

1. Create an *Product* class.

A *product* has

- A name
- A price
- A quantity

This class “looks” like

Product
name
price
quantity

Create a constructor method that initializes all instance variables.

You should write getters and setters for each of the instance variables.

Instantiate an instance of the class. You may pass any initial values of your choosing.

2. Create a *Book* class.

A *Book* has

- title
- author
- page_count

This class “looks” like

Book
title
author
page_count

Create a constructor method that initializes all instance variables.

You should write getters and setters for each of the instance variables.

Instantiate an instance of the class. You may pass any initial values of your choosing.

3. Create a *Movie* class.

A *Movie* has

- title
- director
- runtime_minutes

This class “looks” like

Movie
title
director
runtime_minutes

Create a constructor method that initializes all instance variables.

You should write getters and setters for each of the instance variables.

Instantiate an instance of the class. You may pass any initial values of your choosing.

4. Create a *Song* class.

A *Song* has

- title
- artist
- duration_seconds

This class “looks” like

Song
title
artist
duration_seconds

Create a constructor method that initializes all instance variables.

You should write getters and setters for each of the instance variables.

Instantiate an instance of the class. You may pass any initial values of your choosing.

5. Create a *Vehicle* class.

A *Vehicle* has

- make
- model
- year

A *Vehicle* can do

- *print_vehicle_type*

This class “looks” like

Vehicle
make
model
year
print_vehicle_type

Create a constructor method that initializes all instance variables.

You should write getters and setters for each of the instance variables.

Instantiate an instance of the class. You may pass any initial values of your choosing.

Write a method called *print_vehicle_type*, which prints in the form “[year] [make] [model]” example. “2021 Toyota Camry”.

6. Create a *Course* class.

A *Course* has

- course_code
- course_name
- instructor

An *Course* can do

- *print_info*

This class “looks” like

Course
course_code
course_name
instructor
print_info

Create a constructor method that initializes all instance variables.

You should write getters and setters for each of the instance variables.

Instantiate an instance of the class. You may pass any initial values of your choosing.

Write a method called *print_info*, which prints in the form

“[course_code]: [course_name] taught by [instructor]”

example. “CIS101: Introduction to programming taught by Matt”.

7. Create a *Point* class.

A *Point* has

- x_coordinate
- y_coordinate

A *Point* can do

- *print_info*

This class “looks” like

Point
x_coordinate
y_coordinate
print_info

Create a constructor method that initializes all instance variables.

You should write getters and setters for each of the instance variables.

Instantiate an instance of the class. You may pass any initial values of your choosing.

Write a method called *print_info*, which prints in the form

“(x,y)=([x_coordinate], [y_coordinate])”

example. “(x,y)=(4, 5)”.

8. Create an *Employee* class.
An *Employee* has

- A name
- A title
- A salary

An *Employee* can do

- a greeting
- request raise

This class “looks” like

Employee
name
title
salary
greeting
request_raise

You should write getters and setters for each of the instance variables.

A greeting should be of the form: Hello. My name is *name*. I’m the *title*.
eg. Hello. My name is Eugene. I’m the CEO.

A raise request should request a 6% raise.

It should be of the form: I’m currently making *salary*. I’d like new salary of *new amount*.
eg. I’m currently making \$100. I’d like new salary of \$106.

9. Create a *Student* class.
A *Student* has

- A name
- A major
- A GPA

A *Student* can do

- introduce themselves
- study for exam

This class “looks” like

Student
name
major
GPA
introduce
study_for_exam

You should write getters and setters for each of the instance variables.

An introduction should be of the form: Hi, I’m *name*. I’m studying *major*.
eg. Hi. I’m Maria. I’m studying Computer Science.

Studying for an exam should increase the GPA by 0.2 points. (up to a maximum of 4.0)

It should be of the form:

I’m hitting the books! My GPA increased from *old GPA* to *new GPA*.
eg. I’m hitting the books! My GPA increased from 3.5 to 3.7.

10. Create a *Vector* class.

A *Vector* has

- x_direction
- y_direction

A *Vector* can do

- get_magnitude

This class “looks” like

Vector
x_direction
y_direction
get_magnitude

Create a constructor method that initializes all instance variables.

You should write getters and setters for each of the instance variables.

Instantiate an instance of the class. You may pass any initial values of your choosing.

Hint: magnitude is calculated as $\sqrt{x^2 + y^2}$.

11. Create a *ColorRGB* class.

A *ColorRGB* has

- red
- green
- blue

A *ColorRGB* can do

- to_grayscale

This class “looks” like

ColorRGB
red
green
blue
to_grayscale

Create a constructor method that initializes all instance variables.

You should write getters and setters for each of the instance variables.

Instantiate an instance of the class. You may pass any initial values of your choosing.

The to_grayscale() method should return the grayscale value calculated as:

$$0.3 * \text{red} + 0.59 * \text{green} + 0.11 * \text{blue}$$

That is, it will just return a number (a float).

12. Create a *TemperatureInCelsius* class.

A *TemperatureInCelsius* has

- temp_value

A *TemperatureInCelsius* can do

- to_fahrenheit

This class “looks” like

TemperatureInCelsius
temp_value
to_fahrenheit

Clarification: temp_value is the temperature in Celsius.

Create a constructor method that initializes all instance variables.

You should write getters and setters for each of the instance variables.

Instantiate an instance of the class. You may pass any initial values of your choosing.

The to_fahrenheit() method should return the temperature in Fahrenheit calculated as:

$$\text{Fahrenheit} = (\text{Celsius} * 9/5) + 32.$$

13. Create a *Rectangle* class.

A *Rectangle* has

- width
- height

A *Rectangle* can do

- calculate_area

This class “looks” like

Rectangle
width
height
calculate_area

Create a constructor method that initializes all instance variables.

You should write getters and setters for each of the instance variables.

Instantiate an instance of the class. You may pass any initial values of your choosing.

The calculate_area() method should return the area calculated as: width * height.

14. Create a *Circle* class.

A *Circle* has

- radius

A *Circle* can do

- calculate_circumference

This class “looks” like

Circle
radius
calculate_circumference

Create a constructor method that initializes all instance variables.

You should write getters and setters for each of the instance variables.

Instantiate an instance of the class. You may pass any initial values of your choosing.

The calculate_circumference() method should return the circumference calculated as: $2 \cdot \pi \cdot \text{radius}$.