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MIS200 Assessment 1 Case Study

A civil engineering company called Build Bold has approached you to write some programs to help some of their employees with getting their job quicker specially when it comes to calculation of different physical equations in their construction projects. In this company, a project manager assigns tasks to employee and writes a report in the system about their performance. An architect is responsible to design and upload the house plans in the system. Each design requires approval by City Council. A contractor can access the designs and find proper land plots. The design will then be sent to case workers. Customers can navigate the system, choose their favourite design, and request for inspecting the display house. Each inspection might require the approval of the case manager. Builders can use an advanced calculator in the system to calculate some of the equations that they need during the construction.

In this assessment, you are first required to draw a use case diagram for this scenario. Then, implement the following functionalities should be implemented for one of the use cases for the builders:

(a) Write the code for these two equations. Let R=10000, C=1e-6, and Vs=10.

$$T=RC$$

$$Vc=Vs(1-10^{-\frac{t}{T}})$$

The builder will enter t.

(b) Write the code to implement the equation below (ignore the units).
Let $G = 6.67 \times 10^{-11} m^3 kg^{-1} s^{-2}$ and r = 384e6 m.

$$F_g = G \cdot \frac{m_1 \cdot m_2}{r^2}$$

The user will enter m_1 and m_2.

(d) Code all these equations.

$$\left(\frac{6^{(2+a)}}{4+b}\right) + (c + 180) \times \left(\frac{b}{a}\right) \times \frac{6 + \frac{2 \cdot 8}{3} - 3^{2.5}}{\frac{4}{3} \times \frac{7}{3 \times 2.4}}$$

The builder will enter all the parameters

(e) Programs to covert the following units (the builder will enter the first unit in each case):

- centimetre to millimetre
- feet to meter
- kilometres to meter
- pound to kilogram
- yard to inch