

Scientific Calculator

Mikha Wy (2020390018)

Edrick Hansel Limantoro (2020930004)

Roger Cashley (2020390020)

COMP2424-A Data Structures & Algorithms

Mr. Muhamad Rausyan Fikri

Date of Submission: 14 October 2021

GitHub Repository Link: https://github.com/MikhaWy/Scientific_Calculator

Project Goals

Please create a scientific calculator using C++, with the rules below:

1. The calculator should have + - / : (10 points)
2. Basic trigonometry function: sin cos tan (10 points)
3. More than basic function: square root, exp, log, ln (15 points)
4. The calculator can input up to 10 or more variables and parameters. It is not limited to 2 + 2, 3 x 3, etc. (15 points)
5. Inside the code, you apply the class function (separate class, inline class, constructor, etc.) (20 points)
6. Inside the code, you apply the linked list or queue function (20 points)
7. It can delete and show the history of the calculator (10 points)

The teamwork section is based on GitHub, which the score will be:

1. Using GitHub, you understand how to use the fork option, pull request option.
2. Teamwork on solving the problem. In your report, you must state the person in charge.
Please make sure each member has an equivalent contribution.

Clone Line

```
> git clone https://github.com/MikhaWy/Scientific\_Calculator.git
```

Compile Line

```
> cd src> g++ -o main main.cpp calculator.cpp linkedlist.cpp program.cpp
> .\main
```

Sample Output

```
C:\WINDOWS\System32\cmd.exe - .\main
C:\Users\user\Documents\SU_Midterm-DSnA\Scientific_Calculator>cd src
C:\Users\user\Documents\SU_Midterm-DSnA\Scientific_Calculator\src>g++ -o main main.cpp program.cpp linkedlist.cpp calculator.cpp
C:\Users\user\Documents\SU_Midterm-DSnA\Scientific_Calculator\src>.\main
List of Commands:
[1] Calculate
[2] Degree Mode
[3] View History
[4] Delete History
[5] Reset Calculator
[6] Exit Program
Enter a Command:
_
```

Figure 1 Sample Output 1

Sample Input

1. Calculation Command

```
C:\WINDOWS\System32\cmd.exe - .\main
C:\Users\user\Documents\SU_Midterm-DSnA\Scientific_Calculator\src>g++ -o main main.cpp program.cpp linkedlist.cpp calculator.cpp
C:\Users\user\Documents\SU_Midterm-DSnA\Scientific_Calculator\src>.\main
List of Commands:
[1] Calculate
[2] Degree Mode
[3] View History
[4] Delete History
[5] Reset Calculator
[6] Exit Program
Enter a Command:
1
-----
Enter an expression ('end' to terminate, 'ANS()' to use previous answer):
2 + 2
= 4.000000
-----
(8 + sqrt(3) / 4)
= 8.433013
-----
sin(30) + cos(30) + tan(30)
= 1.943376
-----
ANS() * 2
= 3.886751
-----
end
-----
Enter a Command:
```

Figure 2 Sample Input Calculation 1

```

-----
end
-----
Enter a Command:
1
-----
Enter an expression ('end' to terminate, 'ANS()' to use previous answer):
log(10) + ln(2)
= 1.693147
-----
exp(3)
= 20.085537
-----
4^3
= 64.000000
-----
end
-----
Enter a Command:

```


Figure 3 Sample Input Calculation 2

2. Complex Expression

Enter an expression ('end' to terminate, 'ANS()' to use previous answer):

$$1 + 2 * 3 / \log(4) + 5^2 * \sin(60) - \tan(15) + \exp(2) - 10 / 4^0 + 1$$

= 30.737526


 $1 + ((2 * 3) / \log(4)) + ((5^2) * \sin(60 \text{ degrees})) - \tan(15 \text{ degrees}) + \exp(2) - (10 / (4^0)) + 1 =$

30.7375262858

Rad		Deg	x!	()	%	AC
Inv	sin	ln	7	8	9	÷	
π	cos	log	4	5	6	×	
e	tan	√	1	2	3	-	
Ans	EXP	x'	0	.	=	+	

Figure 4 Sample Input Complex Expression 1

3. History Command

```
-----
Enter a Command:
3
-----
Calculator history:
> 2 + 2 = 4.000000
> (8 + sqrt(3) / 4) = 8.433013
> sin(30) + cos(30) + tan(30) = 1.943376
> ANS() * 2 = 3.886751
> log(10) + ln(2) = 1.693147
> exp(3) = 20.085537
> 4^3 = 64.000000
-----
Enter a Command:
4
-----
History deleted.
-----
Enter a Command:
3
-----
Calculator history:
No history found.
-----
Enter a Command:
```

Figure 5 Sample Input History Command