



B.Pharm Semester 1

PHARMACY | PEOPLE | A HEALTHIER TOMORROW

Science
Meets
Solutions

MEDICINES
DATA
IDEAS
BETTER HEALTH

Basics of Python Programming for Pharmaceutical Sciences

Unit 3

Data Structures & File Handling

PPT Notes



Learn



Code



Explore

KNOWLEDGE TODAY
BETTER CARE TOMORROW

List
[1, 2, 3, ...]

Tuple
('A', 'B', ...)

Dictionary
{ 'key': 'value' }

```
1 # Working with data structures
2 students = ["Paracetamol", "Ibuprofen"]
3 doses = (500, 200)
4 drug_info = {"name": "Amoxicillin",
5              "form": "Capsule"}
6
7 # File handling
8 with open("data/drugs.csv", "r") as f:
9     for line in f:
10         print(line.strip())
```



LISTS, TUPLES, AND DICTIONARIES

List

A list is an ordered, mutable collection. It can contain different data types and repeated values.

```
numbers = [10, 20, 30, 40]
fruits = ["apple", "banana", "cherry"]
mixed = [10, "Python", 3.5, True]
```

- Use square brackets [] and commas between items.
- Ordered: each item has a position.
- Mutable: items can be changed after creation.
- Duplicates are allowed.

```
print(numbers[0])
numbers[1] = 25
print(numbers)
```

Output:

```
10
[10, 25, 30, 40]
```

Use a list when data may need updating, such as a changing collection of measurements.

LISTS, TUPLES, AND DICTIONARIES

Tuple

A tuple is an ordered collection whose stored items cannot be reassigned after creation.

```
numbers = (10, 20, 30, 40)
fruits = ("apple", "banana", "cherry")
print(numbers[0])
```

Output: 10

- Tuple items may have different types. Duplicates are allowed.
- Commas form a tuple. Parentheses are the usual way to write it.

```
single = (10,)
```

The comma is needed for a one-item tuple.

- Tuples are useful for a fixed group of values.
- Trying `numbers[0] = 99` raises `TypeError`.
- Tuple performance depends on the operation. Do not assume every tuple operation is faster than a list operation.

LISTS, TUPLES, AND DICTIONARIES

Dictionary and Comparison

- A dictionary stores key-value pairs. Each key identifies a value.

```
student = {  
    "name": "Alice",  
    "age": 20,  
    "marks": 85  
}  
print(student["name"])
```

Output:

Alice

- Use braces { } and a colon between each key and value.
- Keys are unique. Values may repeat.
- A dictionary is mutable and preserves insertion order in modern Python.

Comparison:

Data Type	Syntax	Key Features	Access Method
List	[]	ordered items, mutable	index access
Tuple	()	ordered items, immutable	index access
Dictionary	{key: value}	mutable	key access

Use in Pharmacy

- A dictionary is useful for named fields such as patient ID, age and medicine name.

```
patient = {  
    "id": "P001",  
    "age": 45,  
    "medicine": "Paracetamol"  
}
```

← Stores information about a patient using named fields.

INDEXING AND SLICING LISTS

Indexing

Indexing selects one item from an ordered sequence.

Python code

```
numbers = [10, 20, 30, 40, 50]
print(numbers[0])
print(numbers[2])
print(numbers[-1])
print(numbers[-2])
```

Output

```
10
30
50
40
```

List with indexes

10	20	30	40	50
----	----	----	----	----

Positive index:	0	1	2	3	4
Negative index:	-5	-4	-3	-2	-1

- Positive indexing starts at 0.
- Negative indexing counts from the end.

Tuple and string examples

Python code

```
values = (10, 20, 30)
text = "Python"
print(values[1])
print(text[0])
```

Output

```
20
P
```

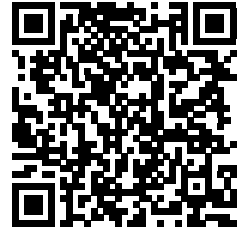


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