Module 3:

Flow of Control

COP2274

In-class Assignments

UF UNIVERSITY of FLORIDA

M3A Leap year checker

Write a program that checks if a year is a leap year or not. Your program must prompt an user input, display the result, ask the user if they want to enter another year (y/n), repeat the program until the user enters 'n', and then exit with “Goodbye!” as shown in the test cases.

Notes:

- *A leap year has 366 days (the extra day is the 29th of February). A leap year is a year which is divisible by 4, or a century year, when it's divisible by 400.*
- *Assume that the user always enters a valid input.*

M3A Leap year checker

Test cases

```
Enter a year: 2021
Year 2021 is not a leap year.
Do you want to enter another year? (y/n) y

Enter a year: 2020
Year 2020 is a leap year.
Do you want to enter another year? (y/n) y

Enter a year: 1900
Year 1900 is not a leap year.
Do you want to enter another year? (y/n) y

Enter a year: 2000
Year 2000 is a leap year.
Do you want to enter another year? (y/n) n

Goodbye!
```

M3B Calendar printer

Write a program using if-else statements, switch statements, and/or loops (for, while, do-while)that prints a month's calendar after prompting the user inputs as shown in the test cases. Your program must validate all the user inputs (or keep prompting the user inputs until the user enters valid inputs), display the formatted calendar, ask the user if they want to print another calendar (y/n), repeat the program until the user enters 'n', and then exit with "Goodbye!" as shown in the test cases.

Notes:

- *Assume that the user always enters an integer for the initial user inputs.*
- *You can use setw function in the library iomanip.*

M3B Calendar printer

Test cases

```
Enter a month (1 to 12): 13
Enter a month (1 to 12): 1
Enter days in the month (28, 29, 30, or 31): 25
Enter days in the month (28, 29, 30, or 31): 31
Enter start day (0 to 6): 7
Enter start day (0 to 6): 5
JANUARY
--- --- --- --- --- --- ---
Sun Mon Tue Wed Thr 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
Do you want to print another month? (y/n) y
```

```
Enter a month (1 to 12): 4
Enter days in the month (28, 29, 30, or 31): 30
Enter start day (0 to 6): 4
APRIL
--- --- --- --- --- --- ---
Sun Mon Tue Wed Thr 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
Do you want to print another month? (y/n) n

Goodbye!
```

M3C 2D image display with options

Write a program to print any of the four patterns in the table on the right. The pattern type (1 to 4) and the size (1 to 9) are given by the user. The table shows the size equals to 5. Your program must prompt user inputs, validate all the user inputs (or keep prompting the user inputs until the user enters valid inputs), ask the user if they want to print another pattern (y/n), repeat the program until the user enters 'n', and then exit with "Goodbye!" as shown in the test cases.

Type 1	Type 2	Type 3	Type 4
#	#####	#####	#
##	####	####	##
###	###	###	###
####	##	##	####
#####	#	#	#####

Note:

- *Assume that the user always enters an integer for the initial user inputs.*

M3C 2D image display with options

Test cases

```
Enter the type of the pattern (1-4): 5
Enter the type of the pattern (1-4): 1
Enter the size of the pattern (1-9): 11
Enter the size of the pattern (1-9): 7
#
##
###
####
#####
######
#######

Do you want to print another pattern? (y/n) y
```

```
Enter the type of the pattern (1-4): 3
Enter the size of the pattern (1-9): 5
#####
 ####
  ###
   ##
    #

Do you want to print another pattern? (y/n) n

Goodbye!
```