Software Engineering and Programming Basics - WS2021/22
Assignment 7

TECHNISCHE UNIVERSITÄT
CHEMNITZ

Professorship of Software Engineering

1| 2022

Organisational

Deadline

18.01.2022 - 23:59

Submission

To submit your answers, please use the Task item titled 'Submission' in the menu of the Assignment 7. You can upload your /.java files here. There are sample files shown in the highlighted Samples section.

Please remember that package name is the name of assignment, i.e. assignment7.

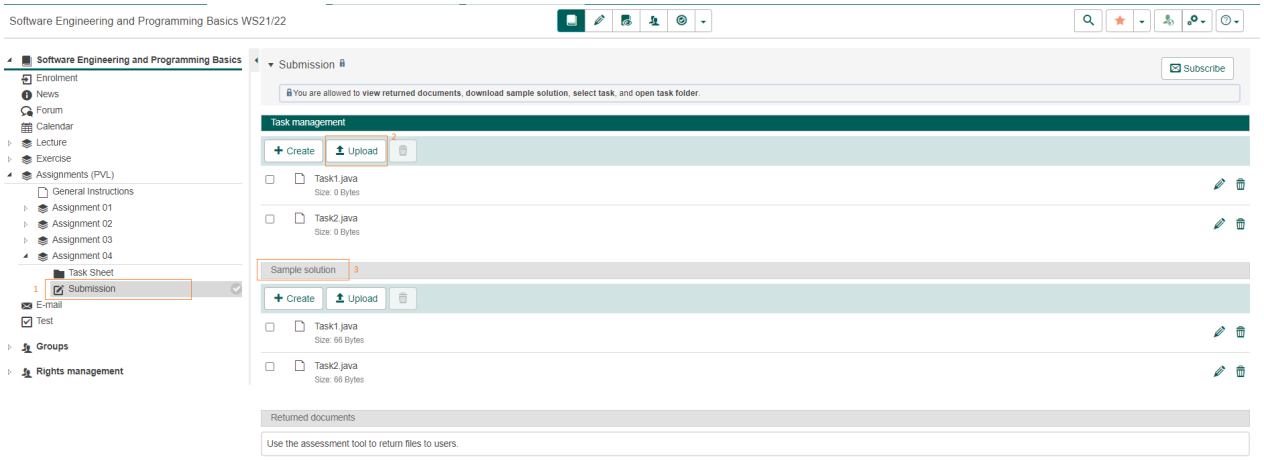
Make sure your files are correctly named: Package, class and method names should be exactly as mentioned on the Task Sheet in order to get grades.

This is an automated checking system. If the uploaded files have wrong names then your code will not be graded.

You also need to adhere to the General Assignment Instructions.

Questions

Since this is a PVL, it is important that all students are able to access all necessary information. Therefore, if you have any questions, please ask them in the course forum in the thread
'Assignment 7: Questions'.



Task 1

- Write an enum named **Planet** that represents the planets in the solar system. They are defined with constant mass and radius properties. Each enum constant is declared with values for the mass and radius parameters. These values are passed to the constructor when the constant is created.

  For example:
  MERCURY (3.303e+23, 2.4397e6)
  VENUS (4.869e+24, 6.0518e6)
  EARTH (5.976e+24, 6.37814e6)
  MARS (6.421e+23, 3.3972e6)
  JUPITER (1.9e+27, 7.1492e7)
  SATURN (5.688e+26, 6.0268e7)
  URANUS (8.686e+25, 2.5559e7)
  NEPTUNE (1.024e+26, 2.4746e7)

  Write a **constructor** in this class and **getter methods** for the required attributes.

- Write another class **TestPlanet**, this class should have two methods:

  – surfaceGravity of type double, this method returns the Surface Gravity on any planet, you can count it by using formula Gravitational constant * mass / (radius * radius).

  – surfaceWeight of type double, this method takes mass as a parameter and returns Surface Weight on any planet by using formula mass* Surface Gravity.

  – Write a main method in this class that displays your personal weight on each planet.

Notes: Java requires that the constants be defined first, prior to any fields or methods. Also, when there are fields and methods, the list of enum constants must end with a semicolon.

You can create variable for Gravitational constant (m3 kg-1 s-2) and give it values 6.67300E-11, Creation of variable should be decided based on your class structures.

Expected Output:
Your weight on MERCURY is 66.107583
Your weight on VENUS is 158.374842
Your weight on EARTH is 175.000000
Your weight on MARS is 66.279007
Your weight on JUPITER is 442.847567
Your weight on SATURN is 186.552719
Your weight on URANUS is 158.397260
Your weight on NEPTUNE is 199.207413

Task 2

Task 2 is based on recursion and to test your understanding of the concept we have designed a study. In this study we show you eight algorithms. First, you see a blurred image with only certain parts of code visible, please focus on these parts. In the next step, you see the whole image, and you have to understand the code and write your answers in the given field.

Once you have reached the last page of the study, you have to enter your matriculation number (please note that this part is important, as we can only give points based on your matriculation number).

Link to the study: https://www.soscisurvey.de/Gazedirectlink/

Information on Grading: You will get 1 point for attempting the study + up to 4 points for correct answers (0.5 point for each algorithm (0.5 * 8 = 4)).