

Lesson 32: printTriangle() Revisited (W10D1)

Balboa High School

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Do Now (this is the lesson!)

- Create a class called `StarPrinter2` in a new project, `Lesson32`.
- This is an independent activity but, if you get stuck, feel free to ask someone to check over your code and offer suggestions.
- Write a method — `makeStars()` — that takes an integer and returns that number of asterisks as a `String`. E.g., `makeStars(3)` returns `***`
- Write another method — `makeTriangle()` — that takes an integer and returns a `String` that represents a triangle of asterisks. E.g., `makeTriangle(4)` returns `*\n**\n***\n****`. **This method must call `makeStars()`!**
- Write a `main()` method that makes this method call:
`System.out.println(makeTriangle(3));`

Students will learn how to develop a program using a top-down and bottom-up methodology.

Extension Activity #1

Take the "Do Now" program and alter it so that `makeTriangle(4)` returns `****\n***\n**\n*`

Extension Activity #2

Make the program output the following by adding a `while()` loop to `main()`:

```
*****
```

```
****
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***
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*****
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***
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**
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***
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*
```

```
**
```

```
*
```

Extension Activity #3

Make `main()` create and print the output from the last activity **without** calling any other methods. You will probably want to use *nested* `while()` loops, or `while()` loops within `while()` loops. This is challenging!

Extension Activity #4: Challenge!

Write two recursive methods:

- `wideTopTriangleRec()` takes an `int`, `n`, and returns a `String` that, when printed, gives a triangle with `n` `*`s on top and one `*` on the bottom. You may use `makeStars()`.
- `wideBaseTriangleRec()` takes an `int`, `n`, and returns a `String` that, when printed, gives a triangle with one `*` on top and `n` `*`s on the bottom. Again, you may use `makeStars()`.

Added Challenge: If you finish, write a new version of `makeStars()` called `makeStarsRec()` that doesn't use iteration, and have your `wide*TriangleRec()` methods use `makeStarsRec()`!

Come to class having finished all of §§1-3 of PS #5
(i.e., you are ready to begin §4).