

## Lab exercises – 26.4.22

### INHERITANCE

1. Create an abstract class called **Account** that has datamembers: **accno(int)**, **accname(String)** and **balance(double)**. The member methods are: parameterized constructor and **toString** method. abstract methods : **void deposit (double amt)** and **double withdraw (double amt)** (5)
2. Derive two classes from class **Account**: **SavingsAccount** and **CheckingsAccount**. The members of **SavingsAccount** are **noofTransactions(int)**, parameterized constructor, overridden methods **toString()**, **deposit(double amt)** that increments balance with amt, **withdraw(double amt)** that decrements the balance by amt and **noofTransactions** is incremented by 1 inside **deposit()** and **withdraw()**. The members of **CheckingAccount** are parameterized constructor, overridden methods **deposit(double amt)** that increments balance with amt, **withdraw(double amt)** that decrements the balance by amt only if the balance is above 1000 after decrementation and **toString()**. (5)
3. Define **TestAccount** that instantiates objects of **SavingsAccount** and **CheckingsAccount**. The methods of the derived class are tested. Check the **SavingsAccount** object is an instance of class **Account**. (5)

## Spot Programs

1. Define an Abstract class called Time that has protected data fields: seconds, minutes and hour of type integer. Time should have get methods and constructors (default, three arguments), display() that prints the instance data fields. Derive two classes from class Time : TwentyFrHrClock and TwelveHrClock. Override the display function in the derived classes to print the respective instance as 24-hr clock display and 12-hr clock display.

Provide the following instance method to class TwentyFrHrClock:

timeelapsed(int) method that takes the number of seconds of elapsed and the instance invoking method should add the seconds to its seconds data field. If the seconds exceed 60, the minute should be incremented and subsequently the hour has to be incremented if exceeds 60 minutes.

Provide the following instance method to class TwelveHrClock: int difference(Time): that returns the number of seconds which is the difference between the two Time instances.

Write a Test program that demonstrates the functionalities of all the classes.

2. Write an abstract class called Person whose protected data fields are: name(String), age(int), height(double) and weight(double). The methods are: constructor with four arguments, get methods and toString() to display the details of Person.

Derive class called FootballPlayer and Cricketer. FootballPlayer with data fields: teamname(String), uniformnumber(int) and numberofgoals(int). Provide the following methods : constructor, int getnogoals() that returns the number of goals obtained by the player and override toString() that displays FootballPlayer details.

Cricketer will have data fields: countriname(String), role(String) which indicates the role played by the person as batsman, bowler, all-rounder, and wicket-keeper, nowickets(int) and noruns(int). The methods are: constructor, get methods and overridden toString() that displays the details of Cricketer. Write a test application to invoke the functionalities of the each class