Homework 2

Resistor Calculator

C PROGRAMMING CLASS

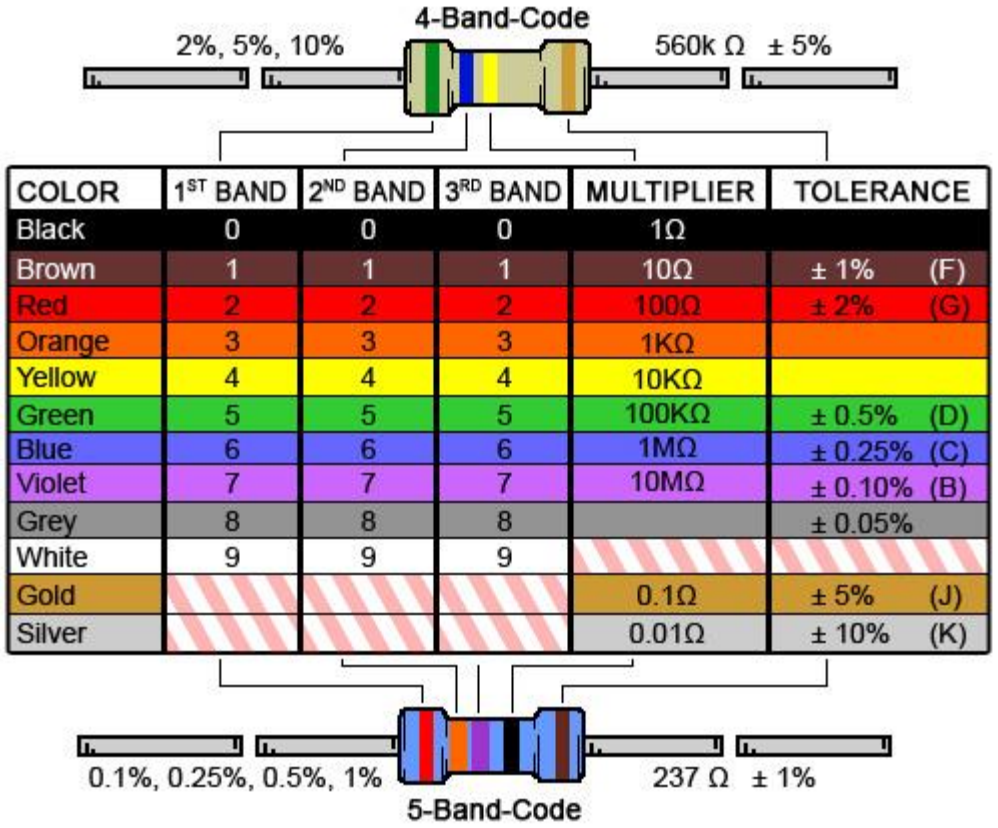
Resistor Calculator Program Introduction

- In this homework you are about to make a program that can calculate the resistance of a resistor based on the 4-band color code on the resistor.

Image Source

How do you calculate the resistance?

- In this homework, we will be using the 4-band color coded resistor.
- The 1st and the 2nd band is the value, the 3rd band is the multiplier and the 4th band is the tolerance.



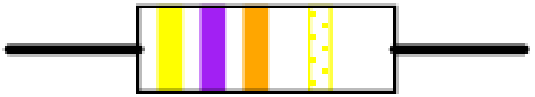
COLOR	1ST BAND	2ND BAND	3RD BAND	MULTIPLIER	TOLERANCE
Black	0	0	0	1Ω	
Brown	1	1	1	10Ω	± 1% (F)
Red	2	2	2	100Ω	± 2% (G)
Orange	3	3	3	1KΩ	
Yellow	4	4	4	10KΩ	
Green	5	5	5	100KΩ	± 0.5% (D)
Blue	6	6	6	1MΩ	± 0.25% (C)
Violet	7	7	7	10MΩ	± 0.10% (B)
Grey	8	8	8		± 0.05%
White	9	9	9		
Gold				0.1Ω	± 5% (J)
Silver				0.01Ω	± 10% (K)

Image Source

How do you calculate the resistance? (cont.)

Example #1

Image Source



A resistor colored *Yellow-Violet-Orange-Gold* would be 47 kΩ with a tolerance of +/- 5%.

Example #2

A resistor colored *Green-Red-Gold-Silver* would be 5.2 Ω with a tolerance of +/- 10%.

Resistor Calculator Program

Type 1, maximum score for this type is 90

```
 Welcome to the
   Resistor Color Code Program

***************INSTRUCTION***************
Color Code:
 Black  [b]  = 0        Green  [g]  = 5
 Brown  [br] = 1        Blue   [bl] = 6
 Red    [r]  = 2        Violet [v]  = 7
 Orange [o]  = 3        Gray   [gr] = 8
 Yellow [y]  = 4        White  [w]  = 9
Tolerance Code:
 Gold   [go] = 5%       Silver [s] = 10%

Input the color code, separated with '-'
*Type in "quit" to exit program
Color Code ->
```

Resistor Calculator Program (cont.)

Type 1, maximum score for this type is 90

```
 Welcome to the
   Resistor Color Code Program

**************INSTRUCTION**************
Color Code:
 Black  [b]  = 0       Green  [g]  = 5
 Brown  [br] = 1       Blue   [bl] = 6
 Red    [r]  = 2       Violet [v]  = 7
 Orange [o]  = 3       Gray   [gr] = 8
 Yellow [y]  = 4       White  [w]  = 9
Tolerance Code:
 Gold   [go] = 5%      Silver [s] = 10%

Input the color code, separated with '-'
*Type in "quit" to exit program
Color Code -> o-b-o-go
The color code translates to 30.0 kOhms with 5% Tolerance

Input the color code, separated with '-'
*Type in "quit" to exit program
Color Code ->
```

Resistor Calculator Program (cont.)

Type 1, maximum score for this type is 90

```
Input the color code, separated with '-'
*Type in "quit" to exit program
Color Code -> y-v-r-s
The color code translates to 4.7 kOhms with 10% Tolerance

Input the color code, separated with '-'
*Type in "quit" to exit program
Color Code -> br-b-o-go
The color code translates to 10.0 kOhms with 5% Tolerance

Input the color code, separated with '-'
*Type in "quit" to exit program
Color Code -> br-b-br-go
The color code translates to 100.0 Ohms with 5% Tolerance
```

Resistor Calculator Program (cont.)

Type 1, maximum score for this type is 90

```
Input the color code, separated with '-'
*Type in "quit" to exit program
Color Code -> r-r-br-s
The color code translates to 220.0 Ohms with 10% Tolerance

Input the color code, separated with '-'
*Type in "quit" to exit program
Color Code -> quit
moi@moi-VirtualBox:~/Desktop/HW2$
```

Resistor Calculator Program

Type 2, maximum score for this type is 100

```
moi@moi-VirtualBox:~/Desktop/HW2$ gcc hw2_100.c -lm
moi@moi-VirtualBox:~/Desktop/HW2$ ./a.out

  Welcome to the
     Resistor Color Code Program

 Menu:
 1. Color Code -> Resistor Value
 2. History
 3. Clear History
 4. Exit
 Input choice:
```

Resistor Calculator Program (cont.)

Type 2, maximum score for this type is 100

```
moi@moi-VirtualBox:~/Desktop/HW2$ ./a.out

  Welcome to the
    Resistor Color Code Program

Menu:
1. Color Code -> Resistor Value
2. History
3. Clear History
4. Exit
Input choice: 1

**************INSTRUCTION**************
Color Code:
 Black  [b]  = 0       Green  [g]  = 5
 Brown  [br] = 1       Blue   [bl] = 6
 Red    [r]  = 2       Violet [v]  = 7
 Orange [o]  = 3       Gray   [gr] = 8
 Yellow [y]  = 4       White  [w]  = 9
Tolerance Code:
 Gold   [go] = 5%      Silver [s] = 10%

Input the color code, separated with '-'
*Type in "return" to back to main menu
Color Code ->
```

```
Input the color code, separated with '-'
*Type in "return" to back to main menu
Color Code -> o-b-o-go
The color code translates to 30.0 kOhms with  5% Tolerance

Input the color code, separated with '-'
*Type in "return" to back to main menu
Color Code -> y-v-r-go
The color code translates to 4.7 kOhms with  5% Tolerance

Input the color code, separated with '-'
*Type in "return" to back to main menu
Color Code -> br-b-br-go
The color code translates to 100.0 Ohms with  5% Tolerance

Input the color code, separated with '-'
*Type in "return" to back to main menu
Color Code -> return

Menu:
1. Color Code -> Resistor Value
2. History
3. Clear History
4. Exit
Input choice:
```

Resistor Calculator Program (cont.)

Type 2, maximum score for this type is 100

```
Input the color code, separated with '-'
*Type in "return" to back to main menu
Color Code -> return

Menu:
1. Color Code -> Resistor Value
2. History
3. Clear History
4. Exit
Input choice: 2

       Color      Resistance        Tolerance
        code         in Ohms           in '%'
   ========================================
    o-b-o-go           30000                 5
    y-v-r-go            4700                 5
  br-b-br-go             100                 5

Menu:
1. Color Code -> Resistor Value
2. History
3. Clear History
4. Exit
Input choice:
```

```
Menu:
1. Color Code -> Resistor Value
2. History
3. Clear History
4. Exit
Input choice: 3
Done deleting history file!

Menu:
1. Color Code -> Resistor Value
2. History
3. Clear History
4. Exit
Input choice: 2

       Color      Resistance        Tolerance
        code         in Ohms           in '%'
   ========================================

Menu:
1. Color Code -> Resistor Value
2. History
3. Clear History
4. Exit
Input choice:
```

Resistor Calculator Program (cont.)

Type 2, maximum score for this type is 100

hw2_100.c × history.txt ×

```
1 o-b-o-go 30000 5
2 y-v-r-go 4700 5
3 br-b-br-go 100 5
```

```
Menu:
1. Color Code -> Resistor Value
2. History
3. Clear History
4. Exit
Input choice: 4
moi@moi-VirtualBox:~/Desktop/HW2$
```

Notice

- The deadline for this homework is 12th of April if you took the Tuesday class, or 14th of April if you took the Thursday class.
- Don't use `goto` statement in your program!
- For this homework, you don't need to worry about error handling if the user input a wrong input!
- You need to upload the finished code to ecourse and you need to demo your program to TA!