

CSCI 121 Project 04

The temperature of earth at a depth

Introduction

The project is designed to ensure that the students know how to write and call functions.

Before start: Review chapter 4. Make sure that you understand the following things:

- How to declare a function.
- How to write a function.
- How to call a function, including call `function A` from `function B` which is not main function.

Problem description

Write a program to take a depth in **kilometers** inside the earth as input data; calculate and display the temperature at this depth in both degrees **Celsius** and degree **Fahrenheit**. The formulas are:

Celsius temperature at depth in km: $celsius = 10 \times depth(km) + 20$

Convert celsius to fahrenheit: $fahrenheit = 1.8 \times celsius + 32$

You should have 4 functions in your program.

1. `void print_introduction (){}
// prints out information to tell the user what this program does.`
2. `double celsius_at_depth (double depth){}
// computes and returns the celsius temperature at a depth measured in kilometers.`
3. `double celsius_to_fahrenheit (double celsius){}
// converts a Celsius temperature celsius to Fahrenheit.`
4. `void print_conclusion(double depth){}
// display the conclusion that what is the temperature in both Celsius and Fahrenheit at depth of the earth`

Additional requirement

There is **no calculation** in main function. The pseudo code steps for main function as follows:

1. print introduction by calling `print_introduction` function
2. ask user to enter the `depth`
3. get user's input
4. print out the conclusion by calling `print_conclusion` function

5. ask user if he/she wants to continue
6. get user's input
7. repeat step 2 to step 6 if user picks 'Y' or 'y'
8. Stop program

All the necessary calculations are done in `print_conclusion` function. `celsius_at_depth` and `celsius_to_fahrenheit` functions are called from `print_conclusion` function.

There is **no calculation** in main function. No calling `celsius_at_depth` or `celsius_to_fahrenheit` functions in main function.

Sample Run

Hello! The program will tell you the temperature of the earth at any depth.

Enter a depth in KM: `10`

The temperature of the earth at a depth of 10 KM is 120 in Celsius, and 248 in Fahrenheit.

Would you like to do it again? (Y/N): `y`

Enter a depth in KM: `20`

The temperature of the earth at a depth of 20 KM is 220 in Celsius, and 428 in Fahrenheit.

Would you like to do it again? (Y/N): `n`

Program ended with exit code: 0