# Objects

# Announcements

# Class Statements

# Classes

A class describes the behavior of its instances

**Idea:** All bank accounts have a balance and an account holder; the Account class should add those attributes to each newly created instance

**Idea:** All bank accounts share a withdraw method and a deposit method

```
>>> a = Account('John')
>>> a.holder
'John'
>>> a.balance
0
```

balance and holder are ***attributes***

```
>>> a.deposit(15)
15
>>> a.withdraw(10)
5
>>> a.balance
5
>>> a.withdraw(10)
'Insufficient funds'
```

deposit and withdraw are ***methods***

# The Account Class

```
class Account:
```

__init__ is a special method name for the function that constructs an Account instance

```
    def __init__(self, account_holder):
        self.balance = 0
        self.holder = account_holder
```

self is the instance of the Account class on which deposit was invoked: a.deposit(10)

```
    def deposit(self, amount):
        self.balance = self.balance + amount
        return self.balance
    def withdraw(self, amount):
        if amount > self.balance:
            return 'Insufficient funds'
        self.balance = self.balance - amount
        return self.balance
```

Methods are functions defined in a class statement

(Demo)

```
>>> a = Account('John')
>>> a.holder
'John'
>>> a.balance
0
>>> a.deposit(15)
15
>>> a.withdraw(10)
5
>>> a.balance
5
>>> a.withdraw(10)
'Insufficient funds'
```

# Discussion Question: Create Many Accounts

Write a function **create** that takes a list of strings called **names.** It returns a dictionary in which each name is a key, and its value is a new **Account** with that name as the **holder.** Deposit $5 in each account before returning.

```
def create(names: list[str]) -> dict[str, Account]:
    """Creates a dictionary of accounts, each with an initial deposit of 5.

    >>> accounts = create(['Alice', 'Bob', 'Charlie'])
    >>> accounts['Alice'].holder
    'Alice'
    >>> accounts['Bob'].balance
    5
    >>> accounts['Charlie'].deposit(10)
    15
    """
    result = { name: Account(name) for name in names }
    for a in result.values():
        a.deposit(5)
    return result
```

dictionary

An Account instance

Make all of the accounts

Deposit 5

# Animation Demos by Hany Farid