Autumn 2023, ISTM, FCU-Purdue 2+2 ECE Program
ISTM116 Programming Applications for Engineers, Quiz 1

Use file name "quiz1_Dxxxxxxx_1.c" for Question 1 and file name "quiz1_Dxxxxxxx_2.c" for Question 2 for your source, where "Dxxxxxxx" is your student ID. When you finish a question, upload the source code file to the instructor's computer.

1. (50 points) You may start with program skeleton **quiz1_skeleton_1.c** and change the file name to **quiz1_Dxxxxxxx_1.c**. Write a C program that reads (i) a positive integer, top, from 3 to 29 as the length of the top of a parallelogram, (ii) a positive integer, side, from 2 to 20 as the length of the side *between the top and the bottom* of a **parallelogram**, and (iii) an integer, tilt, 0 for left-tilt or 1 for right-tilt of the side of the parallelogram. In your program, (a) draw the parallelogram as the above description, using '#' to mark the surrounding sides of the parallelogram and '@' to mark the interior points of the parallelogram, and (b) compute and print the number of characters on the perimeter, the number of characters in the interior, and the total number of characters of the parallelogram. Output 10 leading blanks on the left-hand-side of the figure. You **must** use function printChar() to print the figure. Program execution examples:

```
Enter top, an integer between 3 and 29 (including): 20
Enter side, an integer between 2 and 20 (including): 6
Enter 0 for left-tilt or 1 for right-tilt of the side: 0

                    ####################
                   #@@@@@@@@@@@@@@@@@@@@#
                  #@@@@@@@@@@@@@@@@@@@@#
                 #@@@@@@@@@@@@@@@@@@@@#
                #@@@@@@@@@@@@@@@@@@@@#
               #@@@@@@@@@@@@@@@@@@@@#
              #@@@@@@@@@@@@@@@@@@@@#
             ####################

The number of characters on the perimeter:
The number of characters in the interior:
The number of characters of the parallelogram:
```

```
Enter top, an integer between 3 and 29 (including): 20
Enter side, an integer between 2 and 20 (including): 6
Enter 0 for left-tilt or 1 for right-tilt of the side: 1

          ####################
           #@@@@@@@@@@@@@@@@@@@@#
            #@@@@@@@@@@@@@@@@@@@@#
             #@@@@@@@@@@@@@@@@@@@@#
              #@@@@@@@@@@@@@@@@@@@@#
               #@@@@@@@@@@@@@@@@@@@@#
                #@@@@@@@@@@@@@@@@@@@@#
                 ####################

The number of characters on the perimeter:
The number of characters in the interior:
The number of characters of the parallelogram:
```

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2. (50 points) You may start with program skeleton **quiz1_skeleton_2.c** and change the file name to **quiz1_Dxxxxxxx_2.c**. Write a C program to perform the following steps:
   (a) Input three integers x, y, and z
   (b) Evaluate and print the results of expressions x+y*z, y+z*x, and z+x*y.
   (c) Print x+y*z, y+z*x, and z+x*y in the ascending order.
   (d) Print x+y*z, y+z*x, and z+x*y in the descending order.
   (e) Repeat steps (a) to (d) until the input values of x, y, and z are all zero's.

Example of program execution:

```
Input three integers x, y, and z: 2 4 6

The values of expressions x+y*z, y+z*x, and z+x*y: 26, 16, 14
Expressions x+y*z, y+z*x, and z+x*y in the ascending order: 14 16 26
Expressions x+y*z, y+z*x, and z+x*y in the descending order: 26 16 14

------------------------------------------------
Input three integers x, y, and z: 6 -4 2

The values of expressions x+y*z, y+z*x, and z+x*y: -2, 8, -22
Expressions x+y*z, y+z*x, and z+x*y in the ascending order: -22 -2 8
Expressions x+y*z, y+z*x, and z+x*y in the descending order: 8 -2 -22

------------------------------------------------
Input three integers x, y, and z: 0 0 0

The values of expressions x+y*z, y+z*x, and z+x*y: 0, 0, 0
Expressions x+y*z, y+z*x, and z+x*y in the ascending order: 0 0 0
Expressions x+y*z, y+z*x, and z+x*y in the descending order: 0 0 0

------------------------------------------------
End of program execution.
```