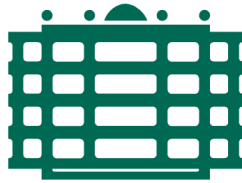# Software Engineering and Programming Basics - WS2021/22
Exercise 3: Classes & Objects

TECHNISCHE UNIVERSITÄT
CHEMNITZ

Professorship of Software Engineering

10| 2021

Task 1

A circle is defined as the set (or locus) of points in a plane with an equal distance from a fixed point. The fixed point is called the center, and the distance from the center to a point on the circle is called the radius. A constructor in Java is a special method that is used to initialize objects. The constructor is called when an object of a class is created. It can be used to set initial values for object attributes. Constructors can also take parameters, which are used to initialize attributes.

The **Circle** class represents circles. A circle has a color ("red", "yellow", "blue"), and a radius. The **Instance Variables** in our class are: **radius (of type double)** and **color (of type String)**. Our class has three **instance methods:** getRadius(), getColor() and getArea().

The **Constructors** in our class are called c1, c2, and c3.
1. Circle c1 with two parameters radius and color
2. Circle c2 with one parameter radius
3. Circle c3 with no parameters

Write a program which displays radius, color and area of each circle.

Example:
1. Circle c1 radius = 2.0 and color = blue
2. Circle c2 radius = 2.0
3. Circle c3 no parameters
Expected Output:
The radius is: 2.0 The color is: blue The area is: 12.57
The radius is: 2.0 The color is: orange The area is: 12.57
The radius is: 1.0 The color is: red The area is: 3.14

Task 2

A class called **Employee**., which models an employee with a name, salary and Hiring date, is designed. This employee class has three **Instance Variables:** name (type string), salary (type double) and hireDay (type Date)

Class Employee has three **Private methods:** getName(), getSalary() and getHireDay()

The **Constructor** in our class has five parametes name of type string, salary of type double, year of type integer, month of type integer and day of type integer.

Employee(String n, double s, int year, int month, int day)

Note: Use GregorianCalendar to find the date. GregorianCalendar is a concrete subclass of Calendar and provides the standard calendar system used by most of the world.

Write another class EmployeeTest. In this class, define three objects of class Employee. write a method raiseSalary() that calculates the new salary with increased percentage. Increase the salary of each employee by 5% and print out information about all Employee objects.

Expected Output:
Name = Carl Cracker
New salary = 78750.0
Hired on day: Tue Dec 15 00:00:00 CET 1987
Name = Harry Hacker
New salary = 52500.0
Hired on day: Sun Oct 01 00:00:00 CET 1989
Name = Tony Tester
New salary = 42000.0
Hired on day: Thu Mar 15 00:00:00 CET 1990