SOEN 6011 Project - Calculator

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This document is shows basic understanding on the functions that is used in Calculator:

Function:

Given functionality for calculation is a^{b^x}

Definition:

As per the given function, a and b are real constants and x is a real variable. Real Constants are real number which can be positive, negative or zero, which are fixed values. Whereas Real variables are not fixed values, which may change due to environment. In this project we are calculating the a power of b and b power x.

$b^x = b*....*b$ which is x times

lets says the above value is $c = b^x$

$a^c = a*....*a$ which is c times

Domain and Co-Domain of function:

Domain of the power function depend upon value of the power x and b^x

Case 1: p is a non-negative integer = then domain is all real numbers

Case 2: p is a negative integer = then domain is all real numbers not including zero

Case 3: p is a rational number in lowest terms as r/s and s is even = then when p>0 domain is non-negative real numbers, when p<0 domain is positive real numbers

Case 4: p is a rational number in lowest terms as r/s and s is odd = then when p>0 domain is all real numbers, when p<0 domain is all real numbers not including zero

Case 5: p is an irrational number = then when p>0 domain is all non-negative real numbers, when p<0 domain is all positive real numbers

Characteristics:

The properties is known as Exponents power rule

For example: a^{b^x} is also can be written as $a^{(b^x)}$
Since a and b are constant lets say 3 and 2 respectively
Where as x are variable it can vary lets say 4

So the above example can be written as 3^{2^4} or $3^{(2^4)}$

so the result is $3^{(2*2*2*2)}$ that is equal to 3^{16} which is $3*....*3 => 16$ times