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Chapter 13 - Advanced Python 2

Virtual Environment

An environment which is same as the System interpretor but is isolated from the other python environments on the system.

Installation

To use virtual environments, we write

```
pip install virtualenv → Install the package
```

We create a new environment using:

```
virtualenv myprojectenv → Creates a new venv
```

The next step after creating the virtual environment is to activate it.
We can now use this virtual environment as a separate python installation.

pip freeze command

pip freeze returns all the packages installed in a given python environment along with the versions

```
" pip freeze > requirements.txt "
```

The above command creats a file named requirements.txt in the same directory containing the output of pip freeze.
We can distribute this file to other users and they can recreate the same environment using:

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```
pip install -r requirements.txt
```

Lambda functions

functions created using an expression using lambda keyword

Syntax:

```
lambda arguments : expressions
```

↳ can be used as a normal function

Example:

```
Square = lambda x : x*x
Square(6)   → returns 36

Sum = lambda a,b,c : a+b+c
Sum(1,2,3)  → returns 6
```

.join method (strings)

creates a string from iterable objects

```
l = ["apple", "mango", "banana"]

",and,".join(l)
```

The above line will return "apple,and,mango,and,banana"

format method (strings)

formats the values inside the string into a desired output

```
template.format(p1, p2 ...)
```

↳ arguments

Syntax for format looks like:

"{} is a good {}".format("Harry", "boy") —①

"{1} is a good {0}".format("Harry", "boy") —②

Output for ①
Harry is a good boy

Output for ②
boy is a good Harry

Map, Filter & Reduce
Map applies a function to all the items in an input_list

Syntax:

map(function, input_list)
↳ Can be lambda function

Filter creates a list of items for which the function returns true.

list(filter(function))
↳ Can be a lambda function

Reduce applies a rolling computation to sequential pair of elements

```
from functools import reduce
val = reduce(function, list1)
```
↳ Can be a lambda function

If the function computes sum of two numbers and the

list is [1, 2, 3, 4]

1 2 3 4

3 3 4

6 4

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=> Sequential Computation

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Chapter 13 - Practice Set

1. Create two virtual environments, install few packages in the first one. How do you create a similar environment in the second one?

2. Write a program to input name, marks and phone number of a student and format it using the format function like below:

"The name of the student is Harry, his marks are 72 and phone number is 99999888"

3. A list contains the multiplication table of 7. Write a program to convert it to a vertical string of same numbers (7 / 14 / ⋮)

4. Write a program to filter a list of numbers which are divisible by 5

5. Write a program to find the maximum of the numbers in a list using the reduce function.

6. Run pip freeze for the system interpreter. Take the contents and create a similar virtualenv.

7. Explore the Flask module and create a web server using Flask & Python.

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Project 3 - Student Library

Implement a student library system using OOPs where students can borrow a book from the list of books.
Create a separate Library and Student class.
Your program must be menu driven.
You are free to choose methods and attributes of your choice to implement this functionality.