C:\J-Mensura \ Discret-Cont-YY

<< «Discretus» vs «Continuitas» >>

(1) Introduction

Some concepts and the respective reserved words and symbols are presented to avoid ambiguities.

1:1 Holons.

Usually the members of a set are referred as «elements» of the set.

The «elements» of the set of all football teams of the country are the «teams» but a «team» is a set of players which are the «elements».

The use of the neologism, «holon», will be reserved to be used instead of both «element» and «member», and defined as an indivisible entity in a given context.

In the context of football players these are «holons».

The concept of «holon» is of some heuristic utility when the members of a universal set are sets of various kinds and single elements and the same entity may or may not be divisible according to the context.

1:2 Homogeneity.

All corns in a bag where painted red, then the bag contains a set of corn «red homogeneous » and the set can be considered a «specie» with a very definite propriety.

The corn received where furnished by the supplier John&Co and are also «John&Co homogeneous».

(2) Types of Homogeneity

As an example, let UT be the universal set of types under consideration usually a finite number of members.

Tx is a subset of UT where x is a given name to that subset.

UT = [t1,t2,... ,tn].

xA = (Ht1,Htt4, Htn) and xB = (Ht1,Htn) and xC = xA+xB = (Ht1,Htn)

All real problems that imply the construction of a subset of UT do not comply to the observation that the union of different subsets will reduce the final homogeneity.

If the problem is to certify that all seeds under observation are absolute free of fungus-F then it may be necessary to examine separately each seed and only then the set may be considered fungus-F free.

But if the objective is to transport the bags which where filled by the same machine and can be considered members of a specie which members are H-weight.

The «holons» are bags and not grains and bags are not H-Fungus.

Some examples may help.

Sets including people of various cultures and habits, sets of various religions, random choices of aggregates of people with different cultures and social status or sets with very low cardinals.

(3) Extensive and Intensive Variables.

Extensive Proprieties

Time, space, mass, energy, fugacity, entropy, cardinal of a set, number of people, cars, number of € are «extensive» proprieties.

Normally, the formal space of these variables must be endowed with an addition connective (+).

Both integer and real spaces satisfy this requirement and the inclusion multiplication (x) is also possible.

The inverse of (x) and (+) can be included with real numbers but (x) can not be used with integers.

Some examples are well known : time, space, masse, energy, entropy and also quantity of money, value of mans work, economic production and consumption.

Extensive variable are referred as « quantity of XX».

The reserved symbol, Q:&, will be used to represent extensive variables and the symbol & may be a word, number or a symbol, e.g. Q:volume or Q:Members..

The discovery of a new extensive variable is always very significant.

Intensive Proprieties.

An intensive function is the relation of two extensive functions.

Some typical examples are: density = masse / volume, power = energy / time, velocity = extension / time, temperature = energy / entropy, price = cost / mass or total cost / number of articles.

The reserved symbol , I:&/&, will represent an intensive variable and &/& is an ordered pair of extensive variables, e.g.: I: Energy / Time.

The discovery of a new, I:Qj/Qk, implies the discovery of both Qj and Qk.

The discovery of entropy took some time because temperature, It, and energy, Q:j where known but Qk was unknown but finally a name was given to Qk, entropy that permitted I: temperature = Q: enery / Q: entropy.

Very small variation or point values can be written as follows :

I: temperature =,Q:energy / Q:entropy = ∂ Q:energy / ∂Q:entropy-

or δQ:energy = I:temperature x δQ:entropy.

(4) Point Values and Discrete Sets.

Economic Space is a discrete space and it is a permanent problem to embed it in a continuous space.

Index IFO measures the industrial managers level of satisfaction of the business, I:econ and Q:export was the last month country export and the number of members on the export business are Q:memb

A thermodynamic image can be made where I:econ would be the temperature, I:econ and Q:export would be energy and Q:memb would be entropy.

The economic relation is I:econ = Q:export / Q:memb and corresponds to the thermodynamic relation I:temperatur = Q:energ / Q:entrop.

If there are no members in export business or just 1 or 2 is it reasonable to apply the economic relation ?.

Is it legitimate to apply the formula I: econ = ∂ E:expo / ∂Q:memb when the number of members is <1000 ?

(5) Data Models and Heuristic

(5.1) Data Collection

Every body collects data using telephones and similar instruments.

The people reaction is three fold : they answer the questions, they are incapable to answer the questions or they slam their telephones.

Let the total number of telephone calls be 2500, the questions properly answered 1900 and only these were duly processed.

If this method is used repeatedly then the results are quite consistent and everybody feels that the method used is a good and sure.

Some doubts are justifiable.

The universal set does not look homogeneous and can be split in 3 parts : the answering ones, the incapables of answer and those who slam the phone.

Never the less the method disregards the second and third parts.

Repeatedly measuring the same universe with a faulty instrument gives consistent results but all faulty.

The fault is generally due to imperfect «heuristics».

(5.2) Languages

There are at least 3 sets of languages:

LG:D, to describe the collected information,

LG:H, the heuristic languages,

LG;F, the many model formal languages.

(5.3) Languages Heuristics

The scope and tasks of heuristics will be enlarged to cover functions that are not referred explicitly and nobody is responsible.

(1) verifying if the data collected is sufficient and satisfies the main objective of the program. Execute the translation of the information contained in LG:D to LG:H.

(2) verifying if the translation of LG:H into LG:F is correct and maintain the objective of the program.

(3) verifying the formal model, the output of the computer and if he general objective of the program was attained.

(4) keeping track of changes that may have been inserted in (1), (2) and (3).

(5.4) Relations Type 1-1

Let an information, F, written in language L1 be translated to language L2 and the resulting translation is : F* = Tr12(F). (n1)

Reverting the translation, let Fa** = Tr21(Fa*); (n2)

If F** = F then (Tr12, Tr21) is 1-1 relation for F. (n3)

If expressions in (n3) applies to all F in a set, Sf and if Sf includes all information written in language L1 or L2.

It is very rare that two languages, L2, L2 , have a translator of type 1-1 . if they are not written in a formal language.

(5.5) Operator Reversibility.

Observation and measuring instruments are non reversible operators and the usual method to verify their good function is comparing their images of the entity under observation are similar , vide equal, to those obtained by a referential instrument.

The transport of information and respective translator are of type 1-1 to enable the retroversion and the control of the operation.

The conversion of data language in computer language should be always be executed by an 1-1 translator and the control of all these conversion processes is the main task of the heuristic technicians.

(6) Summary

All formula I:econ can be translated to I:temp but not the inverse operation.

Point values is a concept that have no real meaning with discrete sets.

Economic science universal space is discrete.

Thermodynamics universal space is continuous.

Quanta mechanics is intrinsically discrete, based on [0 ,1] variable.

Fuzzy sets where designed to process discrete data

Economic science universal space could be embedded in a quanta mechanics space or in some type of fuzzy sets spaces.