Identificación del problema y análisis de requerimientos

Caso de Estudio:

Cliente	Universidad ICESI
Usuario	Teacher Apo 1, Nicolas Salazar Echeverry
Requerimientos funcionales	RF0: Function Menu RF1: Cosine Method RF2: Bisection Method RF3: Absolute Value Method RF4: Pow Method RF5: Factorial Method
Contexto del problema	The program should manage the verification of a function using the bisection method. In addition, it should have a recognition system or menu that recognizes which action the user wants to perform and which equation to solve, depending on the number of times they want to consult. On the other hand, the system must recognize each of the operations: (factorial, absolute value, exponentiation, and cosine) without any library. The execution of the bisection method requires that, through an interval or search range assigned by the user [a,b], it encapsulates the approximation of the real root of the function and subsequently the value of the same, depending on the number of iterations that the program acquires..
Requerimientos no funcionales	RFN0: Execution: The cosine method and the functions should be executed correctly, reaching an approximation RFN1: Bisection method correctly executed according to the Taylor series RFN2: The search interval must encapsulate the real root of the function, depending on the assigned option. RFN3: It should have the ability to perform the necessary validations for its development.

<table>
<tr><td>Identificador y nombre</td><td colspan="3">[RF0-Function menu]</td></tr>
<tr><td>Resumen</td><td colspan="3">The system must allow the user to choose through a menu of options, using the input 'option' from 1 to 4, which function they want the program to perform, or to exit the program. The program will evaluate through a conditional statement which option is valid according to the operation to be performed.

1. y = 2Cos(x²)

2. y = 3x³+7x²+5

3. y = xCos(x)

4. Exit</td></tr>
<tr><td rowspan="2">Entradas</td><td>Nombre entrada</td><td>Tipo de dato</td><td>Condición valores válidos</td></tr>
<tr><td>Option</td><td>Int</td><td>- Integer numeric values.

- No characters allowed

- Values from 1 to 4.</td></tr>
<tr><td>Resultado o Postcondición</td><td colspan="3">The chosen option will be stored to later verify the process to be carried out.</td></tr>
<tr><td rowspan="2">Salidas</td><td>Nombre salida</td><td>Tipo de dato</td><td>Formato</td></tr>
<tr><td>not applicable</td><td>not applicable</td><td>not applicable</td></tr>
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Identificador y nombre	*[RF1-Cosine Method]*		
Resumen	*.The system must allow the user, by means of a method, to obtain the approximate result of the cosine, according to the value of x that is assigned to it. The main method will be assigned with other functions that compose it: (Factor and power of the base), which allow the operation to be carried out. This, through a Taylor series.*		
Entradas	**Nombre entrada**	**Tipo de dato**	**Condición valores válidos**
	x	double	*- Numeric values (decimal)* *- No characters allowed* *- No spaces between numbers* *- The call to the function must not be empty.*
Resultado o Postcondición	Performs the corresponding operation of the function, displaying the approximate result of the cosine.		
Salidas	**Nombre salida**	**Tipo de dato**	**Formato**
	resultcos	double	Numeric (decimal)

Identificador y nombre	*[RF2-* Bisection Method*]*		
Resumen	*The system must execute the bisection method according to the Taylor series. Depending on the option chosen by the user, the program will choose the function to solve:* *2*cos(x2): f1(x)* *3x3+7x2+5: f2(x)* *x*cos(x): f3(x)* *The method finds an approximation of the root of the function on the interval [a, b]. Considering the value a, as a minimum, and the value of b, as a maximum, using a root search technique. In the implementation of the operation, the bisection method would be used, calling the chosen function.* *to meet this requirement in a general way, a possible approximation of x(c) is reached.*		
Entradas	**Nombre entrada**	**Tipo de dato**	**Condición valores válidos**
	a	double	*- Numerical values.* *- No characters allowed* *- No spaces between numbers*
	b	double	*- Numerical values.* *- No characters allowed* *- No spaces between numbers*
Resultado o Postcondición	Performs the corresponding operation of the function, displaying the approximate result of the root of the function.		
Salidas	**Nombre salida**	**Tipo de dato**	**Formato**
	c	double	Numeric (decimal)

Identificador y nombre	*[RF3-* Absolute Value Method*]*		
Resumen	*The system must allow the user, through a method, to perform an operation called absolute value. The method will receive from the user a value x that would be the number to be evaluated, which would obtain the approximate result of the exact value, according to the value of x that is assigned to it.*		
Entradas	**Nombre entrada**	**Tipo de dato**	**Condición valores válidos**
	x	double	*- Numeric values (decimal)* *- No characters allowed* *- No spaces between numbers* *- The call to the function must not be empty*
Resultado o Postcondición	The result of the absolute value of the number or the expression used by the user will be returned.		
Salidas	**Nombre salida**	**Tipo de dato**	**Formato**
	x	double	Numeric (decimal)
	-x	double	Numeric (decimal)

Identificador y nombre	*[RF4-Pow Method]*		
Resumen	*The system must allow the user, through a method, to perform an operation called potentiation. The method will receive from the user a value x that would be the number to evaluate, which would evaluate the number based on the assigned power. And would return the approximate result of the value, based on the value of x that is assigned to it.*		
Entradas	**Nombre entrada**	**Tipo de dato**	**Condición valores válidos**
	x	double	*- Numeric (decimal) values* *- No characters allowed* *- No spaces between numbers* *- The call to the function must not be empty*
Resultado o Postcondición	The result of the absolute value of the number or the expression used by the user will be returned.		
Salidas	**Nombre salida**	**Tipo de dato**	**Formato**
	resultabs	double	Numeric (decimal)

Identificador y nombre	*[RF5-Factorial Method]*		
Resumen	*The system should allow the user to perform an operation called factorial through a method. The method will receive a value x from the user, which would be the number to evaluate, and would obtain the approximate result of the factorial based on the assigned value of x.*		
Entradas	**Nombre entrada**	**Tipo de dato**	**Condición valores válidos**
	x	double	*- Numeric (decimal) values* *- No characters allowed* *- No spaces between numbers* *- The call to the function must not be empty*
Resultado o Postcondición	The result of the factorial operation on the user-assigned value will be returned.		
Salidas	**Nombre salida**	**Tipo de dato**	**Formato**
	resultfactory	double	Numeric (decimal)

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APO 1