LBYEC2A

Computer Fundamentals and Programming 1

Laboratory Activity 5

C - Conditional Statements

By

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OBJECTIVES

- Learn the conditional statements of C-language using ladderized if-else and case/switch statements.
- Develop algorithms and flowcharts for use in programming applications.
- Design, compile, test, run, and implement the C language program
- Design, compile, test, run, and implement the C language program
- Creating a flowchart based on the programs needed
- Maximize and explore the features of Visual Studio Code

MATERIALS

1. Visual Studio Code
    a. C Compiler (mingw64)
    b. Draw.io (Flowchart Extension)
2. Module Guide: DLSU Canva
3. Snipping Tool

PROCEDURE

1. **Lab Activity 5.1 Earthquake:** Create a program that determines the earthquake's damage.
    a. Open Visual Studio Code
    b. Create a new file and name it 'earthquake.c' or whatever filename the user prefers as long as it ends with '.c' to ensure you have a c program file.
    c. Since the program won't require the function of math we will Input the default format of the c program. **#include <stdio.h>**
    d. **DECLARE FUNCTIONS and VARIABLE -** *int main(void) is the main function that will be called without any parameter. Void functions are used just like value-returning functions except the void does not return a value when the function is executed.* Inside the main function, we declare the variable level that will be an indication as the user's input and the program itself will have a set condition to follow.

```c
int main(void){
    // 1. Variable declaration
    float level;
```

e. **INPUT AND PRINT -** After declaring the variable we now need to print out the instructions and will require the user to input a specific earthquake level to be compared and evaluated by the program.

```c
// 2. User-input prompt and scan
printf("\nEnter earthquake level: \n");
scanf("%f", &level);
```

f. CONDITIONAL STATEMENTS - Our goal in this program is to determine the Earthquake's damage according to the user's input which is the level of the earthquake. We use if statements to evaluate within a certain condition. After setting the condition, we print what outcome or damage it has according to the user's input.

```c
if (level < 5.0) printf("Little or no damage \n");
else if (level == 5.0, level <5.5) printf("Some damage \n");
else if (level == 5.5, level <6.5) printf("Serious damage \n")
else if (level == 6.5, level <7.0) printf("Disaster \n");
else printf("Catastrophe \n");
```

2. **Lab Activity 5.2 Conversion:** Create a program that Converts a specific value to another. In this program, we require the user to choose an option of what kind of conversion would they prefer.
    a. Open Visual Studio Code
    b. Create a new file and name it 'conversion.c' or whatever filename the user prefers as long as it ends with '.c' to ensure you have a c program file.
    c. Since the program won't require the function of math we will Input the default format of the c program. **#include <stdio.h>**
    d. **DECLARE FUNCTIONS and VARIABLE -** Inside the main function, we declare the function of choice and set it as an integer because we will use it to create a switch case statement, followed by the variable convert, and result that will be declared as a float.

```c
int main(void){
    // 1. Declare variables
    int choice;
    float convert, result;
```

e. **INPUT AND PRINT -** After declaring the variable we now need to print out the instructions and will require the user to input a specific mode to be converted

```c
printf("========================\n"
"     MENU Options\n"
"========================\n"
"(1) Conversions from miles to km\n"
"(2) Conversions from pounds to kg\n"
"(3) Conversions from deg. F to deg. R\n");
// 3. Prompt the user and scan value
printf("\nEnter choice: \n");
scanf("%d", &choice);
```

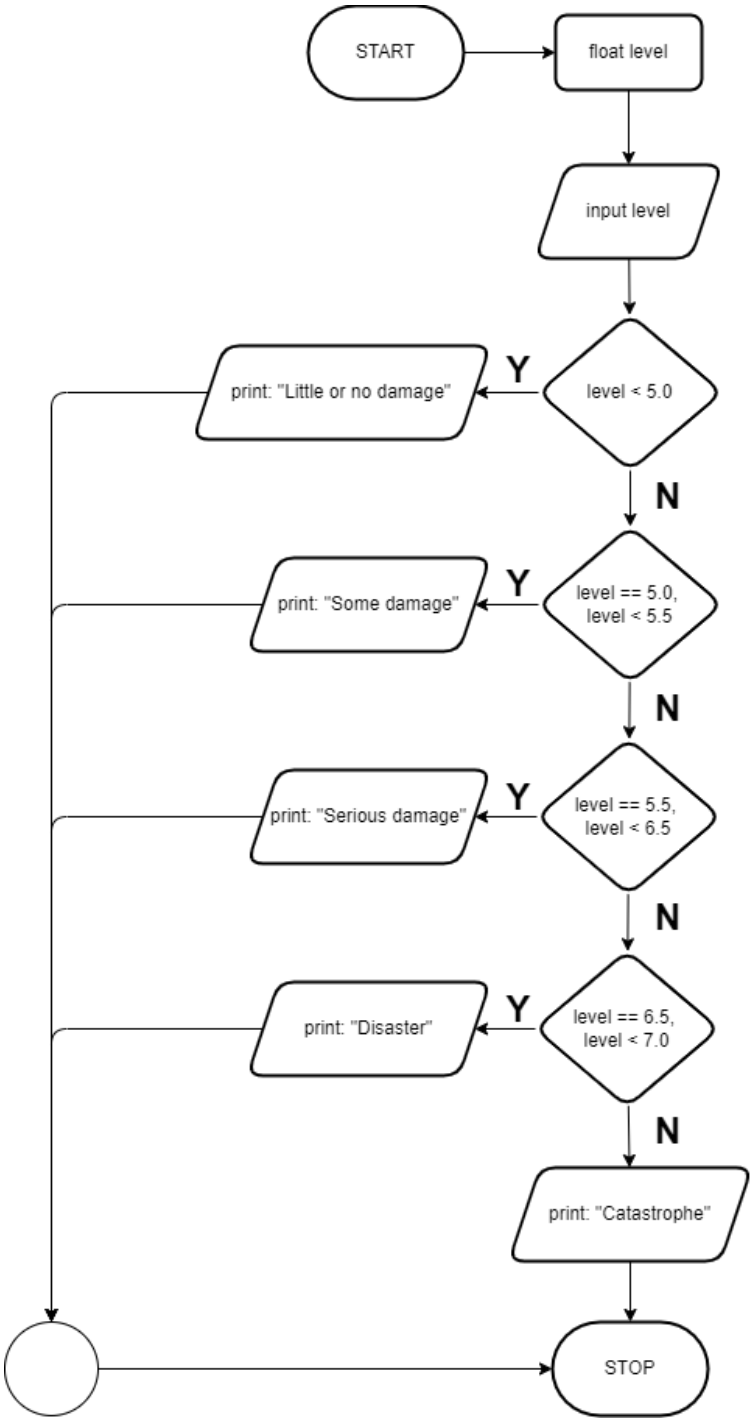
f. **CONDITIONAL STATEMENTS (CASE) -** We used the switch case statements to easily determine which option or which conversion rate would the user prefer. After choosing an option or mode, the program will require the user to input the value that they wanted to convert into.

```c
// 4. Decision
switch (choice){
    case 1:
        printf("You chose conversions from miles to km");
        printf("Input value of miles: ");
        scanf("%f", &convert);

        result = convert * 1.6093440;
        printf("Miles to KM == %.2f", result);
        break;
    case 2:
        printf("You chose conversions from pounds to kg");
        printf("Input value of pounds: ");
        scanf("%f", &convert);

        result = convert / 2.205;
        printf("LB to KG == %.2f", result);
        break;
    case 3:
        printf("You chose conversions from deg. F to deg. R");
        printf("Input value of def. F: ");
        scanf("%f", &convert);

        result = convert + 459.67;
        printf("LB to KG == %.2f", result);
        break;
    default:
        printf("This is an invalid option!");
```

ALGORITHM FLOWCHARTS (*Include the code flowcharts here)*

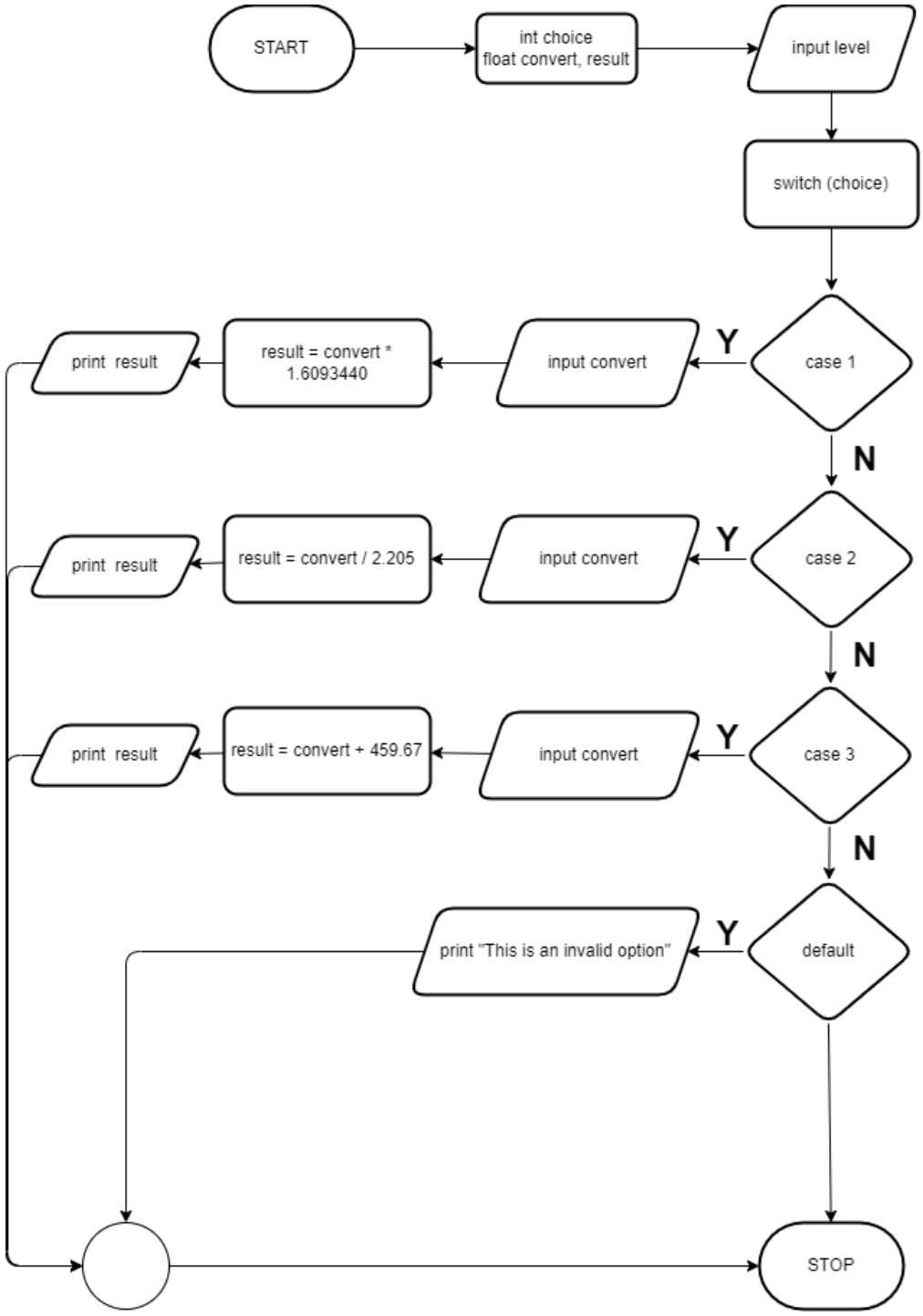
1. **Lab Activity 5.1 Earthquake:**

Flowcharts:



2. **Lab Activity 5.2 Conversion:**

Flowcharts:



RESULTS AND DISCUSSION (*Include the screenshots and discussions per problem solution*)

1. **Lab Activity 5.1 Earthquake:**

```
Enter earthquake level:
6.6
Disaster
```

```c
int main(void){
    // 1. Variable declaration
    float level;
    // 2. User-input prompt and scan
    printf("\nEnter earthquake level: \n");
    scanf("%f", &level);
    // 3. Decision
    if (level < 5.0) printf("Little or no damage \n");
    else if (level == 5.0, level <5.5) printf("Some damage \n");
    else if (level == 5.5, level <6.5) printf("Serious damage \n");
    else if (level == 6.5, level <7.0) printf("Disaster \n");
    else printf("Catastrophe \n");
    // Exit
    return 0;
}
```

In this program, we'll see the base function of the conditional statements, how they operate and how it verifies the input according to the condition. In this example, the program will check which characteristics of the earthquake belong. If the level is less than 5.0 then the program will print out what type of damage the earthquake dealt in this case it will display "Little or no damage". It evaluates if the condition is true or false and it prints/displays the characteristic of the earthquake.

2. **Lab Activity 5.2 Conversion:**

```c
#include <stdio.h>
// mi to km == 1 mi= 1.6093440 km
// kg to lb == 1kg = 2.205 lb divide**
// tf to tr == Recall Tf = Tr - 459.67 deg R
```

```c
int main(void){
    // 1. Declare variables
    int choice;
    float convert, result;
    // Your code here! (More declarations)
    // 2. Display the menu
    printf("======================\n"
    "     MENU Options\n"
    "======================\n"
    "(1) Conversions from miles to km\n"
    "(2) Conversions from pounds to kg\n"
    "(3) Conversions from deg. F to deg. R\n");
    // 3. Prompt the user and scan value
    printf("\nEnter choice: \n");
    scanf("%d", &choice);

    // 4. Decision
    switch (choice){
        case 1:
            printf("You chose conversions from miles to km");
            printf("Input value of miles: ");
            scanf("%f", &convert);

            result = convert * 1.6093440;
            printf("Miles to KM == %.2f", result);
            break;
        case 2:
            printf("You chose conversions from pounds to kg");
            printf("Input value of pounds: ");
            scanf("%f", &convert);

            result = convert / 2.205;
            printf("LB to KG == %.2f", result);
            break;
        case 3:
            printf("You chose conversions from deg. F to deg. R");
            printf("Input value of def. F: ");
            scanf("%f", &convert);

            result = convert + 459.67;
            printf("LB to KG == %.2f", result);
            break;
        default:
            printf("This is an invalid option!");
    }
    // Exit
    return 0;
}
```

In this program, the function of the case switch will be used for this problem. In which the user will first pick their preferred conversion options in the menu. Miles to Kilometers, or Pounds to Kilograms, or Degree Fahrenheit to Degree Rankine. I used google as a basis for how they were calculated. Each case has a specific instruction and process of equating a specific conversion option, after the process, the program will display the result.

SUMMARY and WHAT I LEARNED (*Sample: around 5 or more sentences; include*)

In Module 5 / Lab Activity 5, we were introduced and focused on conditional statements and switch-case statements. We utilized these statements in our Lab Activity 5, in the first activity with the Earthquake.c we used the Conditional statements; while in the second activity with Conversion.c we used the switch case statements. One challenge

which I encountered would be the logical errors in the problem. I misread and miscalculated the formulas in the second problem, by these mistakes I can be more aware and more vigilant about my work, I should double-check it before I submit my work, and this can be a learning experience for me and all programmers out there.

REFERENCES

1. Cabatuan, M. (n.d.) LBYEC2A Conditional Statement. Retrieved from. https://dlsu.instructure.com/courses/91770/assignments/799132?module_item_id=2195640

APPENDIX (*For coding problems, copy all codes here*)(C codes)

1. EARTHQUAKE.C

```
#include <stdio.h>


int main(void){
    // 1. Variable declaration
    float level;
    // 2. User-input prompt and scan
    printf("\nEnter earthquake level: \n");
    scanf("%f", &level);
```

```
    // 3. Decision
    if (level < 5.0) printf("Little or no damage \n");
    else if (level == 5.0, level <5.5) printf("Some damage \n");
    else if (level == 5.5, level <6.5) printf("Serious damage \n");
    else if (level == 6.5, level <7.0) printf("Disaster \n");
    else printf("Catastrophe \n");
    // Exit
    return 0;
}
```

2. CONVERSION.C

```
#include <stdio.h>
// mi to km == 1 mi= 1.6093440 km
// kg to lb == 1kg = 2.205 lb divide**
// tf to tr == Recall Tf = Tr - 459.67 deg R

int main(void){
    // 1. Declare variables
    int choice;
    float convert, result;
    // Your code here! (More declarations)
```

```
// 2. Display the menu
printf("========================\n"
"     MENU Options\n"
"========================\n"
"(1) Conversions from miles to km\n"
"(2) Conversions from pounds to kg\n"
"(3) Conversions from deg. F to deg. R\n");
// 3. Prompt the user and scan value
printf("\nEnter choice: \n");
scanf("%d", &choice);

// 4. Decision
switch (choice){
    case 1:
        printf("You chose conversions from miles to km");
        printf("Input value of miles: ");
        scanf("%f", &convert);

        result = convert * 1.6093440;
        printf("Miles to KM == %.2f", result);
        break;
    case 2:
        printf("You chose conversions from pounds to kg");
        printf("Input value of pounds: ");
```

```
            scanf("%f", &convert);


            result = convert / 2.205;
            printf("LB to KG == %.2f", result);
            break;
        case 3:
            printf("You chose conversions from deg. F to deg. R");
            printf("Input value of def. F: ");
            scanf("%f", &convert);


            result = convert + 459.67;
            printf("LB to KG == %.2f", result);
            break;
        default:
            printf("This is an invalid option!");
    }
    // Exit
    return 0;
}
```