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**PYTHON FINAL PROJECT OVERVIEW (Spartan Cal)**

In Ashesi University, students are being placed on tracks of either College Algebra, Pre-calculus, Calculus and students offering Engineering are exposed to more scientific methodologies in their area of study. I realized that during in class activities, classes tend to delay as tutors and students take most of the time finding formulas to solve mathematical expressions. Also solving scientific expressions tend to slow the pace of the class. This may be because of students forgetting such formulas or they are solving it in a book delays the lesson as well.

This is something I find a problem to care about and therefore I have developed a software named Spartan Cal using python to harbor several mathematical and scientific formulas for calculating many scientific and mathematical expressions. With this application in action, tutors and students no longer need to strive finding formulas to expressions given.

Firstly, the project features concepts discussed in class. The concepts would be explained by paragraph with respect to the chapters later. The “Spartan Cal”, is easy to understand and easy to utilize by the user. Firstly, when the program is launched, it issues out an introduction message on the screen to the user. The main purpose is to inform the user about the program and some notifications to be aware of as far as the Syntax of the language is concerned. Another interesting figure in the Spartan Cal is that I have included independent tables which features relevant information users need to be aware of when using the program. These are Conversion table, Mathematical and Scientific formulas the program covers and Respective functions such as Quadratic, Linear, Logarithm, etc. To make the program easy and lovely to utilize, all the formulas the program covers has been stored in a module. This module has been implanted in the program which when launched automatically imports itself. Let’s now delve into the application aspect. Here I am going to explain the aspects of my program which highlights areas studied in the Chapters of the course.

**Chapter 1**. In the first chapter, Programming is being introduced on a large scale. The aspect which I applied was the understanding of the concept of programs and the creation of modules, which was explained in detail especially the modules aspect.

**Chapter 2**. In the Chapter 2, the concept, I applied in my project, was the analysis of the Software Development Cycle. This concept has been helpful to me from the very first beginning to this time of the program because after identification of the problem, I constantly tested and debugged the program as well as updating the software to meet the changing needs of the user. The chapter also talks about the use of variables, employing of the newline tag, Assigning Inputs. Variables were used in my program to represent the various functions and formulas. The newline tag was also used in my program to space out the program to avoid complexity in the program. Assigning of inputs was also used in my program to demand for inputs from the user.

**Chapter 3**. Since my program is about calculations, this chapter was effectively utilized in my program. The concept of numeric datatypes was utilized. Here, the program harbors area where user enters an input into the parenthesis. These inputs entered was either an integer value or a float type. Also, the operators were effectively utilized in my program. This was used for the writing of the various formulas. The math library was also used in my program. Here with the math library, I was able to make the calculation of some math concepts very possible. Here, I used the round type to approximate large numbers and the use of the int and float conversions to find the operands of values.

**Chapter 5**. In this chapter, I utilized the use of indexing very effectively in the creation of the tables. With the indexing, I used the first character of the input values in the table to serve as the borders for the table. The string method length was also used to serve as the length of the tables to make sure that it can harbor the entire data in it. With the lists, I created variables to harbor the concepts in the tables. I also applied the string method upper () which convert strings written by the user into uppercase inorder for the program to be launched.

**Chapter 6**. Due to the complexity of my project, I employed massively the use of functions to create orderliness in my program. With the functions in place the user need not play much role in the program. To accomplish this purpose, I created individual functions for each formula. The main reason was that with the use of the functions in play, the function makes things very easy for the user to navigate. Here the syntax for the formula pops up on the screen and the user needs to only insert in the required input in the parenthesis and that’s all, the answer is then printed out based on the parameters entered. I also applied the concept of function in a function. Here, I created a module called Tables.py which harbors the function called “conversiontable” this function entails all the source code for the creation of the table. I therefore incorporated it in the main function which made it possible for the table to print out when the main function is invoked.

**Chapter 7**. Since, my project reflects the concept of choice to the user as to whether what calculation to perform, this concept was also useful. With the decision structures, I employed the multi decision statement. Firstly, an input is derived from the user as to whether the program should be launched or not. The nested if concept is utilized here in the sense that if the user enters “no”, it pops a question to ask again if the user is sure of his/her choice to end the program or if the user enters” YES”, the program officially launches. The multi way decision structure is also utilized here, where after the launch of the program, it askes the user which calculation to perform.

**Chapter 8**. As a student programming a calculator, I realized that when the user in the process of performing calculations, they would need a structure to help give them the opportunity to perform calculations consistently. So, I involved the loop structure. To talk of the application, I included the “for loop” and set the range to a high number, which functions in a way that after one calculation Is performed, it automatically, prints out a statement for the user to perform another calculation consistently. The “for loop” also was made evident during the structuring of the tables. Here, because I wanted the table to print out the content in an orderly manner, after creating a list to harbor the data, I set a loop variable to loop through the list and, with the help of the indexing and length function of the entire data, the table was able to print out in an orderly manner.

**PROJECT PICTURES**

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