LTTS
GLOBAL
ENGINEERING
ACADEMY

L&T Technology Services

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AIM

To build a program that calculates series or parallel resistance according to user input

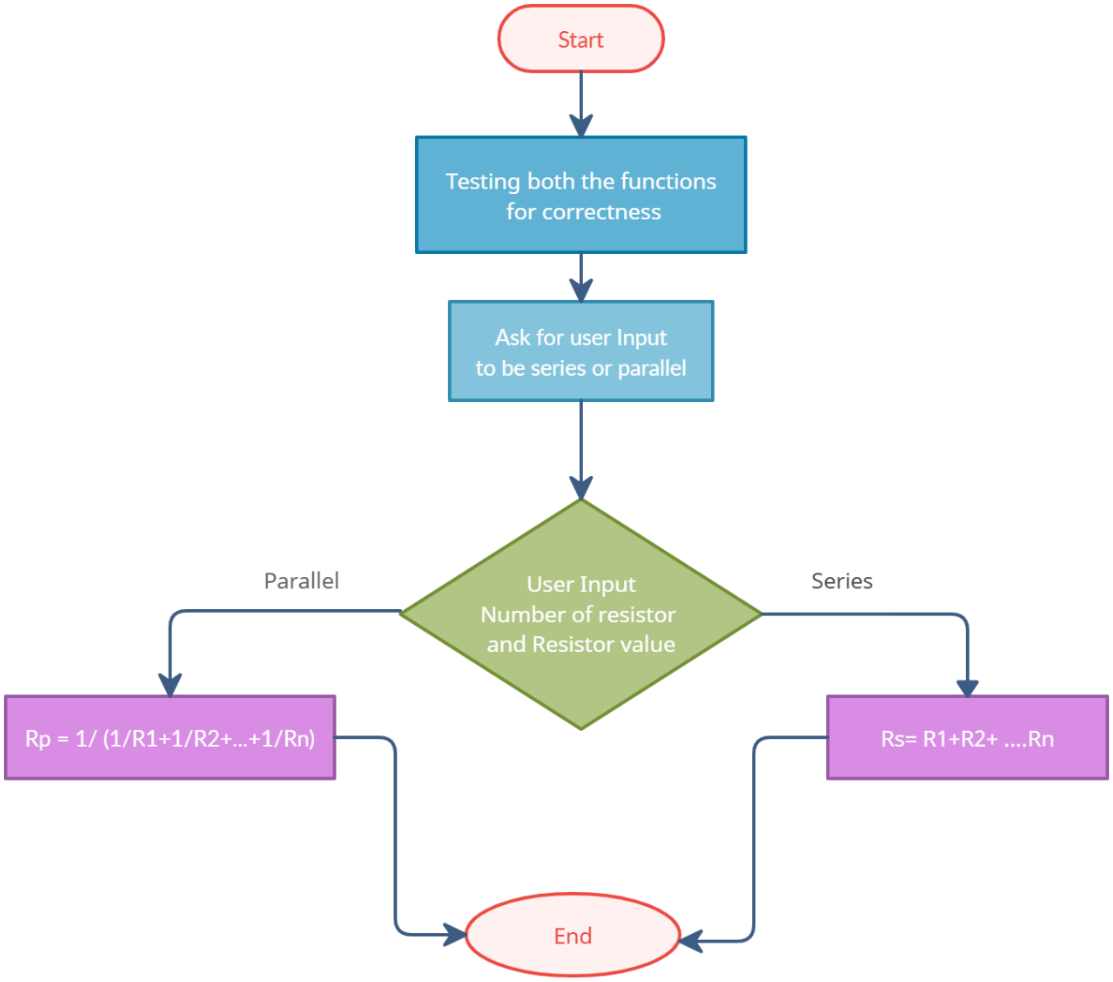
MOTIVE:

- This program is built for electronics engineers mainly to calculate the resistance inside the circuit.
- As we all know the circuits are built across two configurations - Series and Parallel.
- This program enables us to calculate the resistance value for both configurations according to user input.
- This program can calculate any number of resistors.

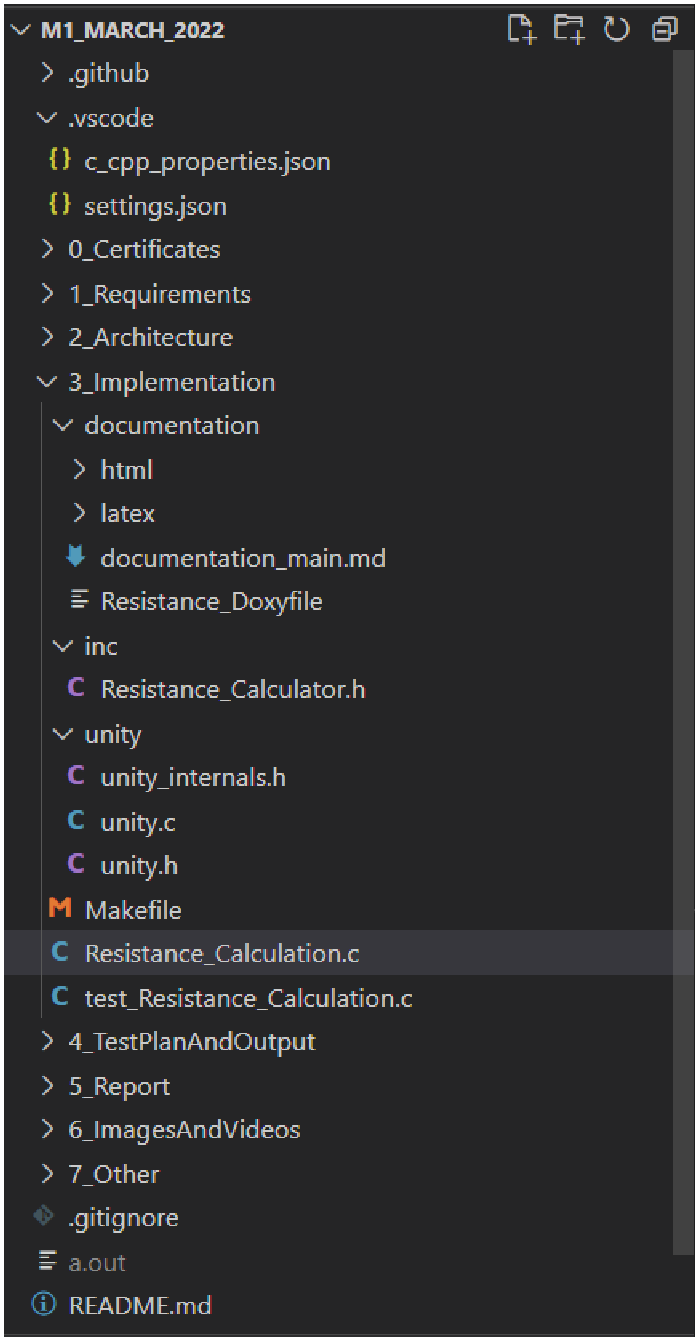
FUNCTIONS DEPLOYED:

- **// Function to calculate the series resistance based on the formula Rs= R1+R2+...+Rn**
  float series_resistance(int res1[],int num1)
- **// Function to calculate parallel resistance based on the formula Rp=(1)/((1/R1)+(1/R2)+(1/R3)+...+(1/Rn)**
  static float parallel_resistance(int res2[],int num2)
- **//Test function for series resistance**
  void test_series_resistance()
- **// Test function for parallel resistance**
  void test_parallel_resistance()
- **int main()**

FLOWCHART:


Start
Testing both the functions for correctness
Ask for user Input to be series or parallel
User Input Number of resistor and Resistor value
Parallel
Series
Rp = 1/ (1/R1+1/R2+...+1/Rn)
Rs= R1+R2+ ....Rn
End

REPOSITORY OUTLINE:



```
M1_MARCH_2022
  .github
  .vscode
    c_cpp_properties.json
    settings.json
  0_Certificates
  1_Requirements
  2_Architecture
  3_Implementation
    documentation
      html
      latex
      documentation_main.md
      Resistance_Doxyfile
    inc
      Resistance_Calculator.h
    unity
      unity_internals.h
      unity.c
      unity.h
    Makefile
    Resistance_Calculation.c
    test_Resistance_Calculation.c
  4_TestPlanAndOutput
  5_Report
  6_ImagesAndVideos
  7_Other
  .gitignore
  a.out
  README.md
```

.C FILES:

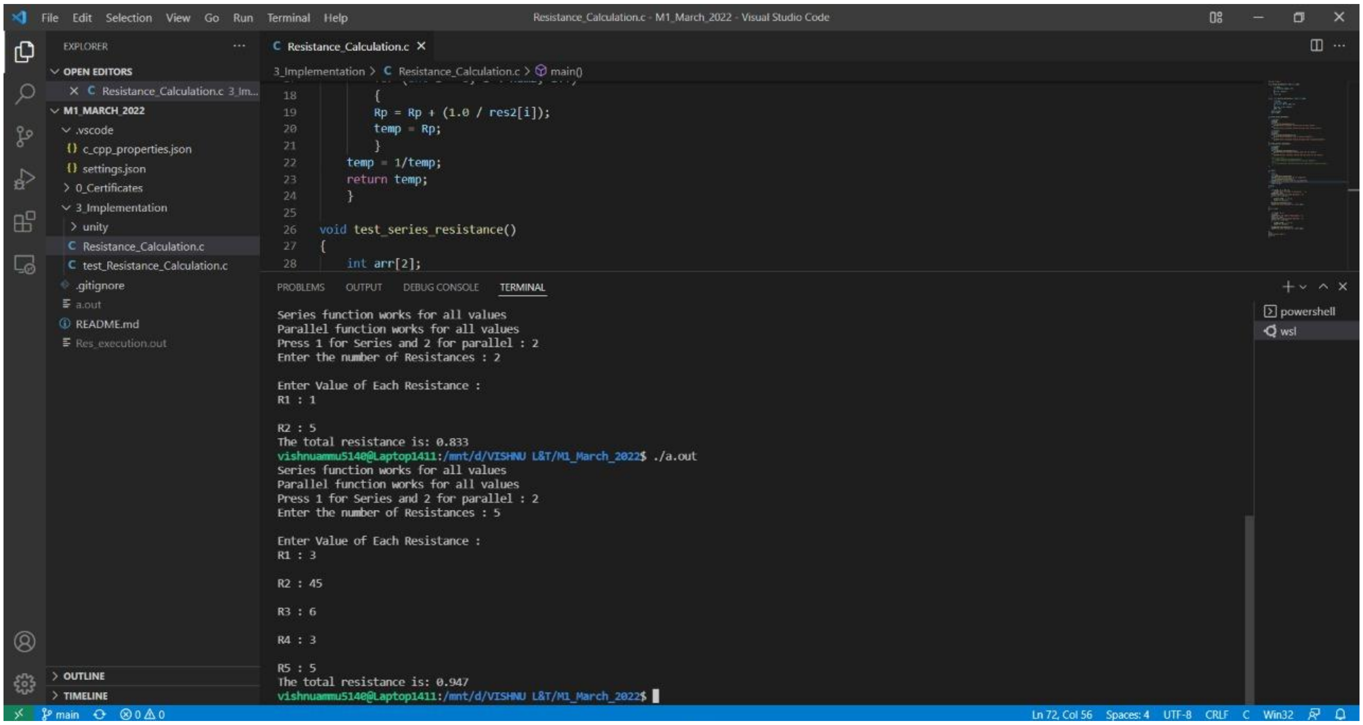
- Resistance_Calculation.c
- test_Resistance_Calculation.c
- unity.c

OTHER FILES:

- Documentation – Doxygen (Resistance_Doxyfile)
- Resistance_Calculator.h
- Makefile

INPUT/ OUTPUT:

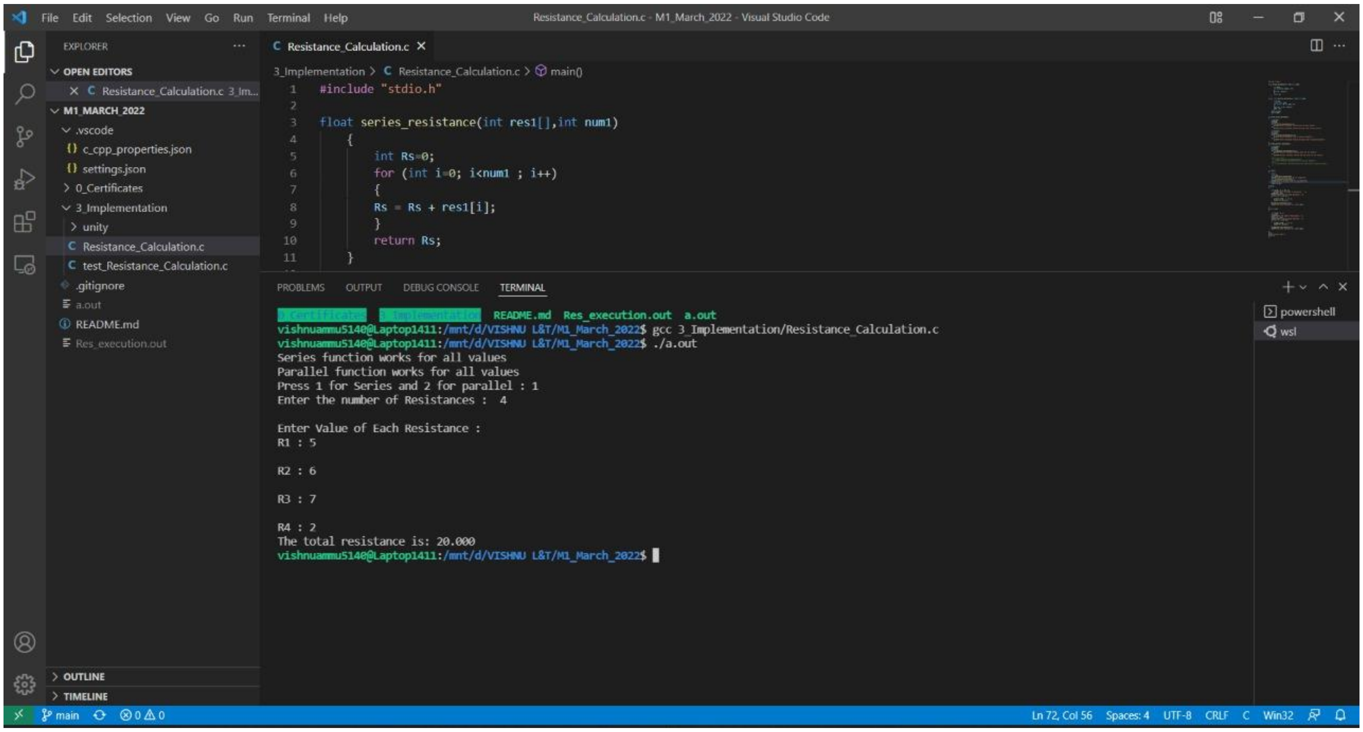
PARALLEL COMBINATION EXECUTION:



```c
        {
        Rp = Rp + (1.0 / res2[i]);
        temp = Rp;
        }
    temp = 1/temp;
    return temp;
    }

void test_series_resistance()
{
    int arr[2];
```

```
Series function works for all values
Parallel function works for all values
Press 1 for Series and 2 for parallel : 2
Enter the number of Resistances : 2

Enter Value of Each Resistance :
R1 : 1

R2 : 5
The total resistance is: 0.833
vishnuammu5140@Laptop1411:/mnt/d/VISHNU L&T/M1_March_2022$ ./a.out
Series function works for all values
Parallel function works for all values
Press 1 for Series and 2 for parallel : 2
Enter the number of Resistances : 5

Enter Value of Each Resistance :
R1 : 3

R2 : 45

R3 : 6

R4 : 3

R5 : 5
The total resistance is: 0.947
vishnuammu5140@Laptop1411:/mnt/d/VISHNU L&T/M1_March_2022$ 
```

SERIES COMBINATION EXECUTION :



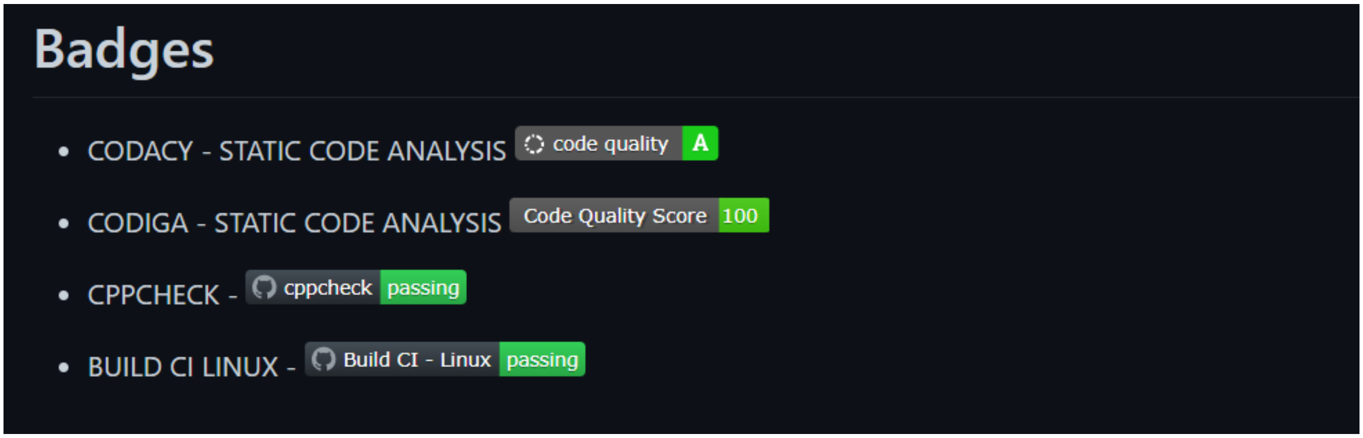
File Edit Selection View Go Run Terminal Help
Resistance_Calculation.c - M1_March_2022 - Visual Studio Code
EXPLORER
OPEN EDITORS
Resistance_Calculation.c 3_Im...
M1_MARCH_2022
.vscode
c_cpp_properties.json
settings.json
0_Certificates
3_Implementation
unity
Resistance_Calculation.c
test_Resistance_Calculation.c
.gitignore
a.out
README.md
Res_execution.out
OUTLINE
TIMELINE
3_Implementation > Resistance_Calculation.c > main()
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
powershell
wsl
main
Ln 72, Col 56 Spaces: 4 UTF-8 CRLF C Win32

```c
#include "stdio.h"

float series_resistance(int res1[],int num1)
    {
        int Rs=0;
        for (int i=0; i<num1 ; i++)
        {
        Rs = Rs + res1[i];
        }
        return Rs;
    }
```

```
0_Certificates  3_Implementation  README.md  Res_execution.out  a.out
vishnuammu5140@Laptop1411:/mnt/d/VISHNU L&T/M1_March_2022$ gcc 3_Implementation/Resistance_Calculation.c
vishnuammu5140@Laptop1411:/mnt/d/VISHNU L&T/M1_March_2022$ ./a.out
Series function works for all values
Parallel function works for all values
Press 1 for Series and 2 for parallel : 1
Enter the number of Resistances :  4

Enter Value of Each Resistance :
R1 : 5

R2 : 6

R3 : 7

R4 : 2
The total resistance is: 20.000
vishnuammu5140@Laptop1411:/mnt/d/VISHNU L&T/M1_March_2022$
```

CI IMPLEMENTED – **YES**

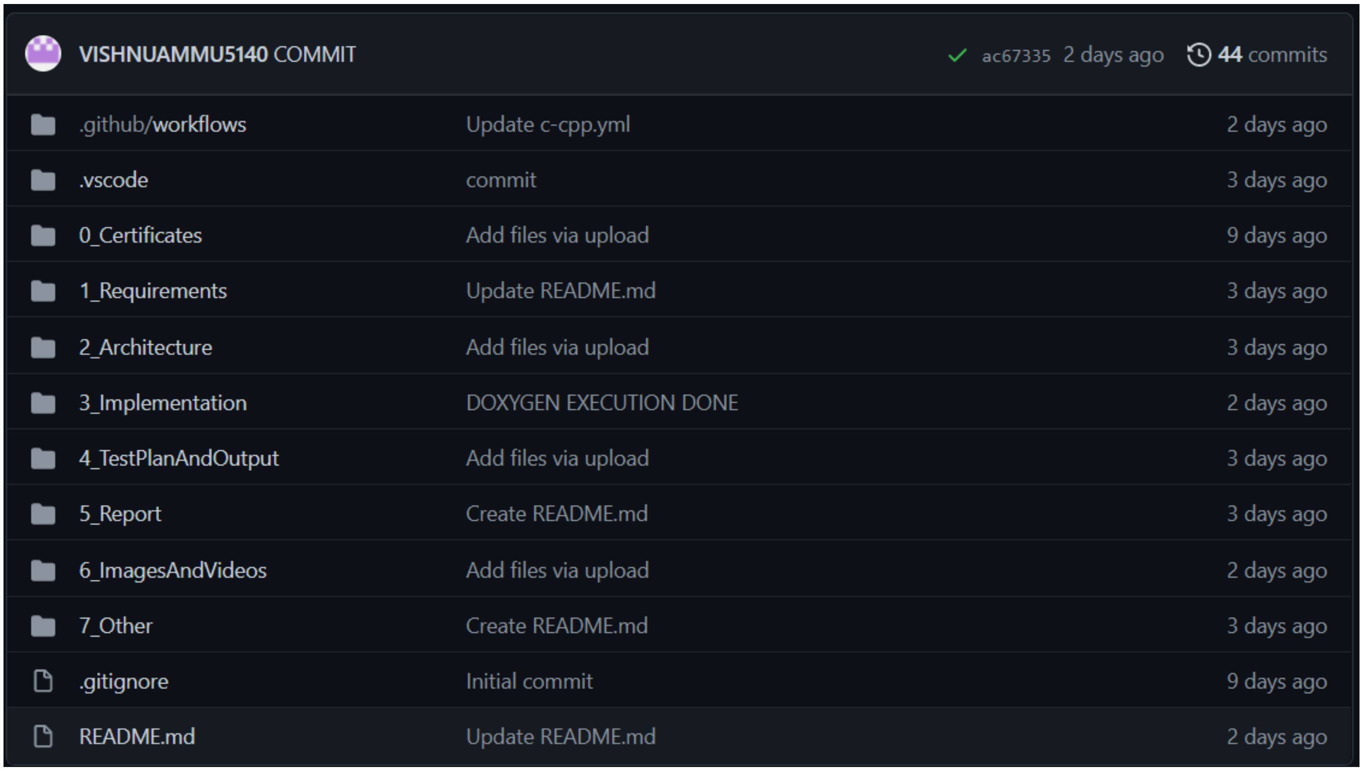
BADGES ACQUIRED:



Badges

- CODACY - STATIC CODE ANALYSIS code quality A
- CODIGA - STATIC CODE ANALYSIS Code Quality Score 100
- CPPCHECK - cppcheck passing
- BUILD CI LINUX - Build CI - Linux passing

GITHUB FOLDER STRUCTURE:



VISHNUAMMU5140 COMMIT ✓ ac67335 2 days ago 44 commits

.github/workflows	Update c-cpp.yml	2 days ago
.vscode	commit	3 days ago
0_Certificates	Add files via upload	9 days ago
1_Requirements	Update README.md	3 days ago
2_Architecture	Add files via upload	3 days ago
3_Implementation	DOXYGEN EXECUTION DONE	2 days ago
4_TestPlanAndOutput	Add files via upload	3 days ago
5_Report	Create README.md	3 days ago
6_ImagesAndVideos	Add files via upload	2 days ago
7_Other	Create README.md	3 days ago
.gitignore	Initial commit	9 days ago
README.md	Update README.md	2 days ago

RESULT AND FUTURE SCOPE:

Thus , the program is executed successfully with basic requirements. Further scope in future will be added to make use of the program with many formulae related to electronics for easy purpose.

REPOSITORY LINK :

https://github.com/VISHNUAMMU5140/M1_March_2022.git