

Assignment #5

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Exercise 1

Implement a class that models a *tally counter*, a mechanical device that is used to count people—for example, to find out how many people attend a concert or board a bus. Whenever the operator pushes a button, the counter value advances by one. Model this operation with a `count` member function. A physical counter has a display to show the current value. In your class, use a `get_value` member function instead.



Exercise 2

Implement a class `Rectangle`. Provide a constructor to construct a rectangle with a given width and height, member functions `get_perimeter` and `get_area` that compute the perimeter and area, and a member function `void resize(double factor)` that resizes the rectangle by multiplying the width and height by the given factor.

Exercise 3

Implement a class `Student`. For the purpose of this exercise, a student has a name and a total quiz score. Supply an appropriate constructor and functions `get_name()`, `add_quiz(int score)`, `get_total_score()`, and `get_average_score()`. To compute the latter, you also need to store the *number of quizzes* that the student took.

Exercise 4

Design a class `Message` that models an e-mail message. A message has a recipient, a sender, and a message text. Support the following member functions:

- A constructor that takes the sender and recipient and sets the time stamp to the current time
- A member function `append` that appends a line of text to the message body
- A member function `to_string` that makes the message into one long string like this: "From: Mohamed Yacine\nTo: Nacer Billal\n ..."
- A member function `print` that prints the message text. Hint: Use `to_string`.

Write a program that uses this class to make a message and print it.

Exercise 5

Design a class `Mailbox` that stores e-mail messages, using the `Message` class of Exercise 4. Implement the following member functions:

```
void Mailbox::add_message(Message m)
Message Mailbox::get_message(int i) const
void remove_message(int i)
```