Industrial Software Development (ISDe) – January 18, 2021

Name: .... Surname: .... Student ID: ....

Exercise 3 (5 points) - 15 mins

Rewrite the code below by implementing a separate **Publisher** class. Use 'composition' to redesign the **PiggyBank** class, and check that the main program still works correctly.

```python
class Observer:
    def __init__(self, name):
        self.name = name

    def below_threshold(self, value):
        print("\nmessage from ", self.name)
        print("the amount is too low – it is only", value)


class PiggyBank:
    def __init__(self, initial_amount, lower_threshold):
        self.subscribers = set()
        self.amount = initial_amount
        self.lower_threshold = lower_threshold

    def register(self, an_observer):
        self.subscribers.add(an_observer)

    def unregister(self, an_observer):
        self.subscribers.discard(an_observer)

    def dispatch(self):
        for subscriber in self.subscribers:
            subscriber.below_threshold(self.amount)

    def save(self, value):
        self.amount += value

    def retrieve(self, value):
        possible_withdraw = self.amount >= value
        if possible_withdraw:
            self.amount -= value
            if self.amount < self.lower_threshold:
                self.dispatch()
        return possible_withdraw


# MAIN
piggy_bank = PiggyBank(initial_amount=40, lower_threshold=20)

obs1 = Observer('Observer 1')
obs2 = Observer('Observer 2')
piggy_bank.register(obs1)
piggy_bank.register(obs2)

piggy_bank.retrieve(15)
piggy_bank.retrieve(15)
piggy_bank.unregister(obs2)
piggy_bank.retrieve(5)
```