Lab Exercise 3: Selection Statements (if/else if and switch)

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ELEC2850 Microcontrollers Using C Programming

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1 Problem Statement

Given a table of boiling points of several substances, create a program that gets the user's boiling point of their fluid (in °Celcius) and tells the user what substace their fluid is as long as the substance is within 5% of the given boiling point. When the substance is unkown, let the user know that.

Table 1: Expected boiling points of substances.

Substance	Normal boiling point (°C)
Water	100
Mercury	357
Copper	1187
Silver	2193
Gold	2660

2 Algorithm

3 Output

Figure 1: Coffee.

4 Code

```c
#include <stdio.h>

int main()
{
    float temperature;                                                          // initialize variable temperature for user to input their fluids temperature
    printf("Enter the boiling point of your fluid: ");                          // prompt user to input the boiling point of their fluid
    scanf("%f", &temperature);                                                  // store the boiling point of the fluid in the variable temperature
    if (temperature <= ((100 * 0.05) + 100) && temperature >= (100 - (100 * 0.05))) // if the temperature is within 5% of the boiling point of water
    {
        printf("The fluid is water.\n"); // print to the user that the fluid is water
    }
    else if (temperature <= ((357 * 0.05) + 357) && temperature >= (357 - (357 * 0.05))) // if the temperature is within 5% of the boiling point of mercury
    {
        printf("The fluid is mercury.\n"); // print to the user that the fluid is mercury
    }
    else if (temperature <= ((1187 * 0.05) + 1187) && temperature >= (1187 - (1187 * 0.05))) // if the temperature is within 5% of the boiling point of copper
    {
        printf("The fluid is copper.\n"); // print to the user that the fluid is copper
    }
    else if (temperature <= ((2193 * 0.05) + 2193) && temperature >= (2193 - (2193 * 0.05))) // if the temperature is within 5% of the boiling point of silver
    {
        printf("The fluid is silver.\n"); // print to the user that the fluid is silver
    }
    else if (temperature <= ((2660 * 0.05) + 2660) && temperature >= (2660 - (2660 * 0.05))) // if the temperature is within 5% of the boiling point of gold
```

```
    {
        printf("The fluid is gold.\n"); // print to the user that the fluid is gold
    }
    else
    {
        printf("The fluid is unknown.\n"); // if the temperature is not within 5% of any of the boiling points, print to the user that the fluid is unknown
    }
    return 0; // quits program nicely
}
```