

# Software Engineering Design & Construction

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Single Responsibility Principle

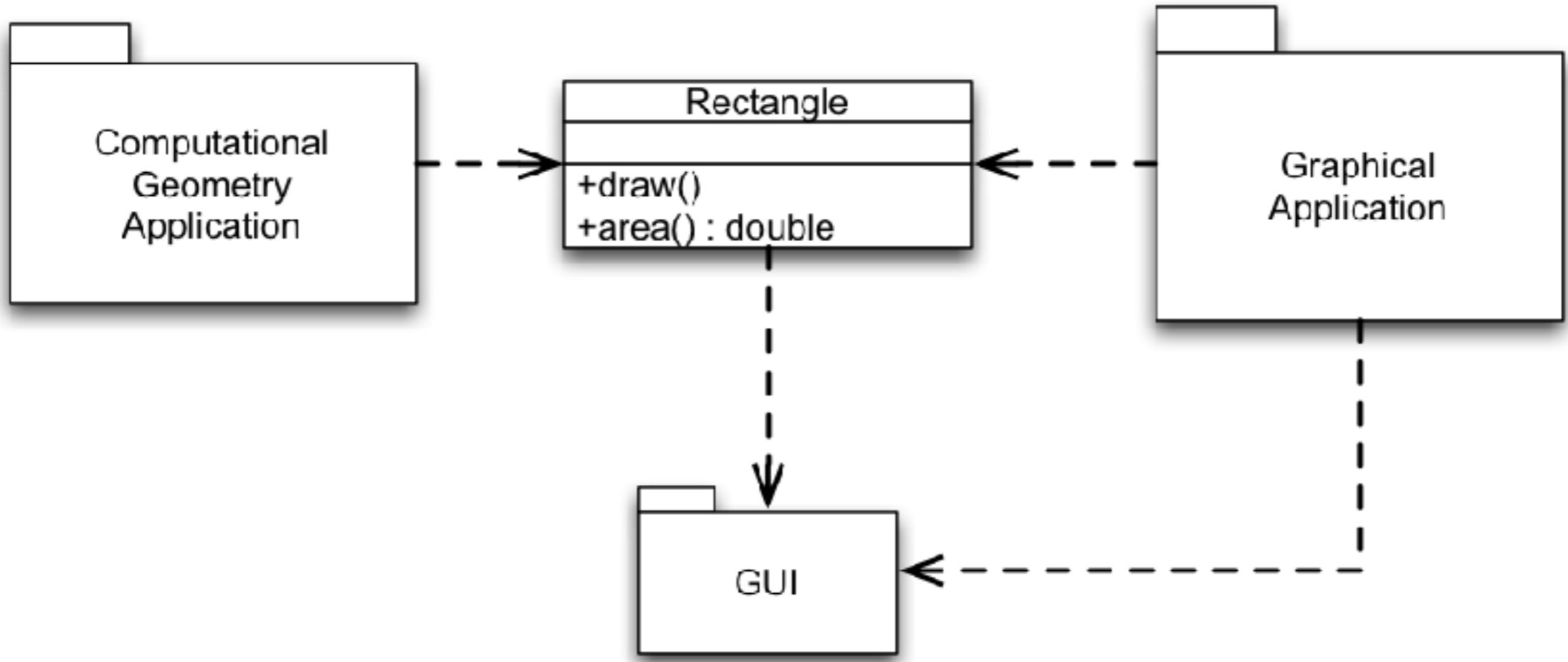
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# *Single **R**esponsibility **P**inciple*

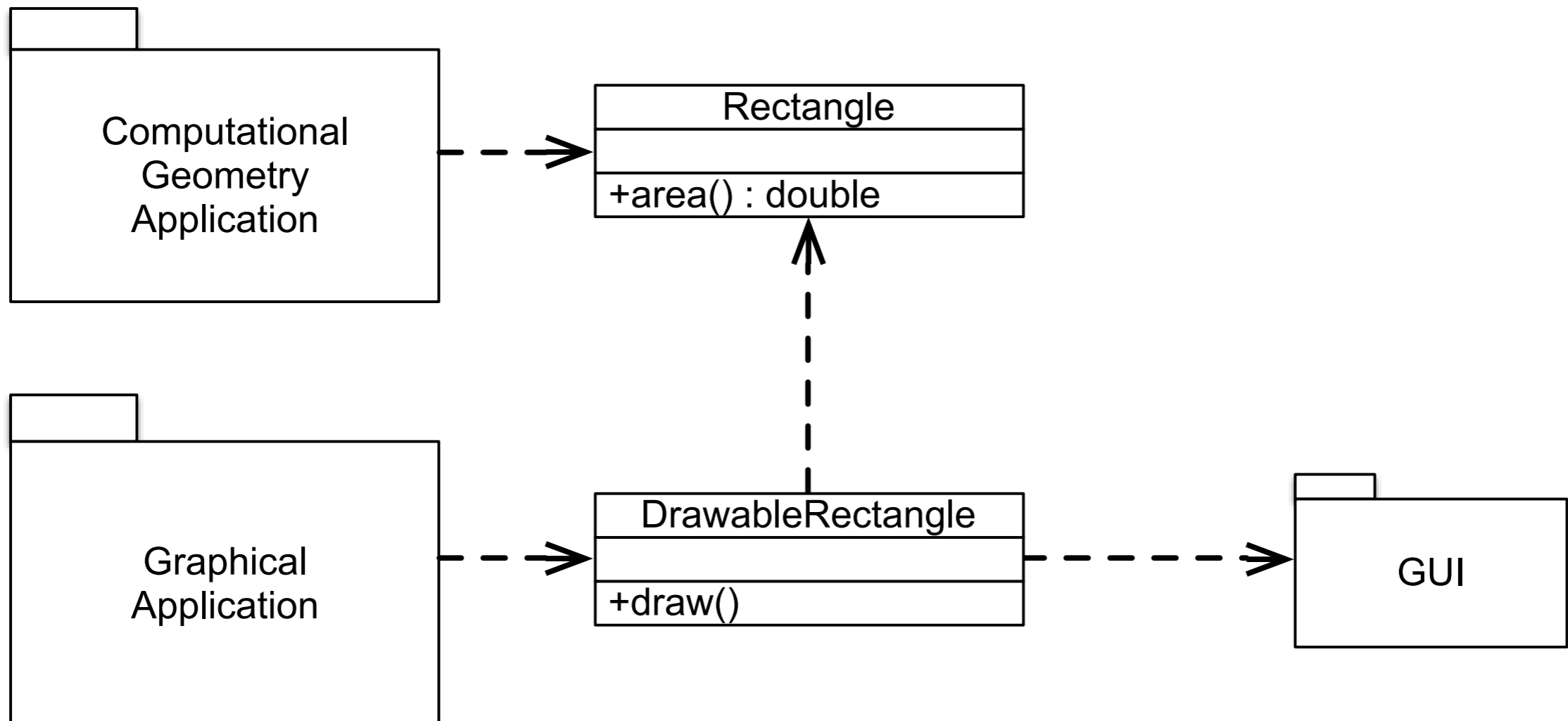
*A class should have only one reason to change.*

–Agile Software Development; Robert C. Martin; Prentice Hall, 2003

What do you think of the following design?



# A Single-Responsibility Compliant Design



# Responsibility

- In general, a class is assigned the responsibility to know or do something (one thing).
- Examples:
  - Class **PersonData** is responsible for knowing the data of a person.
  - Class **CarFactory** is responsible for creating **Car** objects.
- A responsibility is an axis of change.
- A class with only one responsibility has only one reason to change!

# Cohesion

(conceptual view)

- Cohesion measures the degree of togetherness among the elements of a class.
- In a class with high cohesion **every element is part of the implementation of exactly one concept**. The elements of the class work together to achieve one common functionality.
- A class with high cohesion often implements only one responsibility.

# SRP and Cohesion

- Applying the single-responsibility principle maximizes the cohesion of classes.
- Classes with high cohesion ...
  - can be reused easily,
  - are easily understood,
  - protect clients from changes, that should not affect them.

# java.util.Date

Do we have a SRP Violation?

- The class **Date** represents a specific instant in time, with millisecond precision.

<b>int</b>	getSeconds()
<b>long</b>	getTime()
<b>int</b>	getTimezoneOffset()
<b>int</b>	getYear()
<b>int</b>	hashCode()
<b>static long</b>	parse(String s)
<b>void</b>	setDate(int date)
<b>void</b>	setHours(int hours)
<b>void</b>	setMinutes(int minutes)
<b>...</b>	...



# java.util.Date

Do we have a SRP Violation?

- The class **Date** represents a specific instant in time, with millisecond precision.

- 

...

```
public static long parse(String s)
```

*Attempts to interpret the string s as a representation of a date and time. If the attempt is successful, the time indicated is returned represented as the distance, measured in milliseconds, of that time from the epoch (00:00:00 GMT on January 1, 1970). If the attempt fails, an IllegalArgumentException is thrown.*

...

Do perform the strategic application of principles!

Only apply a principle,  
if there is a symptom!