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(-1)-Reconstruction of the Decomposables Solution of M_n

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Abstract

The topic of reconstructing a relationship was raised in two different ways by S. Ulam (1960) and R. Fraise (1970). If the constraints R/E-X and R-/E-X are isomorphic for each element XE, then R and R are also isomorphic.The first falls under the weak hypotheses of E being a set and R, R being two relations with base E and the same arithema.
If the constraints R/X and R/X are isomorphic for each stringent portion X of E, then R and R are also isomorphic, according to the second assertion.
In this study, we demonstrate that the requirement is satisfied by the decomposable tournament Mn undergoing (-1) reconstruction.

$R \ngtr A_1, A_2, A_{3,4}, A_5$
and $R > B_1, B_2, B_3, B_4$

Key words: decomposable Tournament, Reconstruction, Relation, 3-cycle, 4-cycle, Bounds, interval, isomorphic.

1.Introduction

We may represent the binary relation R as a dilation of a finite chain C. The points are therefore replaced with one of the following relations: We see that c has at least two points and differs from R whether it is a chain, 3-cycle, 4-cycle, or Mk. If |c|=2, we get two classes, C1 and C2, and the answers are as follows:

- One of such classes is a 4-cycle, whereas the other is either a 3-cycle or a 4-cycle.
- One is Mk, and the other is random [4] and [5].

If |c| is 3, then the answers are as follows:
One class is a 4-cycle, one is a 3-cycle or 4-cycle, and the others are 3-cycle, 4-cycle, or chains.
Alternatively, one type is a Mk, while the others are 3-cycle, 4-cycle, chain, or Mk.

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We see that there is a decomposable solution that does not include Mn but rather all of the aforementioned solutions, at least one of which contains a 4-cycle.

2. Tournaments characterization of m_n

The tournaments m n are defined in such a way that m_n (i, j) = +if and only if i = j-1 or i = j+1.It should be noted that m_4 is a 4-cycle and m 3 is a 3-cycle.

These tournaments achieved the following success:

- $m_n$and its inverse are isomorphic.
- m_n cannot be decomposed.
- The number of 3-cycles that pass through the vertices 1, 2, 3,..., n is given by m_n.

Receptivity = (1, 2, 3, 4,... 3, 2, 1).

3. The A_i bounds description [3] and [4]

Allow the base by removing a 3-cycle from A = {0, 1, 2, 3, 4}, we get:
A1: by substituting a three-cycle for one of the points.
A2: by replacing two points with a chain of two items each.
A3: by substituting a three-chain for one of the points.
A4: defined by = A4/{i, i+1, i + 2} (i mod 5), isomorphic to 3-chain.
A5: A positive diamond defined by = A5/{0, 1, 2, 3} when vertex equal to 0.
A5/{0, 1, 2, 3} can be a negative diamond when vertex 1, and A5 (2, 4) = +, the diamonds are formed by removing a 3-cycle one and only one of the chain's two points to form two components, 1, 2. (negative when it is equal to 2 and positive when the vertex is equal to 1)

Notice:
The Ai is also not deleted from the chain, as shown by B1 by the 4-chain, B1 and B2 by the 4-cycle, B3 by the positive diamond, and B4 by the negative diamond.

4. Theorem: R is solution of the problem $R \ngtr A_1, A_2, A_3, A_4, A_5$ and $R > B_1, B_2, B_3, B_4$.

Proof:

1- R > B1, B2, B3, B4, obviously if one of the classes is M_k. If none of the classes are M_k. In all circumstances, there are two classes, one of which embeds a 4-cycle and the other a 3-cycle, and we can prove that $\forall\ A : B_i < R$.
2. We have R $\ngtr$A1,…, An assumed that Ai< R.
-Either A_i has only one point in each C_i, or A_i is a chain (which is impossible).
-or, A_i has at least two points, and at least one of C_i is not totally contained; in this case, A_i is a chain dilate (impossible). (Based on A_i's description)

Corollary:

R is the system solution, and R$\not>$ B1, B2, B3, B4 and $R > B_1, B_2, B_3, B_4$ (-1). We know that the relation R is a dilatation of a chain C, and that each point of C may be replaced by a relation of base Ci, which is either a chain.
-A 3-cycle or a 4-cycle.
-A 4-cycle engine.
-One of the M_k.
According to Harary and Palmer's theorem, if the chain C has at least two points, R is not strong. [1]. It is known that any tournament with a cardinal greater than 4 is (1) constructible [2]. Then, if R is decomposable and has a cardinal greater than 4, R is (-1)-reconstructive. We will express the isomorphism, f between and R i, which means we must establish A = i=C i-. We write $\forall A = C_i = C_i^-$ the R decomposition is not unique, so we start with the provided decomposition and use the following approach to get the interval I of C. When a chain 1 cardinal of known 1 delates each point of i, these chains are classified as a single type. These maximum intervals are grouped so that each class Ci is either a 3-cycle, 4-cycle, or Mn; or a chain, in which case C_{i-1} and C_{i+1} (if they exist) are not chains.
In order to investigate the isomorphism from R to R^-, we consider R and R^- to be dilations of a chain C, with the points of C replaced by the classes C_i for R and C_i^- for R^-.

4.1 The first proposition

Every restriction of R of the kinds 3-cycle, 4-cycle, and M_n is entirely contained in one class of R, and the same is true for R^-.
Proof:
First, to prove that any 3-cycle belongs to one of the R classes it must done as follows:
If we have a, b ϵ C_i, and c ϵ C_j, with j ≠ A, then we get R(c, a) ≠ R(c, b), and it follows that R/C_i is not an interval.
If i, j or k are distinct S_i two a two such as $a \epsilon C_i$, $b \in C_j$, $c \in C_k$, then C_i, C_j, and C_k are the three points of C's delate.
If there is a 3-cycle in C and C is not a chain, then each 3-cycle in R is entirely contained in the class C_i, and vice versa for R. Since the final two relations may be reconverted by the sequence $\Gamma_1, \Gamma_2 \ldots \Gamma_p$ each 3-cycle is totally contained in one class. p in such a way that $\Gamma_i \cap \Gamma_{i+1} \neq \varphi, \forall A$.

Corollary:
If R/C_i-x is a 3-cycle, 4-cycle, or M_n for all x and A, then fx $(Ci - x)$ is completely contained in R's class C_j^- of R^-.

Proof:
According to the above proposition 1, the image of a 3-cycle is a 3-cycle. which chains include a 3-cycle in the class C_j^-, a 4-cycle, and M_n. When $R(x, y) = +$, we say that x domains y.

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When each element of *A* dominates in R each element of B, the part A dominates the part B. When the portion A is dominant in R, it is complementary; when it is demonized in R, it is complementary.

Remark: If part *A* is dominant in *R*, there is no part B dominant in *R* with the same cardinal as part *A*. Specifically, when each element of *E-A* dominates or is dominated by *A*, the subset *A* of *E* is an interval of *R*.

4.2 The second proposition

For any j > I Ci and C j- are disjoint if the class R/Ci is a chain.

Proof:

If an element *x* exists in a C_i and a class C_j^- for j > i then there exists $u \in C_k$ with $k > i$ such that *fx(u)* belongs to the class C_h^- with h_i.

Assume that initial $k = I + 1$. The R/C_i class transforms into a chain, and the R/C_i+1 class is reconverted by a 3-cycle, let A, which passes through u by the image of this 3-cycle *A*.

We have a contradiction when *fx* is included in C_h^-.

In reality, because u $\in C_k$ and $k > A$ for every *y Cm*, with m I we obtain R (y, u) = +, which means that fx (y) belong to one class C_n^- with n_i. Let *B* (or B^-) be the case. The image of $A \cup B$- *x* by f_x must be included in the B^- (resp. B^-) contradiction for the union of these classes of R (resp. R^-) of index *i*. Then $k > I + 1$. Because all the C_i+1 dominating points result in a conflict on the cardinal of B- in this situation, the picture of C_i+1 must include B^-.

4.3 The Third proposition

$C_i^- = C_i$ if class R/C_i is a chain.

Proof:

The fact that each member *x* of C_i belongs to the class C_j^- with $j \leq i$ is shown above. There is no chain in the class R^-/C_j^-. In actuality, if we leave *x*, we won't disrupt any *R* by (-1)-hypo morphine cycles. Any cycle of R^- is unbreakable. The class C_j^- does not then include any cycles that pass via *x*. R^-/C^-_j is not a chain then. For the class C_j^- = I $\leq j$, we have i=j, C_j^- = I $\leq j$ (proposition above).

4.4 The fourth proposition

If the relationship *S* is a 3-cycle, 4-cycle, or M_n type. Consequently, *S* lacks an interval, where cardinal is equal to card *(s)-1*. The opposite, which is also a singleton, is an interval.

For example, the point that completely dominates the other or is dominated from the other, which implies that there is no such link.

4.5 The fifth proposition of C_1=C_1^-

Proof:

The conclusion of the corollary above shows that the first case R/C1 is a chain. Whereas, the secondly case R/C1 is not a chain.

In the *R/C1* is a 3-cycle, 4-cycle, or M_n in this situation. Let $x \in C1$ Consider the limitation of R to C_1-x and R^- to C_1^- -x if x $\notin C_1^-$. Via deleting x, we turn back at least three cycles in C1 that go by x, but we still have C_1^- -x =C_1^-. C_1-x. When C_1-x's image by *fx* becomes an interval dominant R-/E-x, it becomes an interval dominant R-/E-x as well. Due to the fact that C 1- is an interval dominant $R^- /E - x$, *fx* (C1 x) will contain in C_1^- then rigorously contain in $C_1^-$and finally fx ($C_1 - x$) will arrive an interval dominant $R^- /C_1^-$of cardinal equal card ($C_1^- - 1$) contradiction with statement (4).

4.6 The sixth proposition ∀ i : C_i = C_i

Proof:

Using induction, we demonstrate that for i = 1, assuming that is true for all j < i we place $C = C_1 \cup C_2 \cup \ldots\ldots \cup C_{i-1}$ and $C^- = C_1^- \cup C_2^- \cup \ldots\ldots\ldots \cup C_{i-1}^-$

Next, we have C =C^- if R/C_i is a chain, then it follows from corollary 3 that it is also true if it is not a 3-cycle, 4-cycle, or M_n. $C \cup C_{i-x}$ is an interval dominating.

When *R/E-x* is dominant, its image by *fx* is an interval of *R/E-x*. When *R/E-x* is dominant, its image by *fx* is an interval of $\acute{R}$ /E-x the interval dominant $\frac{R^-}{C^- \cup C_1^- - x}$

Because R^-*/E-x* of Cardinal is likewise an interval dominant of $C^- \cup C_1^- - x$, which is at least equal to Cardinal $C \cup C_i - x$ If $x \notin C_1^-$.

If x = C 1, then fx(C) = C, and fx (C_i -x) is strictly contained in C_1^-. R^- /C_i^-.

$C_i^- - 1$ possesses an interval of cardinal equal to card C i-, which is inconsistent with the proposition (4)

R and R^- are isomorphic if *R* owns the relations A1, A2, A3, A4, and As as borns, R and R- are (-1) hypomorphes, and *R* and R^- are two relations of the same finite base *E* of cardinal >5.

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