

PROGRAM SUBMITTAL

☐ New Program

☒ Revision to Program

0 0 9 8 1 C

Model No.

☐ 67

☐ 97

☒ 41C

Program Title

T A B U L A T I O R

No. of Steps/Lines

1 6 3

Category No.

0 0 1

Category Name

A C C O U N T I N G

Abstract — 50 Word Maximum This cross tabulation program is an improved version of

00179C. Input prompts are for row & column values which need be entered only

once. Output consists of grand total, row & column totals, % row & column

totals are of grand total, and the row % times an arbitrary reference number.

With the printer, an audit trail is provided for all input, and output is fully

labelled. A correction routine is provided to change row & column values.

Necessary Accessories: printer recommended

Name Gary Goodman

Company Wellington Systems, Inc.

Address 2730 High Ridge Road

City Stamford

State/Country Connecticut

Zip Code 06903

Phone Number (203) 322-5277

Acceptance Choice:

FOUR \$6.00 PROGRAMS,

ONE(1) POINT CERTIFICATE

Please use the checklist below to insure submittal of all proper program documents

☒ Signed Program Submittal Page

☐ Program Description II

☐ Program Listing(s)

☐ Registers, Status....

☐ Program Description I

☐ User Instructions

☐ Magnetic Card(s)

☐ Keyboard, Card Labeling (optional)

ACKNOWLEDGMENT AND AGREEMENT

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Signature

Gary Goodman

Date April 14, 1982

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A C C O U N T I N G

Abstract — 50 Word Maximum Simplifies standard crossfooting by requiring each entry to be keyed only once. Summary includes row totals, column totals, row and column proportions, and grand total. Printer recommended for verification of input data.

Necessary Accessories: printer optional

Name Gary Goodman

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Address 2730 High Ridge Road

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State/Country Connecticut Zip Code 06903

Phone Number (203) 322-5277

If my program is accepted, my bonus choice is: (Please select two programs if your program is a revision.)

Acceptance Choice: ☐ FOUR PROGRAMS, ☒ CREDIT FOR TWO PROGRAMS*, OR TWO PROGRAMS AND 10 BLANK CARDS.

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* No partial credit will be given. Select all four programs at the same time.

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Signature

Gary Goodman

Date Nov. 14, 1981

PROGRAM DESCRIPTION I

Page 1 of 8

Program Title Tabulator

Contributor's Name Gary Goodman

Address Wellington Systems, Inc., 2730 High Ridge Road

City Stamford State Connecticut Zip Code 06903

Program Description, Equations, Variables

This program is designed as an aid in doing cross tabulations. For each row-column entry, it automatically accumulates the row total, column total, and grand total. In addition to displaying these totals, it will also find the percent of the grand total that each row and column total represents, and for each row, the proportional value of some reference number. The HP-41C printer may be used to good advantage. All input data is formatted and printed for verification. Errors may be corrected with a routine provided for that purpose before proceeding to the printing of the results.

	Col. 1	Col. 2	Col. 3		Col. m	Row Totals
Row 1	Val _{1,1}	Val _{1,2}	Val _{1,3}		Val _{1,m}	RT ₁
Row 2	Val _{2,1}	Val _{2,2}	Val _{2,3}		Val _{2,m}	RT ₂
Row 3	Val _{3,1}	Val _{3,2}	Val _{3,3}		Val _{3,m}	RT ₃
		.			.	
		.			.	
		.			.	
Row n	Val _{n,1}	Val _{n,2}	Val _{n,3}		Val _{n,m}	RT _n
Column Totals	CT ₁	CT ₂	CT ₃		CT _m	Grand Total

Equations: Row or Column Ratio, % = $\frac{\text{Total}_i}{\text{Grand Total}} \times 100$

Proportional Value_i = $\frac{\text{RTotal}_i}{\text{Grand Total}} \times \text{Ref. Number}$

Necessary Accessories: Printer optional. Memory module required when the number of rows and columns exceeds 9.

This program has been verified only with respect to the numerical example given in *Program Description II*. User accepts and uses this program material AT HIS OWN RISK, in reliance solely upon his own inspection of the program material and without reliance upon any representation or description concerning the program material.

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PROGRAM DESCRIPTION II

Sample Problem (Sketch if Desired)

The manager of a small bookstore has kept records of the sales of booklets received from a certain publisher during the first five months of the year. He would like to know how many of each booklet were sold during that period, and also the total number of booklets from that publisher sold each month. He would also like to know the percentage of the total that each booklet represents and the average number of each booklet sold per month.

The sales data and the calculated results (in italics) are shown below.

Booklet Sales Data

	Jan	Feb	March	April	May	Totals	Percents	Average
Book 1	273	284	303	244	252	1356	11.51%	271.2
Book 2	1093	847	1222	1027	978	5167	43.87%	1033.4
Book 3	423	654	683	540	570	2870	24.37%	574.0
Book 4	118	255	453	755	805	2386	20.26%	477.2
TOTALS	1907	2040	2661	2566	2605	11779.00		2355.8

SOLUTION:

Input	Function	Display	Comments
	[XEQ] TAB	NO. COLUMNS ?	
5	[R/S]	NO. ROWS ?	
4	[R/S]	SIZE=13	minimum size needed for program
	[XEQ] SIZE 013, [R/S]	VALUE: 1,1 ?	Prompt for row 1, column 1
273	[R/S]	VALUE: 2,1 ?	" " row 2, column 1
1093	[R/S]	VALUE: 3,1 ?	" " row 3, column 1
423	[R/S]	VALUE: 4,1 ?	" " row 4, column 1
118	[R/S]	VALUE: 1,2 ?	" " row 1, column 2
284	[R/S]	VALUE: 2,2 ?	" " row 2, column 2
847	.	.	etc.
.	.	.	etc.
.	.	.	etc.
.	[R/S]	VALUE: 4,5 ?	Prompt for row 4, column 5
805	[R/S]	G. TOT.=11779.00	Grand Total
	[B]	ROW,1=1356.00	Sales Total for Book 1
	[R/S] *	ROW,2=5167.00	" " " Book 2
	[R/S] *	ROW,3=2870.00	" " " Book 3
	[R/S] *	ROW,4=2386.00	" " " Book 4
	[R/S] *	END	completion of row totals
	[A]	COL,1=1907.00	Sales Total for January
	[R/S] *	COL,2=2040.00	" " " February
	.	.	etc.
	.	END	completion of column totals
	[D]	ROW,1=11.51%	% of Total Sales Due to Book 1
	[R/S] *	ROW,2=43.87%	" " " " " " Book 2
	.	.	etc.
One way to calculate the average number of each book sold is to find the proportional value of each book to the average number of all books sold per month.			
	[G]	G. TOT.=11779.00	Grand Total display & G. T. in x Reg.
5	[÷]	2355.80	Average Number of Books Sold/Month
	[E]	ROW-% OF 2355.80	
		PROP,1=271.20	Average Monthly Sales for Book 1
	[R/S] *	PROP,2=1033.40	" " " " " " Book 2
	.	.	etc.

* If the printer is used, these [R/S] keystrokes are not needed.

This same example is now used with the printer to show printed output and to demonstrate how to correct errors in entered values.

INPUT	FUNCTION	DISPLAY	PRINTER	COMMENTS
	[XEQ] TAB	NO. COLUMNS ?		
5	[R/S]	NO. ROWS ?		
4	[R/S]	SIZE=13		
	[XEQ] SIZE 013			
	[R/S]	VALUE: 1,1 ?		
273	[R/S]	VALUE: 2,1 ?	VALUE: 1,1 273.00	
1093	[R/S]	VALUE: 3,1 ?	VALUE: 2,1 1093.00	
423	[R/S]	VALUE: 4,1 ?	VALUE: 3,1 423.00	
118	[R/S]	VALUE: 1,2 ?	VALUE: 4,1 118.00	
284	[R/S]	VALUE: 2,2 ?	VALUE: 1,2 284.00	
847	[R/S]	VALUE: 3,2 ?	VALUE: 2,2 847.00	
654	[R/S]	VALUE: 4,2 ?	VALUE: 3,2 654.00	
255	[R/S]	VALUE: 1,3 ?	VALUE: 4,2 255.00	
303	[R/S]	VALUE: 2,3 ?	VALUE: 1,3 303.00	
1222	[R/S]	VALUE: 3,3 ?	VALUE: 2,3 1222.00	
683	[R/S]	VALUE: 4,3 ?	VALUE: 3,3 683.00	
453	[R/S]	VALUE: 1,4 ?	VALUE: 4,3 453.00	
244	[R/S]	VALUE: 2,4 ?	VALUE: 1,4 244.00	
1072	[R/S]	VALUE: 3,4 ?	VALUE: 2,4 1072.00	Note wrong value!
540	[R/S]	VALUE: 4,4 ?	VALUE: 3,4 540.00	
755	[R/S]	VALUE: 1,5 ?	VALUE: 4,4 755.00	
252	[R/S]	VALUE: 2,5 ?	VALUE: 1,5 252.00	
978	[R/S]	VALUE: 3,5 ?	VALUE: 2,5 978.00	
570	[R/S]	VALUE: 4,5 ?	VALUE: 3,5 570.00	
805	[R/S]		VALUE: 4,5 805.00	
		G. TOT.=11824.00	G. TOT.=11824.00	
	[J]	R/C/OLD/NEW		
2	[ENTER]	4	[ENTER]	1072
			[ENTER]	1027
			[R/S]	
			T= 2.00	To correct, enter row, column, old value, & new value.
			Z= 4.00	
			Y= 1072.00	Verify correction
			X= 1027.00	
	[G]	G. TOT=11779.00	G. TOT.=11779.00	Correct Grand Total
	[B]	ROW,1=1356.00	ROW,1=1356.00	Sales Total for Book 1
		ROW,2=5167.00	ROW,2=5167.00	" " " Book 2
		ROW,3=2870.00	ROW,3=2870.00	" " " Book 3
		ROW,4=2386.00	ROW,4=2386.00	" " " Book 4
		END		completion of row totals
	[G]	G. TOT.=11779.00	G. TOT.=11779.00	Recall Grand Total
5	[÷]	2355.80		Average Books/Month
	[E]	ROW-% OF 2355.80	ROW-% OF 2355.80	
		PROP,1=271.20	PROP,1=271.20	Avg./Month for Book 1
		PROP,2=1033.40	PROP,2=1033.40	" " Book 2
		PROP,3=574.00	PROP,3=574.00	" " Book 3
		PROP,4=477.20	PROP,4=477.20	" " Book 4
		END		

USER INSTRUCTIONS

Page 4 of 8

				SIZE: (HP-41C) 4+ See Note
STEP	INSTRUCTIONS	INPUT	FUNCTION	DISPLAY
1	Load program. Set printer, if connected, to manual mode			
2	Initialize		[XEQ] TAB	NO. COLUMNS ?
3	Input: the number of columns	M	[R/S]	NO. ROWS ?
	and the number of rows	N	[R/S]	SIZE=nnn
4	Set SIZE, if necessary		[XEQ] SIZE nnn	
5	Press →		[R/S]	VALUE: 1,1 ?
6	Enter values in order by columns	value	[R/S]	VALUE: 2,1 ? etc.
7	Repeat step 6 until all values are input, at which point the grand total will automatically be displayed. Then you may perform any of the following options in any order. Find:			(or) G. TOT.=xxx.xx
8	Row Totals:		[B]	ROW,1=xxx.xx
	Perform this step for i=2,3,...N, until END is displayed.		[R/S]*	ROW,i=xxx.xx
9	Column Totals:		[A]	COL,1=xxx.xx
	Perform this step for i=2,3,...M, until END is displayed.		[R/S]*	COL,i=xxx.xx
10	Row Percentages of Grand Total:		[D]	ROW,1=xx.xx%
	Perform this step for i=2,3,...N, until END is displayed.		[R/S]*	ROW,i=xx.xx%
11	Column Percentages of Grand Total:		[C]	COL,1=xx.xx%
	Perform this step for i=2,3,...M, until END is displayed.		[R/S]*	COL,i=xx.xx%
12	Proportion of Row Total to a Number:			
	Input reference number	ref. #	[E]	PROP,1=xxx.xx
	Perform this step for i=2,3,...N, until END is displayed		[R/S]*	PROP,i=xxx.xx
13	Review Grand Total:		[G]	G. TOT.=xxx.xx
14	<u>Correcting Input Errors:</u> When the printer is connected, input errors can be seen and then corrected.			
	To change an input value:		[J]	R/C/OLD/NEW
	Input: Row #, [ENTER], Column #, [ENTER], Old Value, [ENTER], New Value, [R/S]			
	then proceed with any of steps 8-14.			

Note: The program, as written, will display all results to 2 decimal places. The user can easily change this by changing steps 48 and 121 in the program.

*R/S will not need to be pressed if the printer is attached.

Note: The minimum size is 4 + number of columns + number of rows.

PROGRAM LISTING

Page 5 of 8

41C

01 LBL "TAB

"

02 FIX 0

03 SF 27

04 CF 29

05 3

06 "NO. COL
UMNS ?"

07 XEQ 09

08 STO 01

09 X<>Y

10 "NO. ROW
S ?"

11 XEQ 09

12 STO 00

13 STO 02

14 ISG Y

15 CLA

16 "SIZE="

17 ARCL Y

18 PROMPT

19 FRC

20 3

21 +

22 0

23 LBL 01
24 STO IND
Y

25 ISG Y

26 GT0 01

27 CF 22

28 1

29 ENTER↑

30 ENTER↑

31 LBL 02

32 "VALUE:
"

33 FIX 0

34 ARCL Y

35 "F,"

36 ARCL Z

37 "F "

38 FS? 55

39 ACA

40 "F?"

41 TONE 5

42 PROMPT

Compute SIZE and
register locations
for column sums
and row sums.

Clear registers
for column sums,
row sums, and
grand total.

Prompt for value.

43 FC?C 22

44 0

45 ST+ IND

01

46 ST+ IND

02

47 ST+ 03

48 FIX 2

49 FS? 55

50 ACX

51 ADV

52 RDN

53 ST+ Y

54 ISG 02

55 GT0 02

56 STO Y

57 ST+ Z

58 RCL 00

59 STO 02

60 RDN

61 ADV

62 ISG 01

63 GT0 02

64 LBL G

65 "G. TOT.
="

66 ARCL 03

67 AVIEW

68 ADV

69 BEEP

70 RCL 03

71 STOP

72 LBL B

73 "ROW,"

74 CF 15

75 RCL 03

76 RCL 00

77 GT0 04

78 LBL D

79 "ROW,"

80 SF 15

81 100

82 RCL 00

83 GT0 04

} If no entry,
insert zero.
Accumulate column
total.

Accumulate row
total.
Accum. grand total.

} Print entry.

Increment row no.
Inc. & test row ptr.

Reset row to 1 &
inc. column no.

} Reset row ptr.

Inc. & test col. ptr.

- Grand Total -

- Row Totals -

- Row Percents -

PROGRAM LISTING

Page 6 of 8

41C

```

84♦LBL E
85 "ROW-% 0
F "
86 ARCL X
87 AVIEW
88 "PROP,"
89 CF 15
90 RCL 00
91 GTO 04
92♦LBL A
93 CF 15
94 RCL 03
95 GTO 03
96♦LBL C
97 SF 15
98 100
99♦LBL 03
100 "COL,"
101 RCL 01
102 FRC
103 4
104 +
105♦LBL 04
106 ASTO 02
107 1.1
108 X<> Z
109 RCL 03
110 /
111♦LBL 05
112 CLA
113 ARCL 02
114 FIX 0
115 ARCL Z
116 "F%"
117 RCL IND
Y
118 X<>Y
119 ST* Y
120 X<>Y
121 FIX 2
122 ARCL X
123 FS? 15
124 "F%"
125 AVIEW
126 FC? 55
127 STOP
128 RDN
129 ISG Z
130 ISG Y
131 GTO 05
132 ADV
133 " END"

```

- Row Proportions -

- Column Totals -

- Column Percents -

} Reinitialize
column pointer.

Initialize row or
column indicator.

Display routine

Recall row or
column total.
Compute total,
percent, or
proportional value.

Incrmnt indicator
Incrmnt pointer

At end, display END.

```

134♦LBL 09
135 PROMPT
136 RCL Y
137 +
138 STO Z
139 1 E3
140 /
141 +
142 ISG X
143 RTN
144♦LBL J
145 "RTCTOLD
↑NEW"
146 PROMPT
147 FS? 55
148 PRSTK
149 ADV
150 X<>Y
151 -
152 3
153 ST+ Z
154 CLX
155 RCL 00
156 DSE X
157 CLA
158 ST+ T
159 RDN
160 ST+ IND
Y
161 ST+ IND
Z
162 ST+ 03
163 END

```

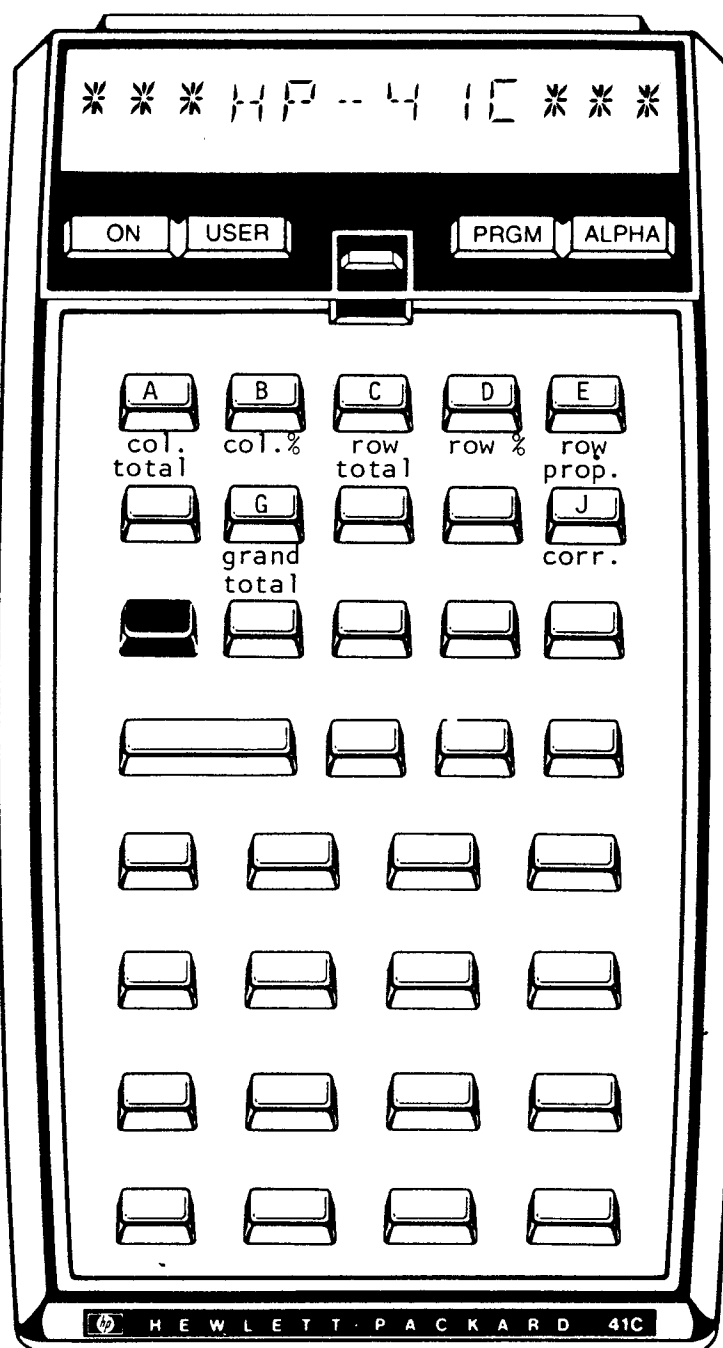
Subroutine to
calculate initial
column and row
pointers.

Error correction
routine

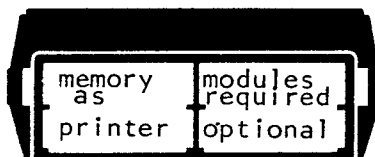
[illegible]

KEYBOARD CARD LABELING

KEYBOARD



SYSTEM
CONFIGURATION



CARD

