



# Single Responsibility

Everything Does One Thing

# In the Real World

- Groups work together by individuals doing their own jobs

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Higher Education: Colleges and Courses

Team Sports

Assembly Lines

Departments in Organizations

# Why Worry about Responsibility?

- Maintainable code
- Reusable code
- Testable code

# Responsibility Concepts

- Single responsibility
- Separation of concerns

# Responsibility Concepts

- Single responsibility of methods
- Separation of concerns between classes

# Single Responsibility of Methods

- Each method should do one thing

# #prime\_factors

- Return the prime factors of a given number



# #prime\_factors

```
def prime_factors(number)
  # ...
end
```

# #prime\_factors

```
def prime_factors(number)
  # some stuff ...
  # do if is_prime?(factor)
  # more stuff ...
end
```

# #prime\_factors

```
def prime_factors(number)
  # some stuff ...
  # do if is_prime?(factor)
  # more stuff ...
end
```

```
def is_prime?(n)
  (2..n / 2).each do |factor|
    if (n % factor == 0)
      return false
    end
  end
  true
end
```

# #prime\_factors

```
def prime_factors(number)
  # some stuff ...
  # do if is_prime?(factor)
  # more stuff ...
end
```

```
def is_prime?(n)
  possible(n).each do |pssibl|
    if is_factor?(n, pssibl)
      return false
    end
  end
  true
end
```

```
def possible(n); (2..n / 2) end
```

```
def is_factor?(n, factor)
  (n % factor).zero?
end
```

# #prime\_factors

```
def prime_factors(number)
  # some stuff ...
  # do if is_prime?(factor)
  # more stuff ...
end
```

```
require 'Prime'

def is_prime?(n)
  Prime.prime?(n)
end
```

# Separation of Concerns

- The purpose of a class should be the “smallest possible useful thing.”

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- The purpose of a class should be the “smallest possible useful thing.”
- Everything the class does should be related to it’s purpose.

# Separation of Concerns

- What if we have a Cohort and we're parsing CSV rows into Student objects, what concerns are there?



# Separation of Concerns

- What if we have a Cohort and we're parsing CSV rows into Student objects, what concerns are there?
  - Cohort state and behaviors
  - Student state and behaviors
  - Reading and writing CSV

# Separation of Concerns

- Whose concern is parsing CSV?

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What if the Cohort class  
parses the CSV into Student objects?

# Separation of Concerns

- Whose concern is parsing CSV?

What if the Student class  
parses the CSV into Student objects?

# Separation of Concerns

- Whose concern is parsing CSV?

What if there were  
a StudentParser class?

# Separation of Concerns

- Whose concern is parsing CSV?

What if there were  
a CSVParsing module?

# Design Criteria Sample

- Maintainable code
- Reusable code
- Testable code

# Separation of Concerns

- What happens if the requirements change and a Cohort also needs Instructor objects parsed from CSV?



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- What happens if the requirements change and a Cohort also needs Instructor objects parsed from CSV?

How well did your design choice respond to a change in requirements?