

Programming Fundamentals
Programming Assignment 2 – Figures

Introduction

For this assignment, you are to create a program in Java that asks the user to enter the size of a figure (must be odd), then displays a menu of 4 options. Options 1-3 will print various figures: box, diamond, X. Option 4 will allow the user to quit the program. You are to work on this assignment independently.

Program Design

- You should have a single class called `Figures`.
- You will have 4 static methods: `main`, `printBox`, `printDiamond`, and `printX`.
- The `printBox`, `printDiamond`, and `printX` methods should take as input an `int` parameter called `size` and print a box, diamond, or X shape respectively, of that given size. (see sample output at the end)
- The `main` method should do the following:
 1. Ask the user to enter a number for the size of the figure. This number needs to be an ODD integer. If the user enters a number that is not odd, ask him/her to reenter the number until it is odd.
 2. Enter a loop in which you will display a menu of choices (1-4) and wait for user input (see example at the end). The choices are: "1. Print box", "2. Print diamond", "3. Print X", and "4. Quit program".
 3. If options 1-3 are selected, print the corresponding figure shape with dimensions = `size × size`, by calling the appropriate method. The exception is the diamond figure, which will have `size` rows and `size+1` columns. See example for sample output.
 4. If option 4 is selected, quit the program and print "Good bye!".

Additional Requirements

1. The name of your Java Class that contains the main method should be `Figures`. All your code should be within a single file.
2. Your code should follow good coding practices, including good use of whitespace (indents and line breaks) and use of both inline and block comments.
3. You need to use meaningful identifier names that conform to standard Java naming conventions.
4. At the top of the file, you need to put in a block comment with the following information: your name, date, course name, semester, and assignment name.
5. Your program needs to handle invalid inputs gracefully. For example, entering a number outside of a valid range should not crash the program. Instead, the user should be prompted to enter the number again.
6. The output of your program should **exactly** match the sample program output given at the end.

What to Turn In

You will turn in the single `Figures.java` file using BlackBoard.

What You Need to Know for This Assignment

- Conditional statements
- Loops
- Getting user input
- Creating and calling methods

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PROGRAMMING ASSIGNMENT 2

Invalid figure size - must be an odd number

MENU:

- Please select an option: 1

MENU:

- Please select an option: 2

MENU:

- Please select an option: 3

```
X       X
X       X
X     X
X  X
X
X  X
X     X
X       X
X       X
```

MENU:

1. Print box
2. Print diamond
3. Print X
4. Quit program

Please select an option: 4

Good bye!

Sample Program Output 2

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NAME: [put your name here]

PROGRAMMING ASSIGNMENT 2

Enter the size of the figure (odd number): 5

MENU:

1. Print box
2. Print diamond
3. Print X
4. Quit program

Please select an option: 3

```
X  X
 X X
  X
 X X
X  X
```

MENU:

1. Print box
2. Print diamond
3. Print X
4. Quit program

Please select an option: 1

```
XXXXX
XXXXX
XXXXX
XXXXX
XXXXX
```

MENU:

1. Print box
2. Print diamond
3. Print X
4. Quit program

Please select an option: 2

```
  XX
 X  X
X    X
 X  X
  XX
```

MENU:

1. Print box
2. Print diamond
3. Print X
4. Quit program

Please select an option: 4

Good bye!
