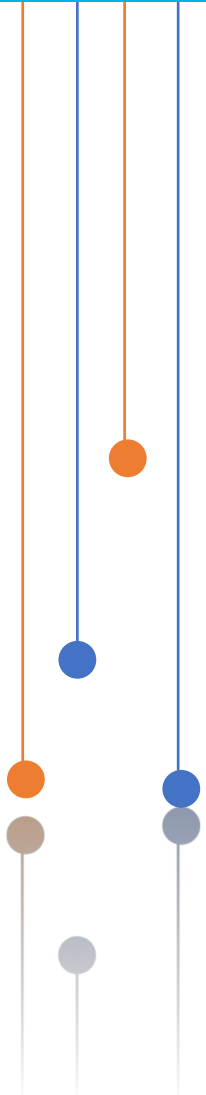
The STREAM Procedure - *Magic*

- Can process any input stream that consists of arbitrary text, not just SAS code
- Output stream - sent to an external file - can be defined to use any traditional SAS output destination
- RTF for Word documents
- HTML & XML file

Procedure Syntax

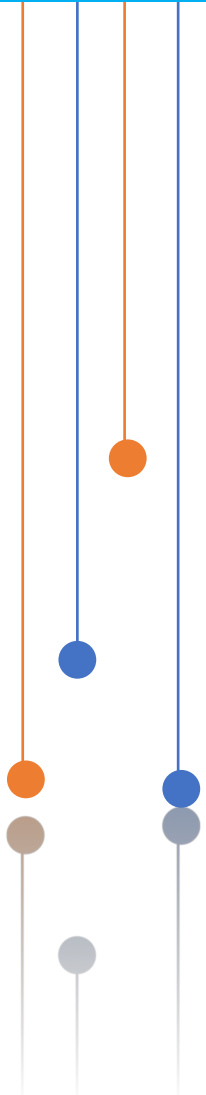
```
PROC STREAM OUTFILE= fileref <option(s)>;  
BEGIN  
  <text-1>  
  <text-n>  
  ; ; ; ;
```

PS: There is no “RUN” or “QUIT”



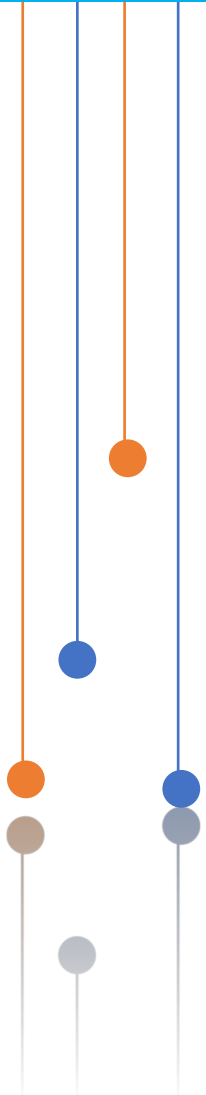
Basic Example

```
filename new 'mytable.html';
%macro make_table (nrows, ncols);
    <table>
        %do i=1 %to &nrows;
            <tr>
                %do j=1 %to &ncols;
                    <td>&j</td>
                %end;
            </tr>
        %end;
    </table>
%mend;
proc stream outfile=new; begin
    %make_table (5,3)
;;;;
```



Basic Example - Output

1 2 3
1 2 3
1 2 3
1 2 3
1 2 3

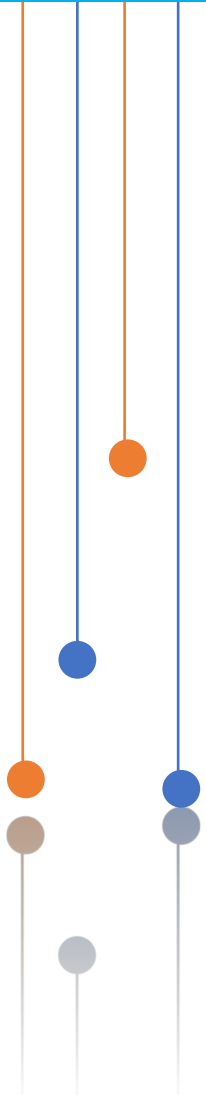


SAS Code to create HTML Output

```
Filename _webout "/path/aesocptsev.html";
proc stream outfile=_webout;
BEGIN
%global pagetitle data hierarchy vars statistic
<html>
    <head>
        <title>pageTitle</title>
    </head>
    <body>
    <body>
    %let rc = %sysfunc(dosubl(%nrbrquote(%raw)));
    <table>
```

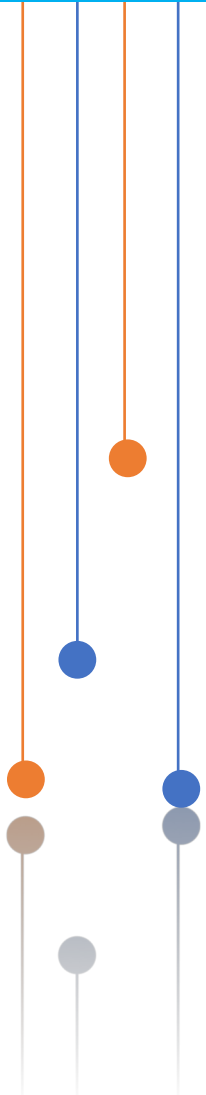
SAS Code to create HTML Output

```
<tr>
<td>
</fieldset>
<legend>
    &pageTitle
</legend>
%treeNodes(data = &data
    ,columns = &vars
    ,columnWidths = 100
    ,textWidth = 125
    ,divPrefix = R
```



SAS Code to create HTML Output

```
        ,headers = Y  
        ,expandedTo = 1  
        ,tableAttributes = cellspacing="2" cellpadding="0")  
    </fieldset>  
</td>  
</tr>  
</table>  
</body>  
</html>
```



AE Summary Table Output

PROC STREAM - with Collapsed Columns

Adverse Event By SOC and PT with Severity

	Severity/Intensity		A	B	T
⊕ Any Treatment-Emergent Adverse Event	Mild	1 (33.3)	1 (33.3)	2 (33.3)	
⊕ Gastrointestinal Disorders	Mild	1 (33.3)	0	1 (16.7)	
⊕ General Disorders And Administration Site Conditions	Mild	0 (0.0)	0	0 (0.0)	
⊕ Investigations	Mild	0	0 (0.0)	0 (0.0)	
⊕ Musculoskeletal And Connective Tissue Disorders	Mild	0	0 (0.0)	0 (0.0)	
⊕ Skin And Subcutaneous Tissue Disorders	Mild	0	1 (33.3)	1 (16.7)	
⊕ Vascular Disorders	Mild	0 (0.0)	0	0 (0.0)	

AE Summary Table

PROC STREAM - with Expanded Columns

Adverse Event By SOC and PT with Severity

	Severity/Intensity	A	B	T
⊕ Any Treatment-Emergent Adverse Event	Mild	1 (33.3)	1 (33.3)	2 (33.3)
⊕ Gastrointestinal Disorders	Mild	1 (33.3)	0	1 (16.7)
⊕ General Disorders And Administration Site Conditions	Mild	0 (0.0)	0	0 (0.0)
⊖ Investigations	Mild	0	0 (0.0)	0 (0.0)
	Moderate	0	1 (33.3)	1 (16.7)
	Severe	0	0 (0.0)	0 (0.0)
Blood Pressure Increased	Mild	0	0 (0.0)	0 (0.0)
	Moderate	0	1 (33.3)	1 (16.7)
	Severe	0	0 (0.0)	0 (0.0)
⊕ Musculoskeletal And Connective Tissue Disorders	Mild	0	0 (0.0)	0 (0.0)
⊕ Skin And Subcutaneous Tissue Disorders	Mild	0	1 (33.3)	1 (16.7)
⊕ Vascular Disorders	Mild	0 (0.0)	0	0 (0.0)

LAB Shift Table Output

PROC STREAM - with Collapsed Columns

Lab Shift table

	low	normal	high	missed
⊕ EPHPO3 10 mg (N = 8)				
⊕ EPHPO3 20 mg (N = 6)				
⊕ EPHPO3 20 mg evening (N = 6)				
⊕ EPHPO3 20 mg fed (N = 6)				
⊕ EPHPO3 40 mg (N = 6)				
⊕ EPHPO3 80 mg (N = 6)				
⊕ EPHPO3 Placebo (N = 16)				
⊕ EPHPO3 Placebo evening (N = 3)				

LAB Shift Table Output

PROC STREAM

Lab Shift table

	low	normal	high	missed
⊕ EPHPO3 10 mg (N = 8)				
⊖ EPHPO3 20 mg (N = 6)				
Day 1				
Low	0	0	0	0
Normal	0	6 (100.0)	0	0
High	0	0	0	0
EPHPO3 20 mg (N = 6)				
Day 2				
Low	0	0	0	0
Normal	0	6 (100.0)	0	0
High	0	0	0	0
EPHPO3 20 mg (N = 6)				
Day 4				
Low	0	0	0	0
Normal	0	6 (100.0)	0	0
High	0	0	0	0
EPHPO3 20 mg (N = 6)				
Follow-up				
Low	0	0	0	0
Normal	0	6 (100.0)	0	0
High	0	0	0	0
⊕ EPHPO3 20 mg evening (N = 6)				
⊕ EPHPO3 20 mg fed (N = 6)				
⊕ EPHPO3 40 mg (N = 6)				
⊕ EPHPO3 80 mg (N = 6)				
⊕ EPHPO3 Placebo (N = 16)				
⊕ EPHPO3 Placebo evening (N = 3)				

LAB Listing Output

PROC STREAM – with Collapsed Columns

Lab Listing of CHEMISTRY Category

	Planned Time Point Name	Date/Time of Specimen Collection	Result or Finding in Original Units	Reference Range Indicator	Abnormal clinical significance flag	Normal Range	Change from Baseline	Fasting Status
+	1001/C1 (EPHPO3 10 mg)- 45 Years /M /WHITE/194 cm/86.0 kg						.	
+	1002/C1 (EPHPO3 Placebo)- 42 Years /M /WHITE/169 cm/63.6 kg						.	
+	1003/C1 (EPHPO3 10 mg)- 28 Years /M /WHITE/178 cm/74.7 kg						.	
+	1004/C2 (EPHPO3 10 mg)- 43 Years /M /WHITE/179 cm/86.3 kg						.	
+	1005/C2 (EPHPO3 10 mg)- 47 Years /M /WHITE/185 cm/75.0 kg						.	
+	1006/C2 (EPHPO3 Placebo)- 47 Years /M /WHITE/174 cm/62.9 kg						.	

LAB Listing Output

PROC STREAM

Lab Listing of CHEMISTRY Category

	Planned Time Point Name	Date/Time of Specimen Collection	Result or Finding in Original Units	Reference Range Indicator	Abnormal clinical significance flag	Normal Range	Change from Baseline	Fasting Status
1001/C1 (EPHPO3 10 mg)- 45 Years								
/M /WHITE/194 cm/86.0 kg								
Albumin [g/L]								
	Screening	2011-05-12T07:16:00	48.1	NORMAL	Not allocable!	35.0 - 52.0	.	Y
	Day -1	2011-05-17T08:47:00	44.1	NORMAL	Not allocable!	35.0 - 52.0	.	Y
	Day 1	2011-05-18T10:35:00	50.2	NORMAL	Not allocable!	35.0 - 52.0	6.1	Y
	Day 2	2011-05-19T08:29:00	47.9	NORMAL	Not allocable!	35.0 - 52.0	3.7999999999999999	Y
	Day 4	2011-05-21T08:30:00	45.6	NORMAL	Not allocable!	35.0 - 52.0	1.5	Y
	Follow-up	2011-05-26T08:42:00	47.7	NORMAL	Not allocable!	35.0 - 52.0	3.6	Y

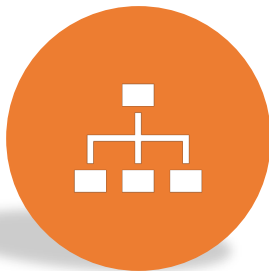
Conclusion



The main intention of the paper is to uncomplicate the validation/reviewing process by incorporating the PROC STREAM.



The validator/reviewer can use the PROC STREAM procedure in the place of PROC REPORT, with which we can compare the counts as well as check the cosmetic of the layout.



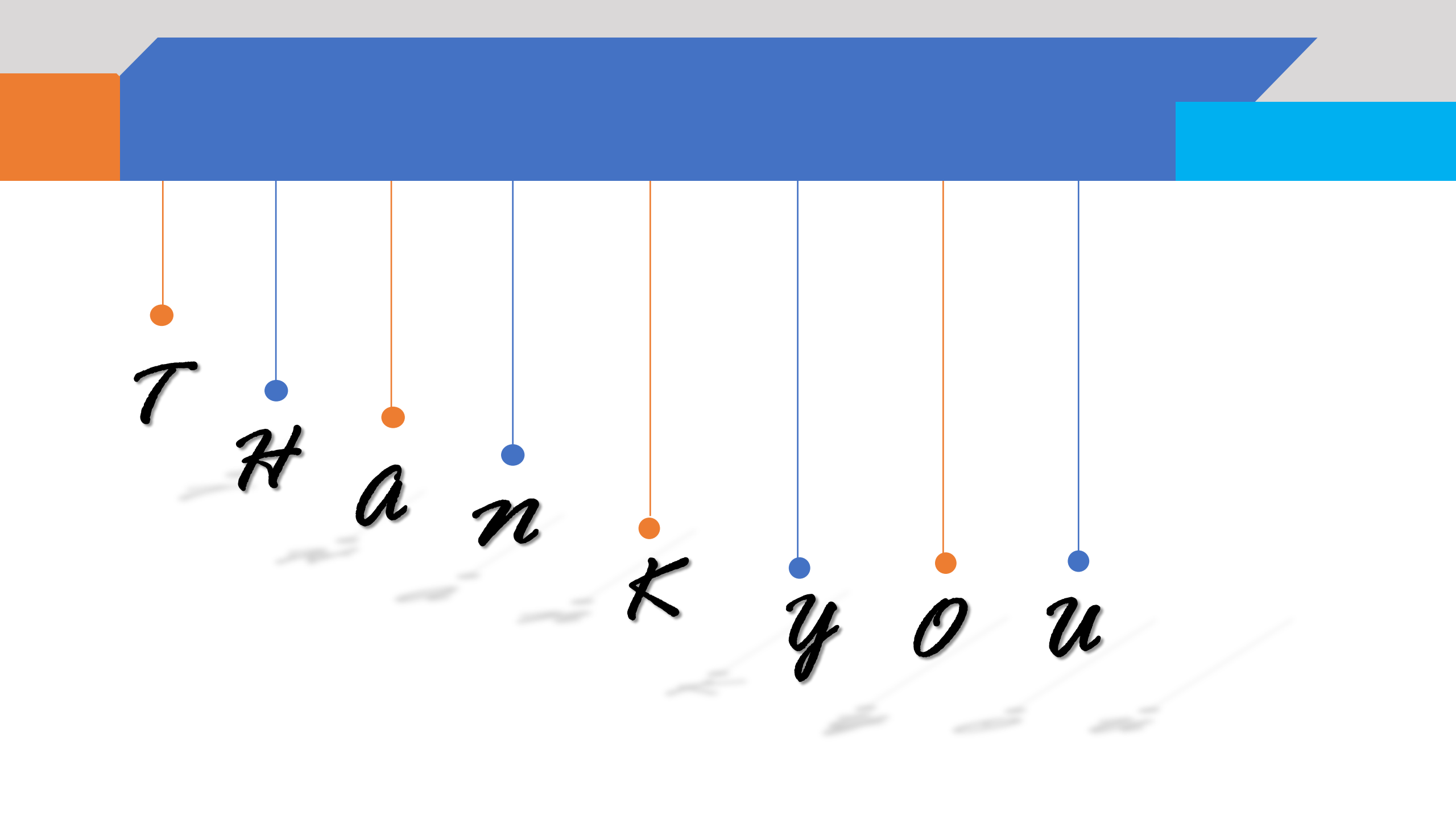
1000 page of reports are reviewed in one page by Proc stream.



The paper concentrates on creating a single step node.

Do you have any questions





The diagram features a large blue trapezoid at the top, with an orange rectangle on the left and a cyan rectangle on the right. Eight vertical lines hang from the bottom edge of the blue trapezoid. Each line has a colored dot (orange or blue) and a cursive letter below it. The letters are arranged in a descending staircase pattern from left to right. The letters are: T (orange dot), H (blue dot), a (orange dot), n (blue dot), K (orange dot), y (blue dot), o (orange dot), and u (blue dot). The letters 'H', 'a', 'n', 'y', 'o', and 'u' have faint, light-gray shadows cast to their right.

T

H

a

n

K

y

o

u