Java Library

A library is a bunch of code that other people have written, that we may use in our program!

We don't need to understand *how* that code was written in order to use it.

Some libraries require *imports* at the top of our code.

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Pseudo-Randomness

Computers generate numbers in a predictable way using mathematical formulas.

Input may include current time, mouse position, etc.

True randomness is hard to achieve – we rely on natural processes
- e.g., atmospheric noise, lava lamps

(PCM) Random

A Random object generates *pseudo*-random numbers.

- The Random class is found in the `java.util` package

```
import java.util.*;
```

Method	Description
`nextInt()`	Returns a random integer
`nextInt(max)`	Returns a random integer in the range [0, *max*), or in other words, 0 to *max*-1 inclusive
`nextDouble()`	Returns a random real number in the range [0.0, 1.0)

(PCM) Math

Calling:
`Math.<method>(…)`

Method	Description
`Math.abs(value)`	Returns the absolute value of *value*
`Math.ceil(value)`	Returns *value* rounded up
`Math.floor(value)`	Returns *value* rounded down
`Math.max(value1, value2)`	Returns the larger of the two values
`Math.min(value1, value2)`	Returns the smaller of the two values
`Math.round(value)`	Returns *value* rounded to the nearest whole number
`Math.sqrt(value)`	Returns the square root of *value*
`Math.pow(base, exp)`	Returns *base* raised to the *exp* power

🐢 Turtle Time!

🐢 Turtles!

`Turtle donatello = new Turtle();`

Method	Description
`forward(n)`	Moves the turtle forward by *n* steps
`backward(n)`	Moves the turtle backward by *n* steps
`right(d)`	Turns the turtle right by *d* degrees
`left(d)`	Turns the turtle left by *d* degrees
`speed(ms)`	Sets the number of milliseconds it takes for the turtle to perform an action (e.g., if *ms* is 1000, then it will take the turtle 1000 ms = 1 second to perform an action like moving forward or turning).
`up()`	Picks up the turtle's pen so it doesn't draw when it moves
`down()`	Puts the turtle's pen down so it draws when it moves
`width(w)`	Sets the width of the turtle's pen to *w* pixels wide
`penColor(c)`	Sets the color of the turtle's pen to *c*

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