

Test Analysis System "Itman"

by J.G. Blom and L.W.A. van Herpt.

1.0 Introduction.

Scoring and analysing of tests, whether psychological tests, achievement tests etc., is a time consuming business. Although manual scoring is possible, the analyses - especially when many testees are involved - runs up against insuperable difficulties. This problem led to the designing and writing of the test analysis system ITMAN, so that computer processing became possible.

2.0 Output.

The program deck yields the following output.

- 2.1 Response matrix with questions ordered in decreasing P-values (horizontally) and increasing testee scores (vertically). The matrix cells contain the coded responses. To the right of the matrix the score for each testee is printed, both before and after elimination of items (see 4.0). Underneath the matrix the right number of responses per item and the P-value is indicated in promilles. (See Sample I).
- 2.2 Item-distractor analysis per quartile and for the total in frequencies and in percentages. (See Sample II).
- 2.3 Scoring-matrix. Its organisation is identical to that of the response matrix. Questions which are answered correctly are marked with an asterisk. (See Sample III).
- 2.4 Item-statistics per item, with question-number, key, number of right responses, P- and A-values, standard deviations of the P-value, item-test-correlation and discrimination-index. Besides this the test reliability (Kuder - Richardson) is printed (See Sample IV).
- 2.5 Scoring histogram (See Sample IV).

2.6 List of names of the testees with their respective scores.  
The testees are ordered according to increasing score.

3.0 Input.

The input of the key and of the scores of the testees is effected by means of punched cards. The cards can be obtained through machine conversion of automatic scoring records or by handcoding and punching the scores.

4.0 Elimination.

When processing the data a number of questions (with a maximum of 20) can be eliminated. All eliminated questions are identified with an asterisk after the question-number in the output. The eliminated questions are not computed in the item-test-correlation (0.00 in item-statistics).

5.0 Program-capacity.

The program allows for tests with a maximum of 200 questions for 300 testees.

SAMPLE I

ITMAN DESIGNED AND PROGRAMMED BY J.G. BLOM AND L.W.A. VAN HERPT.

RESPONSEMATRIX

ITEM ELIM. KEY	4	3	6	16	2	9	11	15	10	1	13	5	7	8	14	12	17			
*****	*		*				*			*										
S	2	1	2	2	3	1	3	2	3	1	2	2	3	1	1	1	3			
11	2	1	1	2	1	2	3	3	1	1	2	3	2	3	3	1	3	8	5	384
23	2	1	2	3	2	1	3	3	2	1	2	2	2	1	2	3	1	9	5	384
26	2	1	2	2	1	1	3	2	2	1	1	3	3	2	3	2	1	9	5	384
31	2	1	2	3	3	1	3	3	1	1	3	2	1	3	1	3	1	9	5	384
37	2	2	2	2	3	2	3	3	3	1	3	2	1	2	3	1	3	10	6	461
40	1	3	2	2	3	3	3	2	2	1	1	3	2	1	3	1	3	9	6	461
3	2	1	2	2	3	1	3	2	1	3	2	3	3	2	3	2	1	10	7	538
14	2	1	2	2	3	1	3	2	3	3	1	2	2	2	3	2	1	10	7	538
22	1	2	2	2	3	3	3	2	1	1	3	2	1	1	1	3	3	10	7	538
38	2	1	2	2	3	1	3	2	3	1	1	3	3	2	3	2	2	11	7	538
7	2	1	2	2	2	1	3	2	3	1	1	3	3	1	2	1	1	12	8	615
35	2	1	1	2	3	2	1	2	2	2	2	3	3	1	2	2	3	9	8	615
28	2	1	2	3	3	1	3	3	3	2	2	2	2	1	1	1	1	12	9	692
30	2	1	2	2	3	1	1	3	3	1	2	3	3	2	1	1	2	12	9	692
20	2	1	2	2	3	1	3	1	3	2	2	3	2	1	1	1	3	13	10	769
39	2	1	3	2	3	1	3	2	3	1	2	2	3	3	1	2	1	13	10	769
4	2	1	2	2	3	2	1	2	3	3	2	2	3	1	1	2	3	13	11	846
15	2	1	2	2	3	1	1	2	3	1	1	3	3	1	1	1	3	14	11	846
18	2	1	2	2	3	1	2	2	3	1	2	2	3	3	1	1	2	14	11	846
33	2	1	2	2	3	1	3	2	3	1	2	2	3	1	1	2	2	15	11	846
41	2	1	2	2	3	1	3	2	3	1	2	2	2	1	1	1	1	15	11	846
17	2	1	2	2	3	1	3	2	3	1	2	2	3	1	1	3	3	16	12	923
25	2	1	2	2	3	1	3	2	3	1	2	2	3	1	1	2	3	16	12	923
2	2	1	2	2	3	1	1	2	3	2	2	2	3	1	1	1	3	15	13	1000
6	2	1	2	2	3	1	3	2	3	1	2	2	3	1	1	1	3	17	13	1000
8	2	1	2	2	3	1	3	2	3	1	2	2	3	1	1	1	3	17	13	1000
13	2	1	2	2	3	1	3	2	3	1	2	2	3	1	1	1	3	17	13	1000
21	2	1	2	2	3	1	3	2	3	3	2	2	3	1	1	1	3	16	13	1000
32	2	1	2	2	3	1	3	2	3	1	2	2	3	1	1	1	3	17	13	1000
36	2	1	2	2	3	1	3	2	3	2	2	2	3	1	1	1	3	16	13	1000
SUM	28	27	27	27	26	24	24	23	22	21	21	20	20	20	20	17	17			
P	933	900	900	900	866	800	800	766	733	700	700	666	666	666	666	566	566			

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SAMPLE III

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SCORING-MATRIX

ITEM	4	3	6	16	2	9	11	15	10	1	13	5	7	8	14	12	17			
ELIM.	*		*				*			*										
KEY	2	1	2	2	3	1	3	2	3	1	2	2	3	1	1	1	3			
.....																				
S																				
11	*	*		*			*			*	*					*	*	8	5	384
23	*	*	*			*	*			*	*	*		*				9	5	384
26	*	*	*	*		*	*	*		*			*					9	5	384
31	*	*	*		*	*	*			*		*			*			9	5	384
37	*		*	*	*		*		*	*		*				*	*	10	6	461
40			*	*	*		*	*		*				*		*	*	9	6	461
3	*	*	*	*	*	*	*	*			*		*					10	7	538
14	*	*	*	*	*	*	*	*	*			*						10	7	538
22			*	*	*		*	*		*		*		*	*		*	10	7	538
38	*	*	*	*	*	*	*	*	*	*			*					11	7	538
7	*	*	*	*	*	*	*	*	*	*			*	*		*		12	8	615
35	*	*		*	*			*			*		*	*			*	9	8	615
28	*	*	*		*	*	*		*		*	*		*	*	*	*	9	9	692
30	*	*	*	*	*	*			*	*	*		*		*	*	*	12	9	692
20	*	*	*	*	*	*	*		*	*	*			*	*	*	*	13	10	769
39	*	*		*	*	*	*	*	*	*	*	*	*	*	*			13	10	769
4	*	*	*	*	*	*		*	*	*	*	*	*	*	*		*	13	11	846
15	*	*	*	*	*	*		*	*	*	*	*	*	*	*	*	*	14	11	846
18	*	*	*	*	*	*		*	*	*	*	*	*	*	*	*	*	14	11	846
33	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	15	11	846
41	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	15	11	846
17	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	16	12	923
25	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	16	12	923
2	*	*	*	*	*	*		*	*		*	*	*	*	*	*	*	15	13	1000
6	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	17	13	1000
8	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	17	13	1000
13	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	17	13	1000
21	*	*	*	*	*	*	*	*	*		*	*	*	*	*	*	*	16	13	1000
32	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	17	13	1000
36	*	*	*	*	*	*	*	*	*		*	*	*	*	*	*	*	16	13	1000
SUM	28	27	27	27	26	24	24	23	22	21	21	20	20	20	20	17	17			
P	933	900	900	900	866	800	800	766	733	700	700	666	666	666	666	566	566			

SAMPLE II \*)

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ITEM-DISTRATOR ANALYSE

IT	K	N	QU1					QU2					QU3					QU4					TOT				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
1*	1	21 70	6	0	1	0	0	4	3	1	0	0	6	0	1	0	0	5	2	1	0	0	21	5	4	0	0
			85	0	14	0	0	50	37	12	0	0	85	0	14	0	0	62	25	12	0	0	70	16	13	0	0
2	3	26 86	2	1	4	0	0	0	1	7	0	0	0	0	7	0	0	0	0	8	0	0	2	2	26	0	0
			28	14	57	0	0	0	12	87	0	0	0	0	100	0	0	0	0	100	0	0	6	6	86	0	0
3	1	27 90	5	1	1	0	0	7	1	0	0	0	7	0	0	0	0	8	0	0	0	0	27	2	1	0	0
			71	14	14	0	0	87	12	0	0	0	100	0	0	0	0	100	0	0	0	0	90	6	3	0	0
4*	2	28 93	1	6	0	0	0	1	7	0	0	0	0	7	0	0	0	0	8	0	0	0	2	28	0	0	0
			14	85	0	0	0	12	87	0	0	0	0	100	0	0	0	0	100	0	0	0	6	93	0	0	0
5	2	20 66	0	3	4	0	0	0	3	5	0	0	0	6	1	0	0	0	8	0	0	0	0	20	10	0	0
			0	42	57	0	0	0	37	62	0	0	0	85	14	0	0	0	100	0	0	0	0	66	33	0	0
6*	2	27 90	1	6	0	0	0	1	7	0	0	0	0	6	1	0	0	0	8	0	0	0	2	27	1	0	0
			14	85	0	0	0	12	87	0	0	0	0	85	14	0	0	0	100	0	0	0	6	90	3	0	0
7	3	20 66	2	3	2	0	0	1	3	4	0	0	0	1	6	0	0	0	0	8	0	0	3	7	20	0	0
			28	42	28	0	0	12	37	50	0	0	0	14	85	0	0	0	0	100	0	0	10	23	66	0	0
8	1	20 66	2	3	2	0	0	5	3	0	0	0	5	0	2	0	0	8	0	0	0	0	20	6	4	0	0
			28	42	28	0	0	62	37	0	0	0	71	0	28	0	0	100	0	0	0	0	66	10	13	0	0
9	1	24 80	4	2	1	0	0	6	1	1	0	0	6	1	0	0	0	8	0	0	0	0	24	4	2	0	0
			57	28	14	0	0	75	12	12	0	0	85	14	0	0	0	100	0	0	0	0	80	13	6	0	0
10	3	22 73	3	3	1	0	0	1	1	6	0	0	0	0	7	0	0	0	0	8	0	0	4	4	22	0	0
			42	42	14	0	0	12	12	75	0	0	0	0	100	0	0	0	0	100	0	0	13	13	73	0	0
11*	3	24 80	0	0	7	0	0	2	0	6	0	0	2	1	4	0	0	1	0	7	0	0	5	1	24	0	0
			0	0	100	0	0	25	0	75	0	0	28	14	57	0	0	12	0	87	0	0	16	3	80	0	0

\*) Only part of the table is printed.

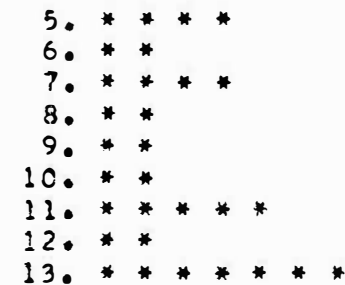
SAMPLE IV

ITMAN DESIGNED AND PROGRAMMED BY J.G. BLOM AND L.W.A. VAN HERPT.

ITEM-STATISTICS

ITEM	K	N	P	SD	RIT	D	P/A	VALUES		
								1	2	3
1*	1	21	0.70	0.08	0.00	-0.11	70	16	13	
2	3	26	0.86	0.06	0.50	0.33	6	6	86	
3	1	27	0.90	0.05	0.36	0.33	90	6	3	
4*	2	28	0.93	0.04	0.00	0.22	6	93	0	
5	2	20	0.66	0.08	0.46	0.44	0	66	33	
6*	2	27	0.90	0.05	0.00	0.11	6	90	3	
7	3	20	0.66	0.08	0.58	0.77	10	23	66	
8	1	20	0.66	0.08	0.56	0.56	66	20	13	
9	1	24	0.80	0.07	0.40	0.44	80	13	6	
10	3	22	0.73	0.08	0.73	0.77	13	13	73	
11*	3	24	0.80	0.07	0.00	-0.11	16	3	80	
12	1	17	0.56	0.09	0.37	0.44	56	30	13	
13	2	21	0.70	0.08	0.58	0.66	20	70	10	
14	1	20	0.66	0.08	0.75	0.77	66	10	23	
15	2	23	0.76	0.07	0.47	0.44	3	76	20	
16	2	27	0.90	0.05	0.36	0.22	0	90	10	
17	3	17	0.56	0.09	0.42	0.55	30	13	56	

SCORING-HISTOGRAM



RELIABILITY R=0.74

N.B. For typographic reasons only part of a test is shown in this sample (17 items).

The elimination of four questions is shown.