

INTRODUCTION TO COMPUTER SCIENCE I

PROJECT 1

More pretty patterns!

This larger project builds on your work in Lab 4. We're going to add to the patterns and exercise all of the structures—*conditional statements*, *iterative statements (loops)*, and *methods/method calls*.

1 Getting started

Per usual: Login, terminal, new directory.

Having done that, open a brand new source code file in Emacs, named `PrettyPatterns.java`. Once that window opens, you'll notice that the file is blank (because it's new!). You can copy and paste from your Lab-4 code as needed, but this is a program that you must create from scratch.

2 More pretty patterns

What this program should do is best describe by the following example. That is, your program should behave like this:

```
Select a pattern type to print:
```

```
(0) Exit
(1) Left-leaning triangle
(2) Right-leaning-triangle
(3) Empty square
(4) Non-sectarian holiday bush
```

```
Enter a choice (0 - 4): 8
```

```
Enter a choice (0 - 4): -2
```

```
Enter a choice (0 - 4): 1
```

```
Enter a size (>= 2): 5
```

```
.
..
...
....
.....
```

Select a pattern type to print:

- (0) Exit
- (1) Left-leaning triangle
- (2) Right-leaning-triangle
- (3) Empty square
- (4) Non-sectarian holiday bush

Enter a choice (0 - 4): 2

Enter a size (≥ 2): 4

```
.  
..  
...  
....
```

Select a pattern type to print:

- (0) Exit
- (1) Left-leaning triangle
- (2) Right-leaning-triangle
- (3) Empty square
- (4) Non-sectarian holiday bush

Enter a choice (0 - 4): 3

Enter a size (≥ 2): 6

```
.....  
.      .  
.      .  
.      .  
.      .  
.....
```

Select a pattern type to print:

- (0) Exit
- (1) Left-leaning triangle
- (2) Right-leaning-triangle
- (3) Empty square
- (4) Non-sectarian holiday bush

Enter a choice (0 - 4): 4

Enter a size (≥ 2): -15

Enter a size (≥ 2): 0

Enter a size (≥ 2): 1

Enter a size (≥ 2): 5

```
      *
     ...
    .....
   .....
  .....
 .....
 |
```

Select a pattern type to print:

- (0) Exit
- (1) Left-leaning triangle
- (2) Right-leaning-triangle
- (3) Empty square
- (4) Non-sectarian holiday bush

Enter a choice (0 - 4): 0

Goodbye!

3 Your assignment

Write a program that behaves like the example in Section 2. There are a few basic requirements for how you write this code:

- **Methods:** Break your program into a number of methods that call one another. `main()` can contain the loop that repeatedly asks the user to choose a pattern type, and then calls a method to print that pattern. Each pattern should have its own method for directing its printing. Some *helper methods* (e.g., `printRow()` from Lab-4) may be called in service of multiple pattern-printing methods.
- **Comments:** With lines that begin with the *comment marker*, which is two forward slashes (e.g., `//`), write human-to-human notes about what your code is doing. Each method or block of statements should have a brief comment to explain what that code does.
- **Names:** All variables and methods should have descriptive names. Obvious counter variables can have common mathematical names (e.g., `i`), but any other variable name should be a noun. Likewise, method names should be verbs.
- **Work alone:** For regular labs, we're often loose about a certain amount of working together, and for labs, a bit of collaboration is acceptable. **Not for projects.** You may neither show someone your code, nor may you see another's code.¹ You must do your own work.

One last tip: **Work incrementally.** Don't try to write all of the methods before testing anything you've written. Figure out what the next, small, testable addition to the code could be. Write that, compile it, test that it works. Only then should you move on to the next such addition.

4 How to submit your work

Use the CS submission systems to submit your work. Specifically, you will need to submit your `PrettyPatterns.java` file. You may use either of the following two methods, while connected to `remus` or `romulus`, to use the submission system:

- **Web-based:** Visit the submission system web page.
- **Command-line based:** Use the `~lamcgeoch/submit` command at your shell prompt.

This assignment is due on Monday, Mar-07, 11:59 pm, before it becomes Tuesday, Mar-07.

¹That includes, of course, any online sources.