

Open Source Practice

Homework #2

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Due date: June 14, 2019

Problem 1

Implement a `VotingMachine` class that can be used for a simple election. Have methods to clear the machine state, to vote for a Democrat, to vote for a Republican, and to get the tallies for both parties.

Problem 2

Provide a class `Letter` for authoring a simple letter. In the constructor, supply the names of the sender and the recipient:

```
def __init__(self, letterfrom, letterto)
```

Supply a method

```
def addLine(self, line)
```

to add a line of text to the body of the letter. Supply a method

```
def get_text(self)
```

that returns the entire text of the letter. The text has the form:

Dear recipient name:

first line of the body

second line of the body

...

last line of the body

Sincerely,

sender name

Problem 2

Test the class with a driver program that prints the following letter.

Dear Dankook:

Everyone in our school always do the best.
They have their own plan for the future.

Sincerely,

Dooly

Problem 3

Write functions

```
def sphere_volume(r)
def sphere_surface(r)
def cylinder_volume(r, h)
def cylinder_surface(r, h)
def cone_volume(r, h)
def cone_surface(r, h)
```

that compute the volume and surface area of a sphere with radius r , a cylinder with a circular base with radius r and height h , and a cone with a circular base with radius r and height h . Place them into a `geometry` module. Then write a driver program that prompts the user for the values of r and h , calls the six functions, and prints the results.

Problem 4

Solve Problem 3 by implementing classes `Sphere`, `Cylinder`, and `Cone`. Write a driver program that tests these classes.

1. Does your code give the same result when you input the same values?
2. Discuss which approach is more object-oriented.

Problem 5

Test the C program(`test.c`) to sort array. Split the program into more than 4 files and write a `Makefile` to generate an execution file. Show the test result and check if your result is the same as that of `test.c`.

Problem 6

Test the C program(`test.c`) to sort array. Split the program into more than 4 files and write a `CMakeLists.txt` to generate an execution file. Show the test result and check if your result is the same as that of `test.c`.