



## ROBOTICS – Python Development – Lab 8 - Homework

1. Considering the following class specifications:

- **Account** - an abstract class which models a customer account. It should have the identifier and balance attributes along with deposit, withdraw and current\_balance methods (at least deposit and withdraw should be abstract methods);
- **StandardAccount** - provides standard implementation to the deposit and withdraw methods (they just add or remove the specified amount to or from the account's balance). Withdrawals that lead to a negative amount are not allowed;
- **OverdraftAccount** - provides implementation to the deposit and withdraw methods. The class has two additional parameters: negative\_balance\_limit representing the limit of negative balance withdrawals and overdraft\_penalty which is a percentage value. In case of withdrawals, when negative balance withdrawals are happening, the overdraft\_penalty is applied on top of the negative balance generated. The withdrawal, including the penalty applied, cannot go below the negative\_balance\_limit value.

Please perform the following:

- Implement the classes described by this specification, prioritizing the good usage of inheritance and polymorphism;
- Implement a functional flow to demonstrate the polymorphic functionality for withdraw method in case of StandardAccount and OverdraftAccount.

For example in case of overdraft account with the following configuration:

*Initial Balance = 50 RON*

*Overdraft Penalty = 10%*

*Negative Balance Limit = -100.*

the results of the operations would be:

**Withdrawing 100 RON:**

*Current Balance: 50*

*Negative amount generated:  $50 - 100 = -50$*

*Overdraft penalty applied:  $-50 * 0.1 = -5$*

*New Balance:  $100 - 50 - 5 = -55$*

*It is above negative balance limit – operation permitted.*

**Withdrawing 10 RON:**

*Current Balance: -55*

*Negative amount generated: -10*

*Overdraft penalty applied:  $-10 * 0.1 = -1$*

*New Balance =  $-55 - 10 - 1 = -66$*

*It is above negative balance limit – operation permitted.*

**Withdrawing 50 RON:**

*Current Balance: -66*

*Negative amount generated: -50*

*Overdraft penalty applied:  $-50 * 0.1 = -5$*

*New Balance =  $-66 - 50 - 5 = -121$*

*It is below negative balance limit – operation denied.*

*New Balance remains -66*