

# Objects

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# 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
```

```
>>> 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'
```

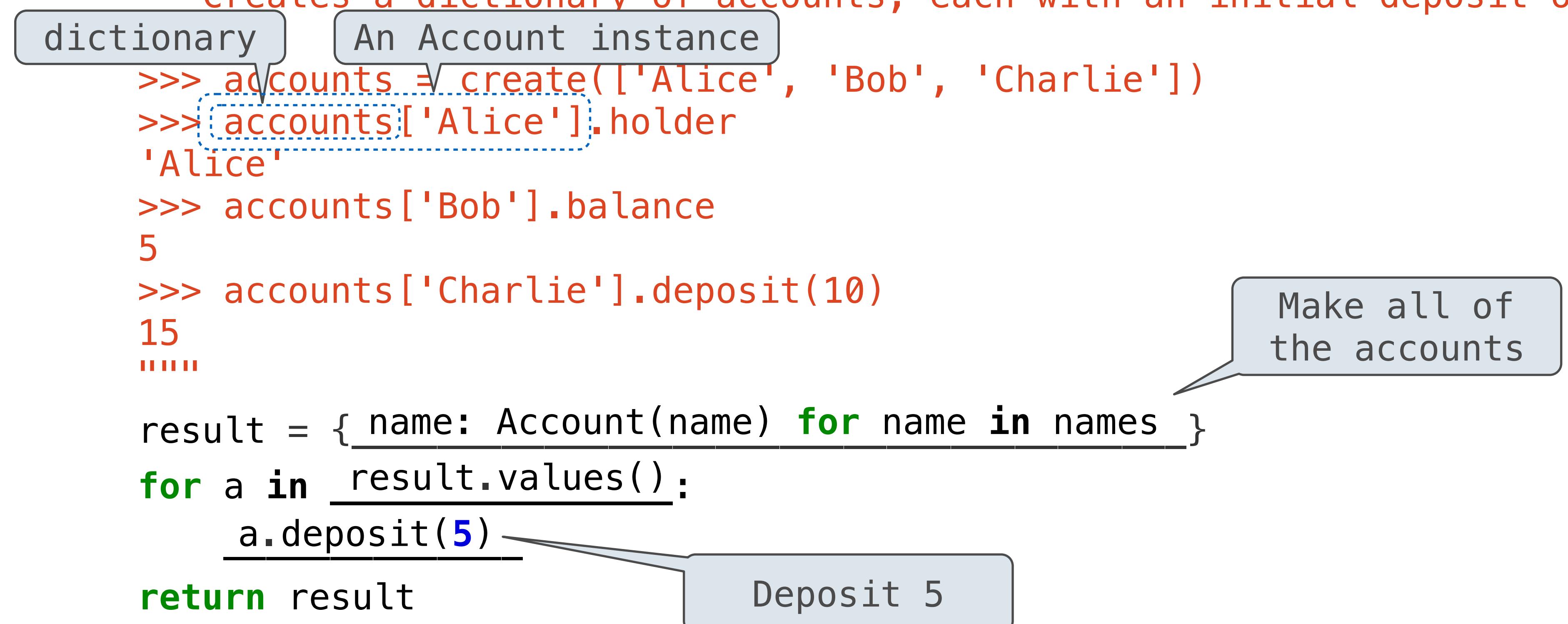
Methods are functions defined in a class statement

(Demo)

## 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.  
    dictionary      An Account instance  
    >>> 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
```



Animation Demos by Hany Farid