**INTERNATIONAL ISLAMIC UNIVERSITY ISLAMABAD**

**FOC – Software Engineering Department**



**Software Construction & Development SE-302**

**Assignment - *02***

**Name: Rayyan Ghulam Haider**

**Registration #: 4106-FBAS/BSSE/F20**

**Date: 20/03/2023**

* User shall input the year with 4 digits 1900
* The system shall output the given year is a Leap Year or Not.
* **Your Code Shall Print the 400 Year Calendar as well.**
* **See the attachment Leap Year February Date Shall be Highlighted.**
* Firstly, Follow Code Optimization as Discussed in the Class.
* Secondly, Reduce the Code Complexity by the two methods discussed in detail in a class.

CODE:

#include <iostream>

#include <vector>

#include <iomanip>

bool is\_leap\_year(int year) {

return (year % 4 == 0 && year % 100 != 0) || (year % 400 == 0);

}

void print\_calendar(int month, int year) {

std::vector<int> days\_in\_month = {31, 28 + is\_leap\_year(year), 31, 30, 31, 30, 31, 31, 30, 31, 30, 31};

std::cout << "Month: " << month << ", Year: " << year << std::endl;

std::cout << "Sun Mon Tue Wed Thu Fri Sat" << std::endl;

int year\_code = ((year - 1) / 100 \* 5) % 7;

int century\_code = (year - 1) % 100 / 4;

int month\_code = (month + 1) \* 26 / 10;

int day\_of\_week = (year\_code + century\_code + month\_code + 1) % 7;

int day = 1;

for (int i = 0; i < day\_of\_week; i++) {

std::cout << " "

}

while (day <= days\_in\_month[month - 1]) {

std::cout << std::setw(3) << day;

if ((day\_of\_week + day) % 7 == 0) {

std::cout << std::endl;

}

day++;

}

std::cout << std::endl;

}

int main() {

int start\_year = 1600;

int end\_year = start\_year + 399;

int year;

std::cout << "Enter a year with 4 digits (between " << start\_year << " and " << end\_year << "): ";

std::cin >> year;

if (year < start\_year || year > end\_year) {

std::cerr << "Error: Invalid year entered." << std::endl;

return 1;

}

for (int month = 1; month <= 3; month++) {

print\_calendar(month, year);

}

return 0;

}

OUTPUT:

Enter a year with 4 digits (between 1600 and 1999): 1999

Month: 1, Year: 1999

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 29

30 31

Month: 2, Year: 1999

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

Month: 3, Year: 1999

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 29 30 31