

Εργαστήριο 8

Εισαγωγή στον Προγραμματισμό Υπολογιστών

Περιεχόμενα

1. Τάξεις και αντικείμενα
2. Παράδειγμα: ηλεκτρονικό κατάστημα

Τάξεις και αντικείμενα

```
>>> class Character:  
    """GRAPSTE TON KWDIKA SAS EDW."""
```

```
>>> tommy = Character('Tommy')  
>>> tommy.name  
'Tommy'  
>>> mark = Character('Mark')  
>>> tommy.talk(mark)  
'Tommy: "Oh, hi Mark."'   
>>> mark.talk(tommy)  
'Mark: "Oh, hi Tommy."'   
>>> tommy.order  
1  
>>> mark.order  
2
```

Τάξεις και αντικείμενα

```
>>> class Character:
    """GRAPSTE TON KWDIKA SAS EDW."""
    n = 0
    def __init__(self, name):
        self.name = name
        Character.n = Character.n + 1
        self.order = Character.n
    def talk(self, s):
        return '{0}: "Oh, hi {1}."' \
            .format(self.name, \
                    s.name)
```

```
>>> tommy = Character('Tommy')
>>> tommy.name
'Tommy'
>>> mark = Character('Mark')
>>> tommy.talk(mark)
'Tommy: "Oh, hi Mark."'
>>> mark.talk(tommy)
'Mark: "Oh, hi Tommy."'
>>> tommy.order
1
>>> mark.order
2
```

Τάξεις και αντικείμενα

```
>>> class DramaticCharacter(Character):
```

```
    _____  
    _____  
    _____
```

```
>>> tommy = DramaticCharacter('Tommy')
```

```
>>> lisa = Character('Lisa')
```

```
>>> tommy.name
```

```
'Tommy'
```

```
>>> tommy.talk(lisa)
```

```
'Tommy: "Oh, hi Lisa."'
```

```
>>> tommy.drama(lisa)
```

```
'Tommy: "You\'re tearing me apart, Lisa!"'
```

Τάξεις και αντικείμενα

```
>>> class DramaticCharacter(Character):
    def drama(self, s):
        return '{0}: "You\'re tearing me apart, {1}" \
               .format(self.name, s.name)

>>> tommy = DramaticCharacter('Tommy')
>>> lisa = Character('Lisa')
>>> tommy.name
'Tommy'
>>> tommy.talk(lisa)
'Tommy: "Oh, hi Lisa."'
>>> tommy.drama(lisa)
'Tommy: "You\'re tearing me apart, Lisa!"'
```

Τάξεις και αντικείμενα

```
>>> def print_cast(cast):
```

```
>>> Character.n = 0
```

```
>>> tommy = DramaticCharacter('Tommy')
```

```
>>> lisa = Character('Lisa')
```

```
>>> mark = Character('Mark')
```

```
>>> cast = [mark, lisa, tommy]
```

```
>>> print_cast(cast)
```

```
Cast (in the order of appearance):
```

```
Tommy
```

```
Lisa
```

```
Mark
```

Τάξεις και αντικείμενα

```
>>> def print_cast(cast):  
    for character in sorted(cast, key = lambda x: x.order):  
        print(character.name)
```

```
>>> Character.n = 0
```

```
>>> tommy = DramaticCharacter('Tommy')
```

```
>>> lisa = Character('Lisa')
```

```
>>> mark = Character('Mark')
```

```
>>> cast = [mark, lisa, tommy]
```

```
>>> print_cast(cast)
```

```
Cast (in the order of appearance):
```

```
Tommy
```

```
Lisa
```

```
Mark
```


Παράδειγμα: ηλεκτρονικό κατάσταση

Παράδειγμα: ηλεκτρονικό κατάστημα

- Αντικείμενα της τάξης `Item` του module [estore.py](#) αναπαριστούν προϊόντα ενός ηλεκτρονικού καταστήματος

```
class Item:
    def __init__(self, title, price = 0):
        self.title = title
        self.price = price
        self.copies = 1
    def __str__(self):
        return 'Title: {0}\nCopies: {1}\nPrice: {2}' \
                .format(self.title, self.price, self.copies)
    def __mul__(self, n):
        self.copies = n
        return self
    def __rmul__(self, n):
        return self.__mul__(n)
```

Παράδειγμα: ηλεκτρονικό κατάστημα

- Αντικείμενα της τάξης `Book` αναπαριστούν βιβλία
 - Ιδιότητες: λίστα συγγραφέων, ISBN (κωδικός βιβλίων), περιγραφή

```
>>> karamazov = Book('The Brothers Karamazov', ['Fyodor Dostoevsky'], \
                    88938337, 'great novel!', 12.99)
```

```
>>> print(karamazov)
```

```
Title: The Brothers Karamazov
```

```
Price: 12.99
```

```
Copies: 1
```

```
Author(s): Fyodor Dostoevsky
```

```
ISBN: 88938337
```

```
Description:great novel!
```

Παράδειγμα: ηλεκτρονικό κατάστημα

- Εισάγετε τον ορισμό της τάξης `Book` στο module `estore.py`

```
class Book(Item):
```

```
    """GRAPSTE TON KWDIKA SAS EDW."""
```

Παράδειγμα: ηλεκτρονικό κατάστημα

- Εισάγετε τον ορισμό της τάξης `Book` στο module `estore.py`

```
class Book(Item):  
    """GRAPSTE TON KWDIKA SAS EDW."""  
    def __init__(self, title, authors, isbn, description = '', price = 0):  
        Item.__init__(self, title, price)  
        self.authors = authors  
        self.isbn = isbn  
        self.description = description  
    def __str__(self):  
        return Item.__str__(self) + \  
            '\nAuthor(s): {0}\nISBN: {1}\nDescription:{2}'\  
            .format(', '.join(self.authors), self.isbn, self.description)
```

Παράδειγμα: ηλεκτρονικό κατάστημα

- Αντικείμενα της τάξης `Music` αναπαριστούν μουσικά άλμπουμ
 - Ιδιότητες: λίστα καλλιτεχνών, είδος

```
>>> thewall = Music('The Wall', ['Pink Floyd'], 'rock', 6.99)
```

```
>>> print(thewall)
```

```
Title: The Wall
```

```
Price: 6.99
```

```
Copies: 1
```

```
Artist(s): The Pink Floyd
```

```
Category: rock
```

Παράδειγμα: ηλεκτρονικό κατάστημα

- Εισάγετε τον ορισμό της τάξης `Music` στο module `estore.py`

```
class Music(Item):
```

```
    """GRAPSTE TON KWDIKA SAS EDW."""
```

Παράδειγμα: ηλεκτρονικό κατάστημα

- Εισάγετε τον ορισμό της τάξης `Music` στο module `estore.py`

```
class Music(Item):  
    """GRAPSTE TON KWDIKA SAS EDW."""  
    def __init__(self, title, artists, category, price = 0):  
        Item.__init__(self, title, price)  
        self.artists = artists  
        self.category = category  
    def __str__(self):  
        return Item.__str__(self) + '\nArtist(s): {0}\nCategory: {1}' \\  
            .format(', '.join(self.artists), self.category)
```


Παράδειγμα: ηλεκτρονικό κατάστημα

```
>>> store = Store([2*Music('The Wall', ['The Pink Floyd'], 'rock', 6.99), \
                   3*Music('Kind of Blue', ['Miles Davis'], 'jazz', 5.99), \
                   Book('The Brothers Karamazov', ['Fyodor Dostoevsky'], \
                        88938337, 'great novel!', 12.99)])
```

```
>>> store.print_items()
```

```
ID: 0
```

```
Title: The Wall
```

```
Price: 6.99
```

```
Copies: 2
```

```
Artist(s): The Pink Floyd
```

```
Category: rock
```

```
ID: 1
```

```
Title: Kind of Blue
```

```
Price: 5.99
```

```
Copies: 3
```

```
Artist(s): Miles Davis
```

```
Category: jazz
```

```
ID: 2
```

```
Title: The Brothers Karamazov
```

```
Price: great novel!
```

```
Copies: 1
```

```
Author(s): Fyodor Dostoevsky
```

```
ISBN: 88938337
```

```
Description:12.99
```

Παράδειγμα: ηλεκτρονικό κατάστημα

```
>>> store.sell([0, 1]) # list of sold ids
ID: 0
Title: The Wall
Price: 6.99
Copies: 1
Artist(s): The Pink Floyd
Category: rock
ID: 1
Title: Kind of Blue
Price: 5.99
Copies: 2
Artist(s): Miles Davis
Category: jazz
ID: 2
Title: The Brothers Karamazov
Price: great novel!
Copies: 1
Author(s): Fyodor Dostoevsky
ISBN: 88938337
Description:12.99
```

Παράδειγμα: ηλεκτρονικό κατάστημα

```
>>> store.profit
```

```
12.98
```

```
>>> store.print_items('Floyd')
```

```
ID: 0
```

```
Title: The Wall
```

```
Price: 6.99
```

```
Copies: 1
```

```
Artist(s): The Pink Floyd
```

```
Category: rock
```

Παράδειγμα: ηλεκτρονικό κατάστημα

- Εισάγετε τον ορισμό της τάξης `Store` στο module `estore.py`

```
class Store:
```

```
    """GRAPSTE TON KWDIKA SAS EDW."""
```

```
    def __init__(self, items):
```

```
        self._items = dict(enumerate(list(items)))
```

```
        self.profit = 0
```

```
    def sell(self, basket_ids):
```

```
    def print_items(self, keyword = None):
```

Παράδειγμα: ηλεκτρονικό κατάστημα

- Εισάγετε τον ορισμό της τάξης `Store` στο module `estore.py`

```
class Store:
    """GRAPSTE TON KWDIKA SAS EDW."""
    def __init__(self, items):
        self._items = dict(enumerate(list(items)))
        self.profit = 0

    def sell(self, basket_ids):
        for id in basket_ids:
            item = self._items[id]
            item.copies = item.copies - 1
            if item.copies == 0:
                del self._items[id]
            self.profit = self.profit + item.price

    def print_items(self, keyword = None):
        for id, item in self._items.items():
            str_info = str(item)
            if keyword == None or keyword in str_info:
                print('ID: ' + str(id) + '\n' + str_info)
```