International Journal of Mathematics Trends and Technology
ISSN: 2231 – 5373 /doi:10.14445/22315373/IJMTT-V67I8P511

Volume 67 Issue 8, 88-102, August, 2021

Modernization of Scienttific Mathematics Formula In Technology

Prof. Dr. Iwasan Kejawa, Ed. D

Miami Dade School of Engineering, Technology & Business, Department of Computer Science, Miami, Florida 33167-3418 US

Abstract **-** *Is it true that we solve problem using techniques in form of formula? Mathematical formulas can be derived through thinking of a problem or situation. Research has shown that we can create formulas by applying theoretical, technical, and applied knowledge. The knowledge derives from brainstorming and actual experience can be represented by formulas. It is intended that this research article is geared by an audience of average knowledge level of solving mathematics and scientific intricacies. This work details an introductory level of simple, at times complex problems in a mathematical epidermis and computability and solvability in a Computer Science. Research has shown that there are various ways of creating formulas and solving simple, at times complex problems. Explored. scenarios are introduced and answers are provided in this paper. Thorough ways of getting familiar with logic behind each situation of a critical problem solving has enable us to formulate techniques of creating mathematical formulas. This work also explained how the formulas presented can be solved to attain result. We must justify solving problems with the creation of scientific formula in technology.*

Keywords - *Mathematics, Engineering, Statistics, Computer Science, Aviation, Physics, Medicine, Astronomy, Transportation Analysis, Logistics, Technology*

I. INTRODUCTION

Problems are solved with techniques and these techniques may be in form of mathematical formula. To create mathematical formulas, one must represent objects and functions with variables.

FOR INSTANCE:

If 16 items are to be sold for 5 dollars each and 3 of the items are sold for 7 dollars each. What is the total price of all the items? How many items remain if only 10 of the items are sold.

Representations:

Let A = Total the number of items

P = Price of each items

T = Total price

Z = Remainder

S = number of items sold

Then

$T = AP$ or $A \times P$

$Z = A - S$

A = OBJECTS, P and S are functions. and

T and Z are outcomes or end results.

Solving for T and Z:

A = 16

P1 is the first instance which is equal 5

P2 is the second instance which is 7

S= 10

T1 is the total of first instance and

T2 is the total of second instance

T1 = (16 – 3) x 5 = $65

T2 = 3 x 7 = $21

T = 65 + 21 = $86

Z = A – S

= 16 – 10

II. ORDER OF CALCULATIONS SYSTEMS

To perform calculations in mathematics, it must be done by order of operation:

For example:

A + B(C-D)4 +Z

(C - D) ----------- First

(C-D)4 ---------------Second

B(C-D)4---------------Third

A+B(C-D)4-----------------Fourth

A+B(C-D)4+Z---------------Fifth

The acronyms for this example are the followings:

PEMDSA (Please Excuse My Dear Sister Anne):

(EXPONENTIAL, MULTIPLICATION, DIVISION, SUBTRACTION, ADDDITION)

PEMDAS (Please Excuse My Dear Aunt Sally):

(EXPONENTIAL, MULTIPLICATION, DIVISION, ADDITION, SUBTRATION)

Or

PEMDSA (Please Expect Me December Sunday Afternoon)

(Exponential, Multiplication, Division, Subtraction, Addition.)

PEMDAS (Please Expect Me December At Sun done).

(Exponential, Multiplication, Division, Addition, Subtraction)

III. PERFORMANCE EVALUATION FUNCTION

To create and calculate performance we will multiply activity by action.

Performance evaluation can also be regarded as combinations of action and object

Representation:

Let p = Performance, Action = A and Activity = B

P = A + B

For instance:

Imagine an automobile that travels at a constant speed of 80 miles per hour and it took 5 hours for the driver 5 hours to get to his or her designated destination. What is the over all performance of the automobile.

Since A= action and B activity

Activity = 80

Action = 5

Then

Overall Performance = 80 x 5

= 400 miles per 5 hours

IV. FUNCTIONS

A. ADDITION FUNCTION

Addition is the combination of two or more entities.

Representation:

A + B + ………n

Where n varies

For instance

Let assume we want to add six numbers OR more.

Then

Function (F1) = n1 + n2 + n3 + n4 + n5 + n6 + ... n

(F2) = (n1, n2, n3, n4, n5, n6, ... n

Example:

Subtraction Function

Subtraction is the elimination of two or more variables from an entity

B. REPRESENTATION:

A - b - . . . .n

C. FOR INSTANCE

We can eliminate or take away several entities or items from a Whole.

Thus

Function(F) = N – n1 – n2 – n3 - …….n

Example: To subtract the number 23 and 25 from whole number 100.

Function (F) = 100 – 23 – 25

= 52

V. MULTIPLICATION FUNCTION SYSTEM

Multiplication is the addition of a variable n number of times.

For instance

The addition of Y n number of times is

Y(n)

A. REPRESENTATION:

Function (F) = Y x n

= Y1 + Y2 + Y(n)

Example: To add a number 1000, 1250, 515 and 6000 series of time

Function (F) = 1000 + 1250 + 513 + 6000 = 8763

B. DIVISION FUNCTION

The division function is the partition of a whole (Y) of entity n into x number of times. It is the number of times n occurs in Y or the occurrence of n at x number of times.

C. REPRESENTATION

FUNCTION (F1) = Y / n

(F1) = n(1), n(2), n(3), n(x)

(F1) = x

Example:

To divide the number 12 by 2 will be

F = 12 / 2

F = 2(1), 2(2), 2(3), 2(4), 2(5), 2(6)

F = 6

VI. QUOTIENT FUNCTION SYSTEM

Quotient function is how many times an entity varies after the entity is divided by its divisor,

For Instance

Let assume N is divided by y at z times

A. REPRESENTATION:

FUNCTION (F) = N / y(1) X N / y(z)

Thus

y = divisor of N such that y x y….. z = N

z = occurrence of y

FUNCTION (F) = Z

Example: To find the quotient of a number 4

Function (F) = 8/2(1) X 8(2) X 8/ (3)

= 3

B. AVERAGE OR MEAN FUNCTION

An average function is the sum of a group of numbers divided by the number of times the numbere existed in the sum. The average function of six numbers represented as A, B, C, D, E, F would be for example be formulated as follows:

a) REPRESENTATION:

Average Function (F) = A1 + B2 + C3 + D4 + E5 + Fn / n

A, B, C, D, E, F = set of numbers

n = number of occurrence

Example:

An Average Function of a group of numbers or set of numbers 2, 4, 1, 3, 2 will be:

n = number of occurrences

y(1), y(2), y(3), y(4), y(n) = set of numbers

n =5

Example A:

An average function of a group of numbers 2, 4, 1, 3, 2

y(1) = 2, y(2) = 4, y(3) = 1, y(4) = 3, y(5) = 2

Average Function (F) = 2(1) + 4(2) + 1(3) + 3(4) + 2(5) / 5 = 12/5

F = 2.4

Example B:

Function (F) = 2 + 4 + 1 + 3 + 2 / 5

= 12 / 5

Average Function (F) = 2.4

VII. ROOT FUNCTION

Root function is the divisor of a number and when multiply by itself number of times is equal to the number.

Representation:

F = N/n(y) x N/n(y)

n = the divisor of N

y = number of times

Example. To find the root number of the number 16.

Function (F) = 16/4(1) X 16/4(2) X 16/4(3)

y = 4

VIII. EQUATIONS MODALITY

Equations can be categorized as (1) Simple Equation, (2) Simultaneous Equation (3) Quadratic Equation, (4) Monomial Equation (5) Binomial Equation and (6) Polynomial Equation. These equations can be regarded as functions:

- Simple Functions
- Simultaneous Functions
- Quadratic Functions
- Monomial Functions
- Binomial Functions
- Polynomial Functions

Simple Equations

These types of equations can be created by multiplying, dividing, subtracting or adding fixed numbers and variables. A simple equation function may be in the following terms, a fixed number n and variables y an x:

Representations:

i. F = ny

ii. F = n + y

iii. F = n/n + y

iv. F = n-y

v. F = n – y - x

The above examples are just possibilities of simple equation functions. There are a lot of simple equation functions.

Example: A

Let a given variable number be y and a fixed number be 8 and a function be equal 16. Now we can derive the appropriate possible simple equations.

n = 8

y=variable number

F = 16

The equations for the above example may be as follows:

1) 16 = 8y

2) 8y = 18

3) 8y/8y = 16

4) y = 2

5) 16 = 8 + y

6) y= 16 – 8

7) y = 8

8) 16=8/8+y

9) 8/8 + y = 16

10) 0 + y = 16

11) y=16

12) 16 = 8 – y

13) 8 – y = 16

14) –y = 16 – 8

15) $-y = 8$

16) $y = 8$

With example A, let set another variable x to be 3, then

17) $16 = 8 - y - 3$

18) $16 - 8 + 3 = -y$

19) $11 = - y$

20) $y = 11$

Example B.

Let a given variable be equal to 45 and a fixed number equal 65 with given function 3. What are possible simple equations?

$T = 65$

$r = 45$

$z = 3$

The possible number of equations for the above example can be enumerated as follows:

1). $45r + 3z = 65$

2). $3z = 65 - 45r$

3). $T = 65 - 45r$

z

Simultaneous Equations

These types of equations are formed with two different types of functions. Each function can be in form of simple equation. Both of the equations may also be in form of additions, subtractions, multiplications and divisions.

Representations:

i. $Ax + By = C$

$Dx - Ey = Z$

ii. $Ax - By = C$

$Dx - Ey = Z$

iii. $Ax - Ey = C$

$Ax + By = Z$

Iv $Ax - By = C$

$Ax + By = C$

Example A

If in a process, F1 = 10 and if a given number 4 is multiply by a variable x and added to a fixed number 2 which is multiply by a variable y. In another process F2 = 8 and a given fixed number 2 is multiply by a variable x and subtracted from a given fixed number 5 which is multiply by a variable y. Formulate the appropriate simultaneous equations for this scenario and solve for x.

Representations;

F1 = 4x + 2y = 10 ………………i

F2 = 2x + 5y = 8 ………………ii

Solving:

In other to arrive at a solution we can multiply equation ii by - 2 as follows:

4x + 2y = 10

(-2(2x)) + (-2(5y)) = (-2(8)) which will be equal to:

4x + (-10y) = 16 OR 4x – 10y = -16

Both equations can be represented as follows:

4x + 2y = 10y…………………i

-4x – 10y = 16………………..ii

We can now eliminate x and solve y by subtracting equation i from equation ii.

THEORETICAL APPROACHES

The approaches of solving problems or predicaments are what mathematics functions convey to the world of science. It is imperative that hypothesis be analyzed concluded and integrated. The problem of science is that sudden approach is realized with substances and sudden beliefs.

Eliminate Method

4x + 2y = 10y …………..i

10y = 16…………….ii

Substitution Method

4x + 2y = 10y…………..i

10y = 16…………ii

x = 0 ……………………..iii

Integration Method

4x + 2y = 10y……………i

10y = 16…………..ii

x = 0……………………….iii

y =2

APPLICATIONS OF FORMULA

The applications of agents are the willingness to control the situations around the globe. In order to adversely reduce example nary proprietary. The implementation of the innovative process will have to have an impact on the behavioral of the populace. One of the technicalities of eradicating the impact is to limit or not to invigorate exposure of the substance to the population as interim cause for activity.

The scientific applications involve the introduction of the technicality to acquire necessary skills, experience and practice. The provisions of the entities will certainly improvise the business of doubt

Problem solving can be attributed to intelligent systems as well to expert systems. The systems generally play a role in behaviorism and in artifacts. The perpetuation of objects may lead to its resilience and its functionalities. The capacity to which a subject is represented depends solely on the functionalities of the issues. It has come to a place where artifacts are considered as live embodiments. Living objects and non-living objects are subjected to rigorous understanding of their environment. For example, a streetlight knows when to turn off and turn on when it is dark or when there is a bright environment. An object is subjected to scrutiny when the justifications are beyond control of behold. A form of participative objectivity is derived from subjective activities of the living objects.

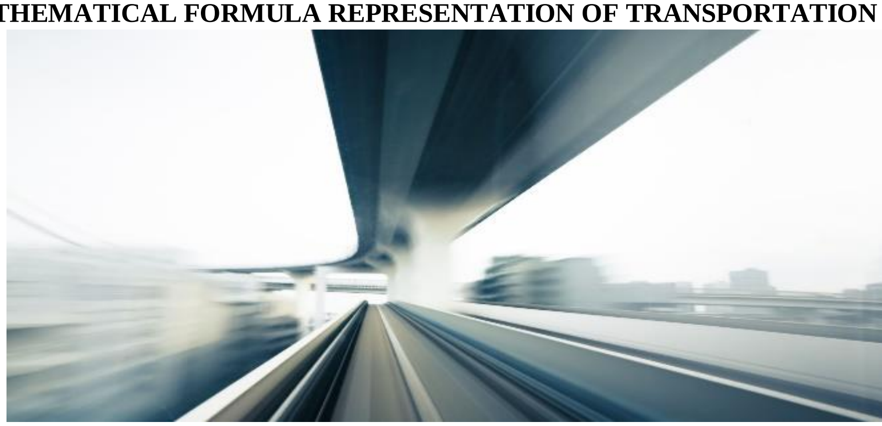
The knowledge instilled in living can be represented as artifacts. So also, can non-living entities be represented as living entities, thus our world existed in learning and conveying knowledge with the aid of the living and non-living, this justification will make us believed that artificial intelligence and experts' systems are both interchangeable. The complexity of acquiring knowledge is based on the sophistication of learning endeavor.

The situations of understanding lively artifacts and the process of creating physical paradigms remain a soul entity in the ages of expert systems and artificial intelligence. Approach of these subjects is subjected to the soul of soul of the era of Plato and Socrates. The breath of the mind is the elongation of physiological, psychological, sociological parabolic entities of our times. Those entities with positives and negatives thoughts can be transferred to non-livings and livings. But these means there are sensitivities between non-living and the living.

This leads us to an example of moveable objects in world of today. Moving objects depend solemnly on the encumber ants of the beyond. Transportation model, another example of serving the purpose of experts' systems and artificial intelligence is dated back to the stone age of vulnerability and adaptability, which is religiously expressed in various religion peripherals, memorabilia

An instructional modality may serve to accomplish a goal and eliminate instances of confrontation between two subjects. A transportation problem analysis as opposed to agricultural and household analysis may justify the generality of instances where physical entities need to be moved between one point without any disruptions or discrepancies.

IX. MATHEMATICAL FORMULA REPRESENTATION OF TRANSPORTATION SYSTEM



O1 = Departure

O2 = DESTINATION

/ = Boundary between the two points

Z = Sailor or Driver or Pilot

Y1 = Object 1

Y2 = Object 2

Y3 = Object 3 & Object 1 (object 3 causes deadly to object 1)

O2 = 0 WHEN O1 = Z + Y1 +Y2 + Y3

O1 = Y3 + Y2 WHEN O2 = Z + Y1

O2 = Y1 WHEN O1 = Z + Y2 + Y3

O1 = Y3 WHEN O2 = Z + Y1 +Y2, O1 = Y2 WHEN Z = Y2 + Y3

………………………………………………………………………………

O2 = Y1 WHEN O1 = Z + Y2 + Y3, O2 = Z + Y3 + Y1 WHEN O1 = Y2

6

O1 = Z + Y 3 WHEN O2 = Y2 + Y1

Finally, O1 = 0 when O2 = Z + Y1 + Y2 + Y3

There are 16 possibilities and 10 movements or instances in this scenario.

The surveillance of destructive elements needs to be addressed to obtain a goal or to accomplish a mission.

An instance when a fisherman has a boat, a rabbit, a dog and a cat and need to transport them across a river with any fatal incident is an abominate analysis of the intelligent systems. In this scenario the fisherman cannot carry more than one thing in the boat at a time. And if the rabbit is to be left a alone with the cat, there will be an altercation between the two that may lead to the dead of the rabbit. This scenario needs to be examined to determine the ways to solve a problem. The mathematical analysis of the transportation problem described previously in this text is an example of the solution to the fisherman problem.

The solutions to the fisherman problem can be discussed in a layman approach. First the fisherman needs to carry the rabbit across the river and leave the cat and the dog alone. Next, he needs to leave the rabbit alone at his destination and comeback to carry the cat. He then needs to leave the cat at his destination and carry back along the rabbit.

Next thing for him to do is to carry the dog across the river and leave the rabbit alone at the source location. After he gets to his destination, he is then to leave the dog with cat and comeback to carry the rabbit. This will complete his mission without any problem between or with the species.

X. BLOCK DIAGRAM FORMULA

A

A1

A3

Z1

y

Z

Yz2

yZ3

yZ4

XI. ARTIFICIAL INTELIGENCE USAGE

Artificial intelligence is the representation of human knowledge by machines or objects. Objects are devised through expert system to perform various human functions or sophisticated tasks that cannot be performed or difficult to be performed by humans.

Computers may be referred to as artificial intelligence or expert systems.

The various usages of Artificial Intelligence can be enumerated as follows:

a) Business

b) Engineering

c) Manufacturing

d) Farming

e) Mining

f) Schools

g) Hospitals

h) Households.

1) The Representation of commonsense Knowledge. (ROBOTS)

a) Automobile manufacturing (Such as in assembling and driving).

b) Operation services (Such as in household/office chores, Errands deliveries.)

2) Language Understanding. (ROBOTS AND COMPUTERS)

a) Interpretation of simple questions and commands (Electronics

Manufacturing, such as in recording machines and voice recognition

analyzer.

b) Operations Services (Such as in Hospitals, households and schools)

3) Image Understanding.(ROBOTS AND COMPUTERS)

a) From Images to Objects Models (Such as in schools, engineering, farming,

Hospitals and business)

b) Computing Edge distance recognition (Such as in engineering

c) Interpretations of Images and surface Direction. (Such as in farming, engineering, Hospitals and business)

X. ARTIFICIAL INTELLIGENCE IS CONCEIVED THROUGH THE FOLLOWING MODES OF LEARNING: 1) Learning class descriptions from Samples.

2) Learning rules from Experience.

3) Learning form from functional Definitions.

XI. CONCLUSION

The problem of the fisherman transporting his dog, rabbit, and a cat across a river without LEAVING THE CAT WITH THE RABBIT AND HE MUST NOT CARRY MORE THAN ONE ITEM WHEN CROSSING. His problem can be solved by the mathematical transportation formula provided earlier in this article. The formula can also be applied to a farmer's problem, where the farmer possesses a grain, goose and a rabbit and he needs to transport individual species to the farm without LEAVING THE GOOSE WTHE GRAIN and must not carry more than one item at a time

According to these scenarios, the farmer must not leave vulnerable item with dangerous item and if the farmer leaves the goose with the grain the goose will eat the grain and must not carry more than one item at a time between the species which may result in the death one another.

To solve this problem the farmer must leave the rabbit and goose at his departure and take the grain to the farm when he gets to the farm he must then come back to get the goose and leaves the rabbit behind, leave the goose at the initial departure and take the grain to the farm and then come back to get the goose and this will complete journey Now the four of them are at the farm.

Let: O1 = Departure

O2 = DESTINATION

/ = Boundary

Z = Transporter

Y1 = Object 1

Y2 = Object 2

Y3 = Object 3

Note: object 3 causes deadly harm to object 1

START/BEGIN JOURNEY

O2 = 0 WHEN/ O1 = Z + Y1 +Y2 + Y3

O1 = Y3 + Y2 WHEN/ O2 = Z + Y1

O2 = Y1 WHEN/ O1 = Z + Y2 + Y3

O1 = Y3 WHEN/ O2 = Z + Y1 +Y2,

O1 = Y1 WHEN / 02 =Z + Y2 + Y3

……

O2 = Y1 WHEN/ O1 = Z + Y2 + Y3,

O2 = Z + Y3 + Y1 WHEN/ O1 = Y2

O1 = Z + Y3 WHEN /O2 = Y2 + Y1

END/Finally at destination

O1 = 0 when/ O2 = Z + Y1 + Y2 + Y3

There are 16 possibilities and 10 movements or instances in this problem.

Other example or scenario is the Locksmith without air conditioner with his belongings and solar system and a dog which he must transport everything to a new city. And he is to travel without leaving his dog with anyone; must not take no more than one item at a time and there may be a tornedo in the city of his departure. If he leaves the dog alone in the house, it may be too hot or cold which may cause the death of the dog or sickness if there is a tornedo. Applying the fisherman and the farmer previously described, this problem can also be solved.

REFERENCES

Various mathematical entities were explored in conducting these studies which include.

[1] Hegger R, Kantz H and Schreibe T, Practical implementation of nonlinear time series methods: The TISEAN package, Chaos, 9, 413, (1999). :
[2] Kejawa, I & Kaplan, A, Mathematical Intelligence: the arts of critical thinking, AmericanStarbooks LLLP., (2014).
[3] Kejawa, I Mathematical Fundamentals: the principles of Algebra, Amazon.com., (2016).
[4] Kejawa, I Etiology of Professes. Societal Education Leadership, Amazon.com., (2017).
[5] Madhukar Krishnamurthy., Mathematical Analysis of Hymns for Meditation International *Journal of Mathematics Trends and Technology*, (2020) 1-9.

ACKNOWLEDGEMENT

Gratitude to all the contributors of to this paper, directly or indirectly; thanks to the entire faculty of the Department of Mathematics and Statistics at the Bernard M. Baruch College, especially Professor Radu Diacunescu, Professor Mariam Dologite and Professor Skurdena.

To the faculty of Computer sciences of the School of Engineering at the City College of New York of the City University of New York, and the Miami Dade College students and faculty. I also applaud the faculty members that guided me through my post graduate courses in Management at the New York Institute of Technology.

To the faculty school of education at Nova Southeastern University for all their efforts during my affiliation as a doctoral candidate the University.

I am very proud of my entire pupils and students at every level of mathematical skills at the Palm Beach County School District their understandings, dedications, patience, at times rigorous criticism and hard work. I would like to express my thanks and sincerity to the staff and faculty of the Fischer School of Education and Human Services of the Nov the Department of a Southeastern University for the knowledge I acquired during my affiliations with the institution.

As it is often said, “A friend in need is a friend indeed”, vice versa. Special thanks and gratitude go to all my friends, family, and relatives.