Database of Physical Constants and Equations

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1 Functionality and Overview

The web service that we plan to create and pair with our database, is intended to have several functionalities to aid the user in doing physics calculations. One of the main functionalities of our web service is to allow users to search for the value of various physics constants by either entering its name, symbol or even the field of physics to which it belongs, in order to list all of the constants that pertain to the field. In addition to simply finding the value of constants, our web service seeks to enable its users to pull up a list of all the equations that use a given constant. Aside from dealing with physics constants, the users are also given the ability to bring up equations based on variables that they contain. This can be a powerful tool for the user, allowing them to give several variables that they have the value of and one that they don't, in order to find the proper equation to use in their given situation. The web service will also be able to inform the user whether the equation is a differential equation or a polynomial equation, along with giving additional attributes that pertain to each of those equation types. The user will additionally be able to figure out which physicist was behind the creation of the equation and some information about him/her. Other than the creator the user can search for which field of physics a given variable, constant, or equation is a part of. This could be quite helpful to the user in identifying and understanding foreign material. As a whole this web service provides a handful of useful tools that will allow the user to work more efficiently and knowledgeably.

2 ER Diagram

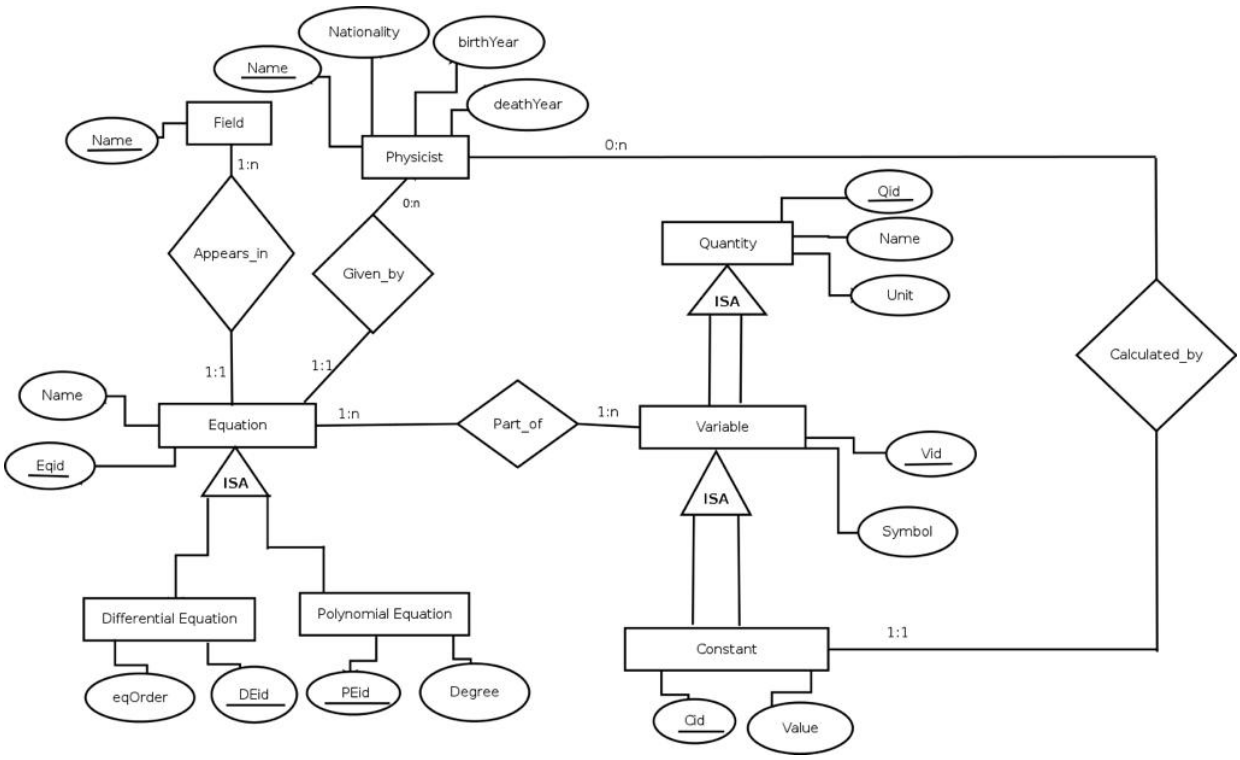

Figure 1: ER Diagram

3 User Interaction

As stated earlier, our web service primarily focuses on letting the user search for constants and equations present in our database. The user will see a search bar on the homepage with options to filter the result. This allows the user to search for equations which appear in a particular field and also specify more constants and variable to narrow down their search result. The result will be presented in a format of a list and the user can choose the equation they are looking for. The equation will also have information depending on its type. If the equation is a polynomial type then the user will be

provided with degree of the expression and, if its a differential type then the order of the equation will be shown. Furthermore, the user can also view general information about the physicist associated with the equation/constant. Additionally, the website may potentially include a feature where the user, after searching for the equation, can compute the result by entering their values for the variables. As for illegal input, the web page only takes constants and variables and all other types of input would be considered illegal. For example, the user will not able to input an equation in the search bar as it defeats the whole purpose of the project.