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Some Results on Bivalent Table

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Abstract:

A discrepancy on the issue was uncovered in this paper. For any two-valued table with a limited number of rows and columns. T is p-extensive for an arbitrarily large number of numbers P, and is it also q-extensive for all integers q bigger than P? [1][7]

Key words:
bivalent table , extensive, embeddability, bad ordered pair, p-extensive.

1- Introduction:

A bivalent table is a system consisting of two distinct sets, E and F, and a function that assigns a positive or negative value to each member in the cartesian product ExF.

1- If we are suppose two tables, T on ExF and T' on E'X F', then we say that T T' if there certainly is an injection e through E into E' and an injection f from F into F' such that T'(ex,fy) = T(x,y) for every x in E and y in F. [4] [2]

2- If there exists a table X+ formed from X by inserting a row, then T is said to be extended by X relative to rows if and only if T X+. In contrast, T is inextensive by X (relative to rows) if T X but T X+ for every X+ derived

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from X by adding a row. A table T with two columns (below, left) is inextensive by a table X with four columns (below, right) with respect to the number of rows[3][5]:

+	+		+	-	+	+
-	-		+	-	+	-
+	-		+	-	-	-
+	-		-	+	-	+

As a preliminary observation, it is obvious that there is a contradiction when trying to embed T in the second and fourth columns of X, as adding + + to the third and fourth columns necessitates adding - to the second column (due to the second and third columns). Since T is embedded in the first and third columns, adding - - to them would result in a contradiction unless you also added + to the first column (since the first and fourth columns already had - - added to them).

3-If a table T is extensive for every table with p rows, then we conclude that T is p-extensive (p is a natural integer). That is, for each table X with p rows and such that T X, there exists a table X+ (resulted from X by inserting a row) that likewise honors the non-embeddability TX+.When it comes to rows, [6] T is considered to be extensive if and only if it is extensive by all tables, and inextensive otherwise.

There must be at least two identical rows, a row with a (+), a row with a (-), and a row with a (-). In the case of the example T with two columns and four rows shown above, this holds true.

The Issue. Do an infinite number of integers p exist such that T is p-extensive, and does an integer p exist such that T is q-extensive, for any integer q bigger than p? This question is asked for every finite (i.e., with a finite set of rows and columns) bivalent table.[2]We assume a

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D.R.Fulkerson-style cartesian product Ex F, with Card F5, and inextensive by X tables, where T is a table.

If we remove any column from the set E of columns, then there exists an X+ formed from X by adding a row in which T is no longer embeddable, then we may insist that E is minimum. Therefore, each column is unique (since the two columns of T are also unique), and each column has both a (+) and a (-) in it. If there were only (+) columns, for example, adding another (+) to that column wouldn't make it possible to embed T.

If T can be embedded in the table with two columns a, b completed by the values v(a), v(b), where a and b are ordered pairs, then the ordered pair (v(a),v(b)) is bad for (a,b). There are only five options when given the two columns a and b. If (-,-) and twice (+,-) or twice (-,+) are rows in (a,b), then the only undesirable pair for (a,b) is either (+,+) or (-,-) and twice (+,-). You may either assume that (+,-) is the only terrible pair, or that (+,-) is the only bad (ordered) pair, or that (-,+) is the only bad pair, or that (+,-) and (-,+) are both bad pairings. It follows immediately that a two-column version of table X cannot give way to the inextensivity of table T.

Proposition:

Given three columns (a, b, c), it is impossible for (+,+) to be detrimental to (a,b) and (-,-) to be detrimental to (b,c)[8] .

Assume, in fact, that the three columns are separate and that each column has a minimum of one (+) and one (-). A first row with (-,-) for (a,b) must exist (because (+,+) is undesirable). Since (-,-) is already present in (b,c), there is no way for (-,-) to be a bad pair for (b,c); so, our initial row is (-,-,+). Similarly, we have a second row that reads (-), (+), and (+) for b, c, and a, respectively. Given that a must be present in columna, we get a third row with (+) for a, (-) for b, and (+) for C: hence, (+), (-), (+). Similarly, c must have a (-) in it, making (-), (+), (-) our fourth row. Finally, T is nested in the rows (a,c), which is a contradiction.

It follows from the above statement that X cannot decrease to three columns (assumed to be distinct and to include (+) and (-)) if we demand that T be inextensive by X. As an example, if T is inextensive by x, then there must be at least one bad pair (+,+) and one bad pair (-;-) in order for the assertion to be false.

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