CS161FZ Introduction to Computer Science

Lab Assignment 9

There are *two* tasks to be completed.

General Information:
- Use variables instead of literals in your programs.

Task 1: Bar Rotator

Write a complete computer program that rotates the bar (denoted using "0"s) in the matrix. The program should
1. ask a user for an input of a rotation degree (0, 45, 90, 135, 180, 225, 270, 315, 360),
2. rotate the bar clockwise,
3. print the rotated bar in the matrix to the screen, use an empty space to separate elements.
4. wait for the user to input "exit" (ignore case) to terminate the program.
5. test your program using the following inputs:
   45
   315
   Exit

The initial matrix is given below:
{1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1},
{1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1},
{1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1},
{1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1},
{1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1},
{0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0},
{0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0},
{1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1},
{1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1},
{1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1},
{1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1},
{1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1}

Example Input:
90
45
Example Output:
```
 1 1 1 1 1 0 0 1 1 1 1 1
 1 1 1 1 1 0 0 1 1 1 1 1
 1 1 1 1 1 0 0 1 1 1 1 1
 1 1 1 1 1 0 0 1 1 1 1 1
 1 1 1 1 1 0 0 1 1 1 1 1
 1 1 1 1 1 0 0 1 1 1 1 1
 1 1 1 1 1 0 0 1 1 1 1 1
 1 1 1 1 1 0 0 1 1 1 1 1
 1 1 1 1 1 0 0 1 1 1 1 1
 1 1 1 1 1 0 0 1 1 1 1 1
 1 1 1 1 1 0 0 1 1 1 1 1
 1 1 1 1 1 0 0 1 1 1 1 1

 1 0 1 1 1 1 1 1 1 1 1 1
 0 1 0 1 1 1 1 1 1 1 1 1
 1 0 1 0 1 1 1 1 1 1 1 1
 1 1 0 1 0 1 1 1 1 1 1 1
 1 1 1 0 1 0 1 1 1 1 1 1
 1 1 1 1 0 1 0 1 1 1 1 1
 1 1 1 1 1 0 1 0 1 1 1 1
 1 1 1 1 1 1 0 1 0 1 1 1
 1 1 1 1 1 1 1 0 1 0 1 1
 1 1 1 1 1 1 1 1 0 1 0 1
 1 1 1 1 1 1 1 1 1 0 1 0
 1 1 1 1 1 1 1 1 1 1 0 1
```

Task 2: Record Sanity Checker

At the end of each semester, students' scores are required to input into the college record system for archiving. In some colleges, these scores are manually inputted into the computer system. Before the students' scores are archived for long term storage, the system often perform some sanity check. In the appended file (StudentScore.txt), it contains 210 student records. Each record contains a student number and a score. A student number must starts with "T00", followed by 6 digits; a score must be in the range [0, 100], inclusively.

Write a complete computer program to check each student record, whether the student's score is in the valid range and/or whether the student number is in the correct format, then print the line(s) containing illegal record(s) to the screen.

Sample Records: (the first 5 records)

Student Name	Score
T00699518	74
T00255775	47
T00359012	60
T00392279	98
T00886455	91