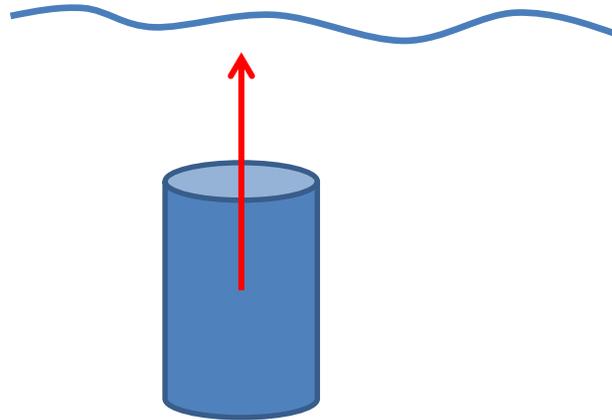


Density and Buoyancy

• Density:

$$\rho = \frac{\text{Mass}}{\text{Volume}}$$



$$\text{Bouyancy Force} = \rho_{\text{fluid}} V g$$

here V is the volume of **submerged part** of the body,
 $g=9.8\text{m/s}^2$.

Homework 20

Problem 1

Currently the largest container ship in the world is Ever Alot. When fully loaded, its mass can reach 240,000 tons (1 ton = 1000 kg).

Density of seawater is 1030 kg/m^3 .

- 1) What is the volume of the submerged part of the fully loaded ship?
- 2) The ship is 400 meters long and 60 meters wide. What is the height of the underwater part?

Problem 2

A hot air balloon has volume 2500 m^3 , and is filled with hot air.

Density of hot air is 1 kg/m^3 , while density of the atmospheric air around it is 1.3 kg/m^3 . The mass of the balloon envelope is 400 kg.

What is the maximal load the balloon could carry?

Pictures – no need to print

