UNIVERSITÉ DU LUXEMBOURG

Programming 1

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Lab 8 – Inheritance, Polymorphism

2024–11–07

Snoop Dogg © *Epic Games*

Exercise 1 – Drop It Like It's Hot #Inheritance #Polymorphism

In the video game Fortnite, the **Player** can buy and equip different **Items** from the shop:

- The **Player** has an amount of *vBucks*, an *outfit* and a *back-bling*.
- Each **Item** has a *name*.
- Each **Item** has a *vBucks* price.
- **Item** has a method **equip(Player player)**, which will equip the **Item** in the appropriate slot of the **Player**.
- An **ItemBundle** contains multiple **Items**, though it too has the same **equip(...)** method.
- **Player** has a **buy(Item item)** method:
  - If the **Player** has sufficient *vBucks* to purchase the **Item**, the cost is subtracted and the method returns true.
  - Otherwise, the method returns false.

Model the necessary custom classes to represent this item shop and the player's interactions with items, then test your implementation with some sample main method. Include descriptive console messages for each method, as well as appropriate toString() implementations.

Exercise 2 – Bank Accounts

A normal bank account has an attribute `balance` and 2 methods `deposit` and `withdraw`. One can not withdraw more money than the account contains. An overdraft account has an additional attribute `allowedOverdraft` which represents the limit below zero that the balance of the account is allowed to reach, meaning that the balance of an overdraft account can go below zero when withdrawing money but not more than the allowed overdraft.

Design and implement a corresponding class hierarchy.