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## README

To use this program, editor must edit the code with your own folder path. On line 403 in the EugeneOoi\_Coursework2.c file, replace the syntax

“C:\\Users\\eugen\\OneDrive\\Desktop\\EugeneOoi\_Coursework2”  
with your own folder path that stores all the .cir files you created so the program can find that folder and search for your own .cir files.

```
397 void loadCircuit(){
398     char fileName[1000];
399     printf("Loading a Circuit.....\n");
400
401     //Path for the folder that stores all the .cir files
402     //Editor need to put their folder path for folder that stores all the .cir files
403     char folderPath[MAX_PATH] = "C:\\Users\\eugen\\OneDrive\\Desktop\\EugeneOoi_Coursework2";
404     listSavedCircuits(folderPath); // List all .cir files in the folder
405
406     printf("Please type your circuit file name to open the circuit file: ");
407     scanf("%s", fileName);
408     readAndSaveToNewFile(fileName, "tempCircuit.cir");
409 }
```

This program supports circuit with 0 resistor and resistor with 0 resistance, the program will treat both as short circuit (resistance = 0).

The program uses a temporary file “tempCircuit.cir” to manage circuit data during execution:

1. **Creating a Circuit**

All circuit data entered by user is stored in “tempCircuit.cir”. At the same time, previous data in “tempCircuit.cir” will be cleared.

2. **Loading a Circuit**

Data from the user-specified file is loaded into “tempCircuit.cir.”, thus the “tempCircuit.cir” now only has all the same data as the user-specified file. At the same time, previous data in “tempCircuit.cir” will be cleared.

3. **Saving a Circuit**

The latest data in “tempCircuit.cir” is saved to a user-specified file.

4. **Analysing a Circuit**

The program analyses the latest circuit data stored in “tempCircuit.cir” and generates report.

## Important Notes

- If the user wants to analyse a previously saved circuit, they must **load** the circuit first, so its data is copied into tempCircuit.cir.
- If no circuit is loaded, the program analyses the current data in tempCircuit.cir, which may not be the latest or relevant.

# OUTPUT

## 1. Option 1: Creating series/parallel circuit

### a. Series circuit

```
C:\Users\eugen\OneDrive\De: X + v

Welcome to the CAD software for Electrical Circuit
1. Create a Circuit
2. Load a Circuit
3. Save current Circuit
4. Analyze and print a Report
5. Exit the Program

Please select your option (1-5)
Option: 1

Creating a Circuit.....
Would you like a series or a parallel circuit ?
[SERIES/PARALLEL] ? : SERIES

Enter the value of the Voltage Source: 50
Enter the number of Resistor: 4
Enter value for Resistor 1: 80
Enter value for Resistor 2: 73
Enter value for Resistor 3: 56.98670
Enter value for Resistor 4: 34.89

Voltage Source Value : 50.00 Volts
Equivalent Resistance: 244.88 Ohms
Current : 0.20 Amps

Welcome to the CAD software for Electrical Circuit
1. Create a Circuit
```

### b. Parallel circuit

```
Welcome to the CAD software for Electrical Circuit
1. Create a Circuit
2. Load a Circuit
3. Save current Circuit
4. Analyze and print a Report
5. Exit the Program

Please select your option (1-5)
Option: 1

Creating a Circuit.....
Would you like a series or a parallel circuit ?
[SERIES/PARALLEL] ? : PARALLEL

Enter the value of the Voltage Source: 490.4353
Enter the number of Resistor: 6
Enter value for Resistor 1: 30
Enter value for Resistor 2: 56.67
Enter value for Resistor 3: 43
Enter value for Resistor 4: 53
Enter value for Resistor 5: 12
Enter value for Resistor 6: 78.99

Voltage Source Value : 490.44 Volts
Equivalent Resistance: 5.29 Ohms
Equivalent Current : 92.74 Amps
```

### c. Invalid Input

```
C:\Users\eugen\OneDrive\De: X + v

|-----|
| Welcome to the CAD software for Electrical Circuit |
| 1. Create a Circuit |
| 2. Load a Circuit |
| 3. Save current Circuit |
| 4. Analyze and print a Report |
| 5. Exit the Program |
|-----|

Please select your option (1-5)
Option: 1

Creating a Circuit.....
Would you like a series or a parallel circuit ?
[SERIES/PARALLEL] ? : ^&*(HJDD
Invalid input, please enter "SERIES" or "PARALLEL": 239HIDJS())&^d
Invalid input, please enter "SERIES" or "PARALLEL": ijd
Invalid input, please enter "SERIES" or "PARALLEL": SERIES

Enter the value of the Voltage Source: DNIDDDJ*&^%$
Invalid input, please put a valid value

Enter the value of the Voltage Source: DNID^&*3
Invalid input, please put a valid value

Enter the value of the Voltage Source: 50
Enter the number of Resistor: DWM%&*
Invalid input, please put a valid value
Enter the number of Resistor: 4
Enter value for Resistor 1: re
Invalid input, please put a valid value
Enter value for Resistor 1: 50
Enter value for Resistor 2: 34
Enter value for Resistor 3: jndjkd.w3
Invalid input, please put a valid value
Enter value for Resistor 3: 40
Enter value for Resistor 4: 65.43

Voltage Source Value : 50.00 Volts
Equivalent Resistance: 189.43 Ohms
Current : 0.26 Amps
```

## 2. Option 2: Load a saved circuit onto tempCircuit.cir which is the temporary memory file

### a. User input the file that wanted to load

```
|-----|
| Welcome to the CAD software for Electrical Circuit |
| 1. Create a Circuit |
| 2. Load a Circuit |
| 3. Save current Circuit |
| 4. Analyze and print a Report |
| 5. Exit the Program |
|-----|

Please select your option (1-5)
Option: 2
Loading a Circuit.....
Available saved circuits in 'C:\Users\eugen\OneDrive\Desktop\EugeneOoi_Coursework2':
- circuit1.cir
- PARALLELDC50.00R14R25R36.cir
- PARALLELDC50.00START0R14R25R36.cir
- SERIESDC50.00R15R210R315.cir
- tempCircuit.cir
Please type your circuit file name to open the circuit file: PARALLELDC50.00START0R14R25R36.cir

|-----|
| Welcome to the CAD software for Electrical Circuit |
| 1. Create a Circuit |
| 2. Load a Circuit |
| 3. Save current Circuit |
| 4. Analyze and print a Report |
|-----|
```

If no command shows up after typing file name indicates the file successfully loaded

## b. Invalid File Name

```
| 3. Save current Circuit  
| 4. Analyze and print a Report  
| 5. Exit the Program  
|-----|  
Please select your option (1-5)  
Option: 2  
Loading a Circuit.....  
Available saved circuits in 'C:\Users\eugen\OneDrive\Desktop\EugeneOoi_Coursework2':  
- circuit1.cir  
- PARALLELDC50.00R14R25R36.cir  
- PARALLELDC50.00START0R14R25R36.cir  
- SERIESDC50.00R15R210R315.cir  
- tempCircuit.cir  
Please type your circuit file name to open the circuit file: dsandasn%*&*(fsts5  
Error opening input file: Invalid argument  
  
|-----|  
| Welcome to the CAD software for Electrical Circuit  
| 1. Create a Circuit  
| 2. Load a Circuit  
| 3. Save current Circuit  
| 4. Analyze and print a Report  
| 5. Exit the Program  
|-----|  
Please select your option (1-5)  
Option: 2  
Loading a Circuit.....  
Available saved circuits in 'C:\Users\eugen\OneDrive\Desktop\EugeneOoi_Coursework2':  
- circuit1.cir  
- PARALLELDC50.00R14R25R36.cir  
- PARALLELDC50.00START0R14R25R36.cir  
- SERIESDC50.00R15R210R315.cir  
- tempCircuit.cir  
Please type your circuit file name to open the circuit file: sdhshdsa  
Error opening input file: No such file or directory  
  
|-----|  
| Welcome to the CAD software for Electrical Circuit  
| 1. Create a Circuit  
| 2. Load a Circuit
```

Command will show up the type of error in opening the file

## 3. Option 3: Save the current circuit data (tempCircuit.cir) onto another user define file

### a. Default File Name

```
|-----|  
| Welcome to the CAD software for Electrical Circuit  
| 1. Create a Circuit  
| 2. Load a Circuit  
| 3. Save current Circuit  
| 4. Analyze and print a Report  
| 5. Exit the Program  
|-----|  
Please select your option (1-5)  
Option: 3  
Saving Circuit.....  
Type in your circuit name or use a default name  
Name (or type DEFAULT) : DEFAULT  
Saving to file: PARALLELDC50.00R14R25R36.cir
```

## b. User Input File Name

```
-----|
| Welcome to the CAD software for Electrical Circuit
| 1. Create a Circuit
| 2. Load a Circuit
| 3. Save current Circuit
| 4. Analyze and print a Report
| 5. Exit the Program
|-----|

Please select your option (1-5)
Option: 3
Saving Circuit.....
Type in your circuit name or use a default name
Name (or type DEFAULT) : circuit2AC
Saving to file: circuit2AC.cir
```

## 4. Option 4: Analyse and generate a circuit report for tempCircuit.cir

### a. Series Circuit Analysis

```
-----|
| Welcome to the CAD software for Electrical Circuit
| 1. Create a Circuit
| 2. Load a Circuit
| 3. Save current Circuit
| 4. Analyze and print a Report
| 5. Exit the Program
|-----|

Please select your option (1-5)
Option: 4
Analyzing circuit.....
Please specify the type of circuit (series or parallel)
[SERIES/PARALLEL] : SERIES

Series Circuit Analysis:
-----|
| Resistor | Resistance (Ohms) | Voltage Drop (V) | Power (W) |
|-----|
| R1       | 12.00             | 0.58              | 0.03       |
| R2       | 45.89             | 2.20              | 0.11       |
| R3       | 983.30            | 47.22             | 2.27       |
|-----|

Total Voltage: 50.00 V
Total Resistance: 1041.19 Ohms
Total Current: 0.05 A
Total Power Consumption: 2.40 W
```

Circuit is analysed based on the data in the tempCircuit.cir file.

## b. Parallel Circuit Analysis

```
-----|
| Welcome to the CAD software for Electrical Circuit |
| 1. Create a Circuit |
| 2. Load a Circuit |
| 3. Save current Circuit |
| 4. Analyze and print a Report |
| 5. Exit the Program |
|-----|
```

Please select your option (1-5)

Option: 4

Analyzing circuit.....

Please specify the type of circuit (series or parallel)

[SERIES/PARALLEL] : PARALLEL

Parallel Circuit Analysis:

```
-----|
| Resistor | Resistance (Ohms) | Branch Current (A) | Power (W) |
|-----|
| R1        | 34.23              | 1.46                | 73.04      |
| R2        | 234.00             | 0.21                | 10.68      |
| R3        | 23.40              | 2.14                | 106.84     |
|-----|
```

Total Voltage: 50.00 V

Total Resistance: 13.12 Ohms

Total Power Consumption: 190.56 W

## c. Invalid Input

```
-----|
| Welcome to the CAD software for Electrical Circuit |
| 1. Create a Circuit |
| 2. Load a Circuit |
| 3. Save current Circuit |
| 4. Analyze and print a Report |
| 5. Exit the Program |
|-----|
```

Please select your option (1-5)

Option: 4

Analyzing circuit.....

Please specify the type of circuit (series or parallel)

[SERIES/PARALLEL] : JIDH^&\*(

Invalid Input, please enter the type of circuit [SERIES/PARALLEL] : hdud5%&86d7

Invalid Input, please enter the type of circuit [SERIES/PARALLEL] : hd3

Invalid Input, please enter the type of circuit [SERIES/PARALLEL] : 45hf

Invalid Input, please enter the type of circuit [SERIES/PARALLEL] : f

Invalid Input, please enter the type of circuit [SERIES/PARALLEL] : PARALELL

Invalid Input, please enter the type of circuit [SERIES/PARALLEL] : PARALLEL

Parallel Circuit Analysis:

```
-----|
| Resistor | Resistance (Ohms) | Branch Current (A) | Power (W) |
|-----|
| R1        | 34.23              | 1.46                | 73.04      |
| R2        | 234.00             | 0.21                | 10.68      |
| R3        | 23.40              | 2.14                | 106.84     |
|-----|
```

Total Voltage: 50.00 V

Total Resistance: 13.12 Ohms

Total Power Consumption: 190.56 W



## 5. Option 5: Exit the program.

```
|-----|
| Welcome to the CAD software for Electrical Circuit |
| 1. Create a Circuit |
| 2. Load a Circuit |
| 3. Save current Circuit |
| 4. Analyze and print a Report |
| 5. Exit the Program |
|-----|

Please select your option (1-5)
Option: 5
Exiting the program.....
Process returned 0 (0x0)   execution time : 5.737 s
Press any key to continue.
|
```

## 6. Invalid input for menu option

```
|-----|
| 1. Create a Circuit |
| 2. Load a Circuit |
| 3. Save current Circuit |
| 4. Analyze and print a Report |
| 5. Exit the Program |
|-----|

Please select your option (1-5)
Option: djd

Invalid Input, please insert the correct choice

|-----|
| Welcome to the CAD software for Electrical Circuit |
| 1. Create a Circuit |
| 2. Load a Circuit |
| 3. Save current Circuit |
| 4. Analyze and print a Report |
| 5. Exit the Program |
|-----|

Please select your option (1-5)
Option: ()hdh
```

Invalid Input, please insert the correct choice

```
|-----|
| Welcome to the CAD software for Electrical Circuit |
| 1. Create a Circuit |
| 2. Load a Circuit |
| 3. Save current Circuit |
| 4. Analyze and print a Report |
| 5. Exit the Program |
|-----|
```

Please select your option (1-5)

Option: 87GHD\*(

Invalid Input, please insert the correct choice

```
|-----|
| Welcome to the CAD software for Electrical Circuit |
| 1. Create a Circuit |
| 2. Load a Circuit |
| 3. Save current Circuit |
| 4. Analyze and print a Report |
| 5. Exit the Program |
|-----|
```

Please select your option (1-5)

Option: dh(\*&456