

ECE 220 – Computer Programming for Engineering – Winter 2017**Laboratory/Assignment: “OO...”
Lab/Assignment****Objective**

The goal of this lab/assignment is to make you familiar with principles of object-oriented programming. In particular, you will be asked to perform a number of small programming exercises that allow you to learn basics of creating classes and their methods, creating instances, as well as be exposed to the concept of inheritance.

IMPORTANT: This lab should be done individually.

Development Environment

IMPORTANT: the whole lab/assignment should be done on the website called CPP.SH (<http://cpp.sh>). Both classes BankAccount and saveBankAccount should be in one file.

Submission

The submission of this lab should be done via eClass. Copy and paste your work from cpp.sh. Your code HAS TO WORK (be compiled and executed) on this website.

The due date is Tuesday, **April 18th, 11:59 PM**. The penalty is 10% for each day of delay, and the final day of submission is Sunday, April 23rd at 11:59 PM.

Problem Specification

In this lab/assignment, you use a mechanism of inheritance to design and implement a class. The activities of this lab are very much related and similar to the tasks of the pre-lab. Therefore, a successful completing of the pre-lab is essential for this lab.

Individual tasks:

1. based on BankAccount class from the TUTORIAL create a new class saveBankAccount with additional three members:

```
double interestRate,  
int noWithDraws,  
int MAXnoWithDraws,
```

and a constructor that accepts:

```
name, account_number, balance, interestRate, and  
MAXnoWithDraws, and zeros noWithDraws
```

2. a new version of the method `printSummary()` that allows to print also (besides `name`, `account_number`, `balance`) the values of `interestRate`, `noWithdraws`, `MAXnoWithdraws`
3. in the main program create an object:
 `tomAcc` as an instance of `saveBankAccount` with: `name:Tom`,
 `account_number:234567`, `balance:3000`, `interestRate:0.05`,
 `MAXnoWithdraws:1`
 display its content using `printSummary()`
4. create two new methods for the class `saveBankAccount`:
 `double calInterest()`
 it calculates interest and returns the calculated value, in double
 `void resetWithdraws()`
 it resets (sets to 0) the member/field `noWithdraws`
and a new version of the method
 `double withdraw(double)`
 it checks and updates `noWithdraws`, checks if the operation can take place, takes the amount to withdraw as double, returns actual amount of withdraw in double
5. in the main program, perform the following operation on the object `tomAcc` (created in point 3)
 withdraw 500 from Tom's account
 withdraw 500 from Tom's account one more time
 display balance of Tom's account
 reset `MAXnoWithdraws` of Tom's account
 withdraw 500 from Tom's account one more time
 display balance of Tom's account

Marking Scheme

This assignment is worth 6% of your final mark. A total number of points you can obtain is 100. The marking of the lab is done according to the following schema:

TASK	POINTS
Pre-lab	
Subtotal	/15 points
Building an inherited class with additional methods and a constructor	/25
Modifications of the method <code>printSummary()</code>	/20
Writing new methods	/25
Writing the main program and usage of the methods	/15
Subtotal	/85 points
Total	/100 points