

## Problem Statement - OOP Lab 1

**BITS Goa** administration decided to build a colony for faculty quarters.

A **colony** is given a name and consists of a group of houses with an upper limit of **10**.

Each **house** has a house number associated with it and a certain number of people living in it.

Due to space limitations, each house must contain a maximum of 5 rooms.

A **room** has length, breadth and height.

Some rooms might have all three parameters equal to each other built in a cube shape while the others may be cuboidal in shape.

Administration decides to collect a nominal annual maintenance amount from the faculties living in the Colony. For this, they decide to monitor the annual maintenance cost of the colony.

The annual Maintenance cost of each house is calculated by the usage of water and electricity plus the annual painting cost and land tax to be paid to the Government.

Water and power usage are calculated based on the number of people residing in the house.

Painting and land tax are based on the lateral surface area and floor area of each room inside a particular house.

Annual water usage cost associated with per person is **Rs 300**

Annual power usage cost associated with per person is **Rs 600**

Annual painting cost associated with per square meter is **Rs 5**

Annual land tax associated with per square meter is **Rs 40**

The houses having house numbers which are multiples of 3 are among the less preferred houses. So the administration offers to reduce the total annual maintenance cost by **Rs 100** for faculty families who decide to live in them.

The administration wants you to help them create some classes to look after the colony.

You are required to create 3 classes for this lab: Room Class, House Class and the Colony Class.

For all the information use the Javadoc ([index.html](#)). It contains all the information regarding all methods & variables for the classes to be made.

## TEST CASES

Please try to attempt in the order mentioned for maximum marks

Without constructors other test cases won't work, so complete them first.

1. Room Constructor
2. Room Lateral & Floor Area methods
3. House Constructor
4. *addRoom* methods in House Class
5. *getCostofPaint* in House Class
6. *getMaintenanceCost* in House Class
7. Colony Constructor
8. *getColonyName* in Colony Class
9. *addHouse* in Colony Class
10. *getMaintenanceCost* in Colony Class