Offline Assignment 1

Total Marks: **25**

Problem Description

In this assignment, we will find the day of the week from a date and will also prepare a calendar on a monthly basis.

Science: Day of the Week

July 20, 1973 is a FRIDAY. There is a formula to find the day of the week for a particular date. Zeller's congruence is an algorithm developed by Christian Zeller to calculate the day of the week. The formula is as follows:

$$h = \left(q + \left\lfloor \frac{26(m+1)}{10} \right\rfloor + y + \left\lfloor \frac{y}{4} \right\rfloor + 6 * \left\lfloor \frac{y}{100} \right\rfloor + \left\lfloor \frac{y}{400} \right\rfloor \right) \% 7$$

Where,

- h is the *day of the week*
  (**0**: *Saturday*, **1**: *Sunday*, **2**: *Monday*, **3**: *Tuesday*, **4**: *Wednesday*, **5**: *Thursday*, **6**: *Friday*)

- q is the *day of the month*

- m is the *month of the year*
  (**3**: *March*, **4**: *April*, ….., **12**: *December*)
  ** *January* and *February* are counted as months **13** and **14** of the *previous year respectively*

- y is the *year*

***N.B.*:**

- In this algorithm, *January* and *February* are counted as months **13** and **14** of the *previous year respectively*, e.g. if it is **February 2, 2010**, the algorithm counts the date as the 2nd (**second**) day of the 14th (**fourteenth**) month of **2009** (**02/14/2009** in DD/MM/YYYY format). **Consequently, for *January* and *February*, the year y should be replaced by $y - 1$. Suffice to say, the month m should also be replaced by $m + 12$ then.**

Task #1 (Determining the Day of the Week)

Write down a function that takes year y, month of the year m and day of the month q as parameters and returns the day of the week h. Using this function, write down a C program that prompts the user to enter a year, a month of that year, and a day of that month as inputs, and then displays the corresponding *name* of the day of the week.   [10]

Sample Input/Output

Here is an output of a sample run:

Input:

> Enter year: 2005
>
> Enter month (1-12): 1
>
> Enter day: 21

Output:

> JANUARY 21, 2005 is FRIDAY

Task #2 (Displaying Calendars)

Write down a function that takes year y and month of the year m as parameters and displays the calendar table for the month m in the year y on the console. Using this function, write down a C program that prompts the user to enter a year, and a month of that year as inputs, and then displays the corresponding *calendar* for the month, year combination.   [15]

For example, if the user enters the year *2005*, and the month *2*, your program should display the calendar for *February, 2005*.

Sample Input/Output

Here is an output of a sample run:

Input:

> Enter year: 2005
>
> Enter month (1-12): 2

Output:

Calendar for:

FEBRUARY, 2005

SUN	MON	TUE	WED	THU	FRI	SAT
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28					

N.B.:

➢ You *can not* use any **library function(s)** for any of the aforementioned tasks (other than **I/O**).

➢ You *can not* use any **array** or **pointer** while solving any of the aforementioned tasks.

➢ You *can* assume that the provided input(s) will always be valid.

➢ You *do not need* to display any **colorful output(s)**. Those were included in the document to improve readability.

Assignment Rules

★ Assignment must be submitted in **Moodle**. Submissions via email **will not** be accepted.

★ *Follow* the instructions regarding **submissions** mentioned below:

> **First, rename the task file(s) containing your source code(s) as your *StudentId_TaskNo.c* (For example, if your student ID is *2005001*, the name of the file for *Task #1* should be *2005001_1.c*). After that, put your source code file(s) in a folder named as your *StudentId* i.e. *2005001*. Then, <u>zip</u> it. Finally, submit the zip file (*2005001.zip*) to Moodle. Any other file type will *not* be accepted. Make sure that your submitted file contains your source code(s).**
> ***Failure to follow these instructions will result in penalties.**

★ **Deadline** for the assignment is *25/02/2022* at *11:55 PM*.

★ Avoid *plagiarism* with utmost priority, i.e., write all programs on your own. **DO NOT COPY** codes, programs or ideas from others and do not share your programs, ideas or codes with others. We regularly use copy checkers, so your submitted assignment will be checked for plagiarism against *your classmates* as well as against the *internet*.

★ If any *plagiarism* gets detected:

  ➢ First time copier and copyee will receive **negative marking** (**-100%**) because of dishonesty. Their default is greater than those who will not submit. So, be **CAUTIOUS**.

  ➢ Repeated occurrences will lead to **severe** departmental action and that could jeopardize your academic career (you may be **EXPELLED** for up to two years as per the policy of **BUET**). We expect fairness and honesty from you. *Do not* disappoint us!

★ **No** request for extending the assignment deadline will be entertained.

Acknowledgements

★ *Dr. A.K.M. Ashikur Rahman*

  ● Professor, CSE, BUET