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ERROR MINIMIZATION IN NUMERICAL ANALYSIS SYSTEMS

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ABSTRACT
The process of modelling algorithms and physical models on natural science remain prone to various errors. Apparently, these errors are related to the non-stable nature of the variables deduced from these fronts. Such distinctions allow for the embrace of various errors in the process of developing numerical analysis and the eventual models associated to the factors. However, an insight on the respective values allow for the consideration of possible avenues that may be used in the mitigation of their occurrence. The study focuses on a numerical process that models a natural concern. It proceeds to illustrate the possible variation that may exist with respect to the tabulation of the considered formulae, and the eventual implication in the accuracy of the final finding.

KEYWORDS: analysis, Error minimizing, Numerical analysis,

INTRODUCTION

Computer science remains the most considered field in the application of numerical analysis. Such a believe may be based on the increased usage of the systems in this area, as well as the eventual interest of integrating numerical solutions to the science of continuous mathematics. However, modeling under numerical analysis for the concept embraced under natural science has been a problem with regard to the accuracy. Arguably, the proposed solutions or equations that seek to offer the exact values are still regarded to not being precise. The usage of realistic mathematical models in the deduction of the respective solutions seems far-fetched from the primary opinion of non-regarded analytical assumption (Liang & World Scientific, 2013). It may be further argued that computing technology has allowed for the development of comprehensive numerical analysis solutions. However, the importance of relevance and accuracy with respect to the models remains regarded as an ideal concern in the area. Such is with respect to the diversity of the proposed algorithms and the subsequent diversity of natural science.

Reading from the advancement in natural science, analytical analysis desire to incorporate differing commands while pursuing the address of shared challenges. Such an assumption may be proposed with respect to the diverse nature of the variables related to natural science (Liang & World Scientific, 2013). The area of the earth remains the best illustration of the aforementioned sense of diversity. The first challenge in regards to relevance is sourced from the non-steady value of π (Ugai, Yagi & Wakai, 2012). The value is considered as a progressive digit that is, usually, rounded off at considerable interjections. This implies that the level of interjection achieved in its definition seems to vary across the model considering the problem of modeling a numerical assertion on the field of the earth; the differing π may eventuate into not being the only source of challenge for the entire process.
The ideal equation that is used for the determination of an area of a spherical object involves the assumption (Zhang, 2014).

$$A = 4\Pi r^2$$

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Apparently, the argument aligned to such an assumption remains vested on the information it seeks to decipher. The formulae represents the proposed numerical modeling for any sphere. Such a revelation allows for the conceptualization of the possible errors that are configured under the system (Pardo-Igúzquiza et.al, 2013). The statement, “any sphere” seems to be holding the ideal magnitude of concerns that stands to establish challenges in the equation of a numerical analysis algorithm to cover the challenge (Krisp, 2013). Such remains envisioned irrespective of the unsteadiness associated to the Π value. Additionally, the concern of formulae being standard seems to be proposing of its progressive usage across the address of the challenges of all the spheres (Oh, Kim & Jeong, 2014).

$A = 4\Pi r^2$ remains the standard equation for the elucidation of the considered volume.

Such implies that earth will have to be tweaked slightly to offer the ideal solution regarded for the test. In this regards, the equation may involve placing a critical distinction to the primary formula (Eichinger, Pankratius & Böhm, 2014).

$A = 4\Pi R_3^2$ may be considered as numerical equation that may capture the area of the earth.
In the equation,

A represents the area
Π the pi value
While R_e singles out the radius of the earth

The last variable remains the centre of concern. Apparently, the earth is not as spherical as considered in the equation. The values of the radius seems to differ from the point of consideration (Allemang, De, Niezrecki & Blough, 2012). The equator (east to west distance) has a smaller radius as considered in the inter poles (north to south distance). Such an observations remains regarded as the primary concern towards the discrediting of the possible numerical assumption that may be modeled to achieve this interest (Faires & Burden, 2013).

The paper will focus on the model in the elucidation of the possible angles of errors that may be envisioned during the generation of numerical analysis models that seek to isolate the single concerns. There seems to exist numerous sources of challenges that may be anticipate while modeling for the various numerical analysis. Such may be regarded to the process that involves the presentation of the considered attributes.

MATERIALS AND METHODS

The study on the errors that are aspired under the concern of numerical analysis on physical models will narrow on the aforementioned challenge, the area of the earth. The modeling will involve the generation of the possible valuables that may be achieved via the aid of the standard formulae for the determination of the area of a sphere. Such will be aligned with respect to the advancement of the two variables in the dissemination of the considered values for the radius at differing points. The eventual interest of the study will be captured on the eventual models of values that will be fed to the system. In the hope of mitigating the field of errors, the Π will be set a distinct value. Such will allow for the variation of the reading in respond to the changes noted in a single reading. Six readings will be made in a manner that will allow for the graphical representation of the noted variation. The graph will be utilized in the presentation of the possible non-steadiness that may result from the usage of the model.

RESULTS AND DISCUSSION

Tabulated findings from the respective variation that may be associated to the radius value of earth.

Table 1: *Tabulations of the Area of the earth for all the speculated radii*

			$A = 4\Pi R_3^2$			
R_3 (in KM)	6353	6357	6366	6371	6378	6384
A	507186370.9	507825245.2	509264182.6	510064471.9	511185932.5	512148164.7

Radii developed from the differing assumptions that are related to the earth with respect to the various calculations. There exists no standard radius of the earth, hence the variation

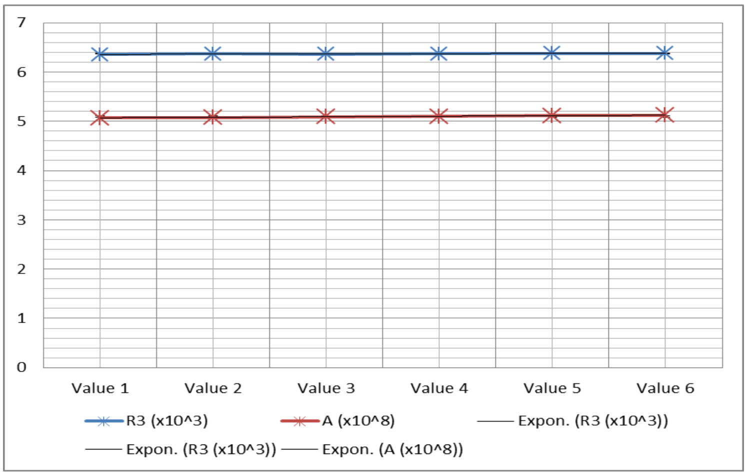

Figure 1*: linear curves of the respective values of radii and earth. An insight on the possible gradient expressed by the values may offer detailed presentation on the considered error in tabulation.*

DISCUSSION

The process of developing a numerical analysis protocol on the area of the earth will have to comprehend the entire sets of variations that may be achieved from the considered factors. On this behalf, developers may eventuate into having differing findings and results. Such observations may be regarded to the non-constant nature of the variables under natural science (Fernández-Prieto & Sabia, 2013). Apparently, the process of evaluating the radius of the earth is challenged by the differing topographical differences regarded to its surface (Khennane, 2013). The ultimate implication associated to such observation remains accredited to the impact it offers to the proposed process of simulation. Computing the concerns under natural science remains akin to the process of simulation (Zhang, 2014). However, the study assists in portraying the constant difference that is associated to the concern. Additionally, there exists a number of factors that may regarded as positive towards the challenging of the deduced findings.

CONCLUSION

The process of developing numerical variables to assist in the subsequent analysis of the considered challenges in natural science remains attributed to various challenges. Fathoming the intensity of such challenges remains central to the success of the developed physical models. There exists an increased number of factors to be considered prior to the proposal of an algorithm under the numerical analysis. However, developers may skirt such concerns via the integration of their respective inputs in the respective models.

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