Mahidol University

ITCS 201 – Fundamentals of Programming
Week 14: Lab Assignments

Name: _____ ID: _____

Due: today or in a lab session next week

Instructions:

- Marking lab assignments will be done in the lab
- **Compile** and **Run** your program
- **Show** and **Explain** the output and your code to the lecturer or the lab assistance.

---------- Lab Assignments ----------

Question 1: Create a program using a structure that stores student information as follows:

Student

- id (an integer number)
- name (a string of at least 80 characters)
- birthdate (a structure consists of:)
  - day (an integer number)
  - month (an integer number)
  - year (an integer number. For example, 1993)

You must create two structure: `Student` and `Birthdate`. The `Student` structure contains the `Birthdate` structure to store the student's birthdate information.

The program must read the input data from the provided input file called `student.txt`. Download the file from MyCourses and place it in the same directory as your program. You can adapt from the code below to read the file and populate the structure.

```
int id, day, month, year;
char name[80];
FILE *inFile;
inFile = fopen("student.txt", "r");
if (inFile == NULL) {
    printf("Failed to open the file.\n");
    exit(1);
}
while (fscanf(inFile, "%d %s %d %d %d", &id, name, &day, &month, &year) != EOF)
{
    printf("Read %d %s %d %d %d\n", id, name, day, month, year);
    /* copy the data into the Student struct */
}
```

Create a function called `calculateAge` that receives a `Student` structure and returns the age (2018 - the year the student was born) as an integer value.

Lastly, the program must write the student information and his/her age into a new file called `student_age.txt`.

Expected Output

```
Read: 31257 Alice 14 12 1993
Saved to: student_age.txt
```

The `student_age.txt` file must contain the info below:

```
Student ID: 31257
Name: Alice
Birthdate: 14/12/1993
Age: 25
```

Bonus Question: Your friend wants to create a C program to convert temperature from Fahrenheit to Celsius by reading a set of Fahrenheit values from a file named `f.txt` (`f.txt` can be found on MyCourses). He also wants to write the result to a file. He knows that you are very good at C programming so he asks you to help.

Using the knowledge of file I/O, help your friend create a C program that read Fahrenheit values from the file and write the Celsius output to another file named `c.txt` resides in the same directory.

Expected Output

```
Converting from F to C ...
0.00
7.39
13.78
26.22
65.72
93.72
```

The `c.txt` file must contain the info below:

```
0.00
7.39
13.78
26.22
65.72
93.72
```