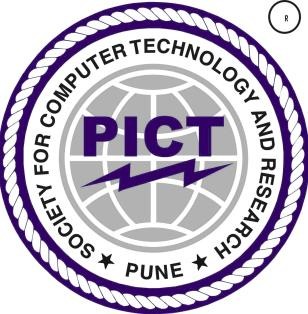
# SCTR’s Pune Institute of Computer Technology, Pune – 43

## Department of Electronics and Telecommunication Engineering



CERTIFICATE

This is to certify that the A Project Report entitled

**Finding the values of resistors ,capacitor and inductor using color code**

has been successfully completed by

1. Unnati Jain
2. Krishna Thakur
3. Ansh Shah
4. Punnet Rathi

Is a bona fide work carried out by them under the supervision of Dr. V. B. Vaijapurkar and it is approved for the partial fulfillment of the requirements for the Data Structures Subject of S.E. E&TC – 2019 Course of the Savitribai Phule Pune University, Pune.

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| Dr. V.B.Vaijapurkar |  | Dr. M. V. Munot |
| Project Guide |  | HOD, E&TC |
| Dept. of E&TC |  |  |

Place: Pune Date:

### Title:

**Finding values of Resistor, Capacitor and Inductor using color coded**

Problem Statement:

Write a C program to perform the operations on a dataset. Find the values of resistors, capacitors and inductors using color code provided by the user

Objectives:

1. To learn how to find the values of various electrical components using color codes
2. To determine the data structure required to calculate the values in c program

Data structures used:

String

Outcomes:

1. The string data structure is used to handle the program for finding out these values
2. Values of different components are calculated by taking inputs from the user about the bands and their colours

Project code:

#include <stdio.h>

#include <math.h>

int getColorValue(int color) {

if (color >= 0 && color <= 9) return color;

else {

printf("Invalid color number. Please try again.\n");

return -1;

}

}

double getMultiplier(int color) {

switch (color) {

case 0: return 1; // Black

case 1: return 10; // Brown

case 2: return 100; // Red

case 3: return 1000; // Orange

case 4: return 10000; // Yellow

case 5: return 100000; // Green

case 6: return 1000000; // Blue

case 7: return 10000000; // Violet

case 8: return 100000000; // Gray

case 9: return 1000000000; // White

case -1: return 0.1; // Gold

case -2: return 0.01; // Silver

default:

printf("Invalid multiplier color. Please try again.\n");

return -1;

}

}

float getTolerance(int color) {

switch (color) {

case 1: return 1.0; // Brown

case 2: return 2.0; // Red

case 5: return 0.5; // Green

case 6: return 0.25; // Blue

case 7: return 0.1; // Violet

case 8: return 0.05; // Gray

case -1: return 5.0; // Gold

case -2: return 10.0; // Silver

default:

printf("Invalid tolerance color. Please try again.\n");

return -1;

}

}

void calculateResistorValue(int bands) {

int color, value = 0;

double multiplier;

float tolerance;

if (bands == 3 || bands == 4) {

printf("Enter the 1st color (0-9): ");

scanf("%d", &color);

value += getColorValue(color) \* 10;

printf("Enter the 2nd color (0-9): ");

scanf("%d", &color);

value += getColorValue(color);

printf("Enter the multiplier color (0-9, -1 for gold, -2 for silver): ");

scanf("%d", &color);

multiplier = getMultiplier(color);

if (bands == 4) {

printf("Enter the tolerance color (1: Brown, 2: Red, 5: Green, -1: Gold, -2: Silver): ");

scanf("%d", &color);

tolerance = getTolerance(color);

printf("The resistor value is: %.2f ohms ± %.2f%%\n", value \* multiplier, tolerance);

} else {

// For 3 bands, no tolerance

printf("The resistor value is: %.2f ohms\n", value \* multiplier);

}

} else {

printf("Currently, only 3 and 4-band resistors are supported.\n");

}

}

void calculateCapacitorValue(int bands) {

int color;

long value = 0;

double multiplier;

if (bands == 3 || bands == 4) {

printf("Enter the 1st color (0-9): ");

scanf("%d", &color);

value += getColorValue(color) \* 10;

printf("Enter the 2nd color (0-9): ");

scanf("%d", &color);

value += getColorValue(color);

printf("Enter the multiplier color (0-9, -1 for gold, -2 for silver): ");

scanf("%d", &color);

multiplier = getMultiplier(color);

value \*= multiplier;

if (bands == 4) {

printf("Enter the tolerance color (1: Brown, 2: Red, -1: Gold, -2: Silver): ");

scanf("%d", &color);

printf("The capacitor value is: %ld pF ± %d%%\n", value, getTolerance(color));

} else {

printf("The capacitor value is: %ld pF\n", value);

}

} else {

printf("Currently, only 3 or 4-band capacitors are supported.\n");

}

}

void calculateInductorValue(int bands) {

int color;

long value = 0;

double multiplier;

if (bands == 3 || bands == 4) {

printf("Enter the 1st color (0-9): ");

scanf("%d", &color);

value += getColorValue(color) \* 10;

printf("Enter the 2nd color (0-9): ");

scanf("%d", &color);

value += getColorValue(color);

printf("Enter the multiplier color (0-9, -1 for gold, -2 for silver): ");

scanf("%d", &color);

multiplier = getMultiplier(color);

value \*= multiplier;

if (bands == 4) {

printf("Enter the tolerance color (1: Brown, 2: Red, -1: Gold, -2: Silver): ");

scanf("%d", &color);

printf("The inductor value is: %ld μH ± %d%%\n", value, getTolerance(color));

} else {

printf("The inductor value is: %ld μH\n", value);

}

} else {

printf("Currently, only 3 or 4-band inductors are supported.\n");

}

}

int main() {

int choice, bands;

printf("Choose the component to calculate the value:\n");

printf("1. Resistor\n");

printf("2. Capacitor\n");

printf("3. Inductor\n");

printf("Enter your choice (1/2/3): ");

scanf("%d", &choice);

printf("Enter the number of bands: ");

scanf("%d", &bands);

switch (choice) {

case 1:

calculateResistorValue(bands);

break;

case 2:

calculateCapacitorValue(bands);

break;

case 3:

calculateInductorValue(bands);

break;

default:

printf("Invalid choice. Please enter 1, 2, or 3.\n");

break;

}

return 0;

}

# PROJECT OUTPUT

# Choose the component to calculate the value:

# 1. Resistor

# 2. Capacitor

# 3. Inductor

# Enter your choice (1/2/3): 1

# Enter the number of bands: 3

# Enter the 1st color (0-9): 3

# Enter the 2nd color (0-9): 4

# Enter the multiplier color (0-9, -1 for gold, -2 for silver): 5

# The resistor value is: 3400000.00 ohms

# Choose the component to calculate the value:

# 1. Resistor

# 2. Capacitor

# 3. Inductor

# Enter your choice (1/2/3): 2

# Enter the number of bands: 3

# Enter the 1st color (0-9): 1

# Enter the 2nd color (0-9): 4

# Enter the multiplier color (0-9, -1 for gold, -2 for silver): 6

# The capacitor value is: 14000000 pF

# Choose the component to calculate the value:

# 1. Resistor

# 2. Capacitor

# 3. Inductor

# Enter your choice (1/2/3): 3

# Enter the number of bands: 3

# Enter the 1st color (0-9): 1

# Enter the 2nd color (0-9): 3

# Enter the multiplier color (0-9, -1 for gold, -2 for silver): 5

# The inductor value is: 1300000 μH

Conclusions:

We have successfully implemented and calculated the values of resistors , capacitors and inductors based on the color code

References:

Seymour Lipschutz – Data Structures in C, Schawm’s Outlines, Tata McGrawHill(Third Edition) E – Balguruswamy, Programming in ANSI - C

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| **Continuous Assessment for DS AY: 2024-25** | | | |
| **RPP (5)** | **SPO (5)** | **Total (10)** | **Signature:** |
|  |  |  | **Assessed By: Dr. V. B. Vaijapurkar** |
| **Start date** | **Submission date** | | **Date:** |
|  |  | |  |
| **\*Regularity, Punctuality, performance**  **\*Submission, Presentation, orals** | | | |