Splufic Python Training

Welcome to the instructor-led Training for week three day one

Topics Covered

- Writing/Documenting a Python program
- conditional statements
  - 1-way, 2-way, multi-way
  - Nesting
- Python standard Library
- Iteration through sequence objects
- User Defined Functions

Writing/Documenting a Python program

- We have worked in the interactive mode
- To write python scripts/code, it has to be saved in a file with **.py** as the extension
- This file forms the basis of **Python Modules**
- A module is simply a file containing Python code. Every file containing Python code and whose file name ends in .py is a Python module. The file hello.py we created is a
  - **Built-in Modules**
  - **User defined modules**

Python standard Library

- Python programming language comes with a standard library that includes
  - **functions** such as max(), sum(), random() and
  - **classes** such as int, str, and list.

Python standard Library (Cont'd)

- The Standard Library includes modules to support, among others:
  - • Network programming
  - • Web application programming
  - • Graphical user interface (GUI) development
  - • Database programming
  - • Mathematical functions
  - • Pseudorandom number generators
  - We will eventually use all of these modules. Right now we will see how to use the math and
  - fraction modules.

Math Module

Function	Explanation
`sqrt(x)`	$\sqrt{x}$
`ceil(x)`	$\lceil x \rceil$ (i.e., the smallest integer $\geq x$)
`floor(x)`	$\lfloor x \rfloor$ (i.e., the largest integer $\leq x$)
`cos(x)`	$\cos(x)$
`sin(x)`	$\sin(x)$
`log(x, base)`	$\log_{base}(x)$
`pi`	3.141592653589793
`e`	2.718281828459045

For more info, visit: **https://docs.python.org/3/**

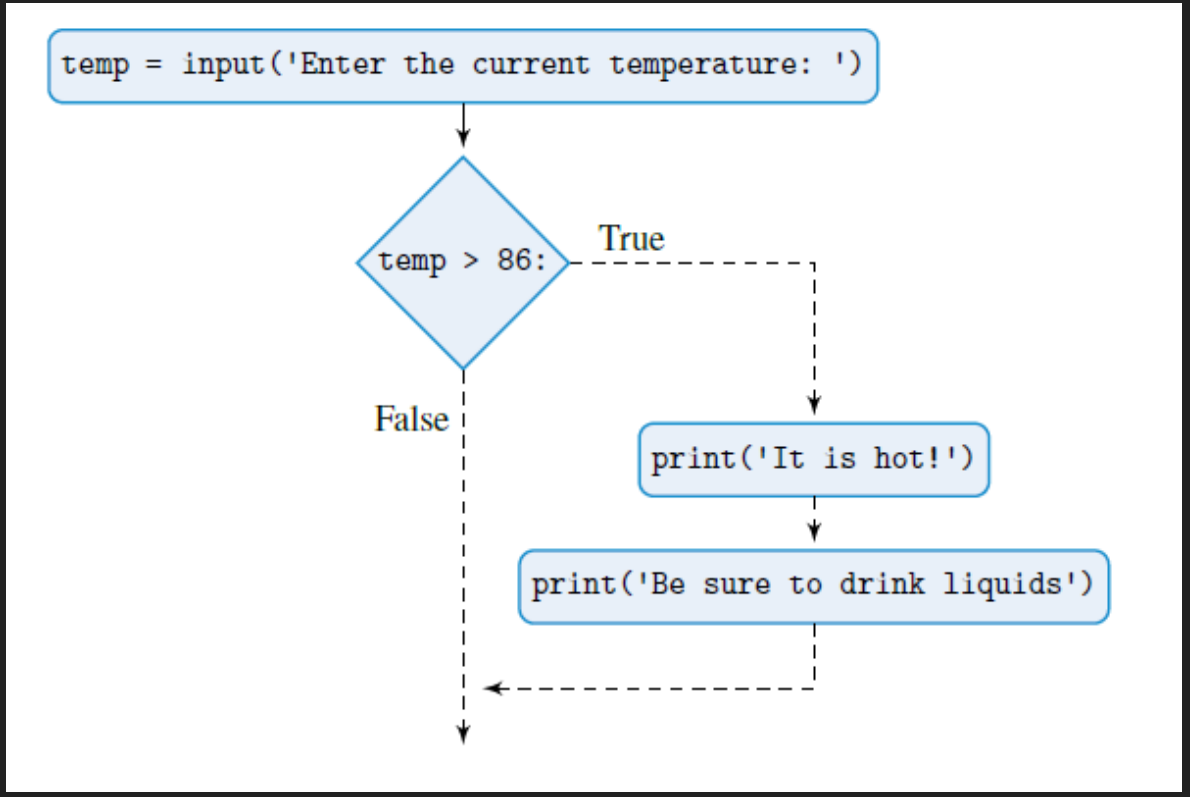
Conditional Statements

- Every python programs executes line by line
- We can **control** which statements are executed and which statements should be executed repeatedly.
- Conditional statements are used in control structures
- Single selection - 1-way
  - **If**
- Double selection - 2-way
  - **If/else**
- Multiple selection - multi-way
  - **If ..... if/else**

Structures that determines the flow of your program

Single Selection

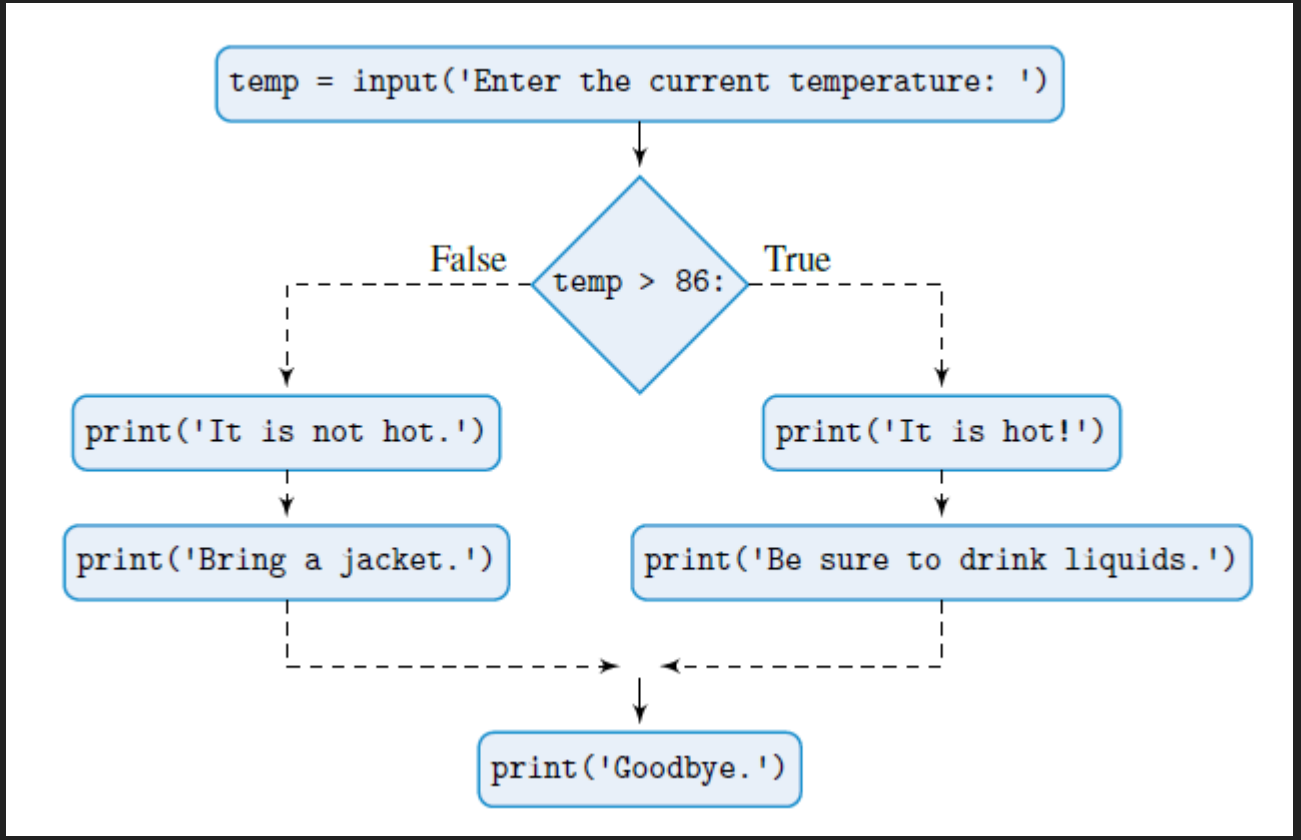
Example flowchart:



Mainly used to make One-Way Decisions

Double Selection

Example flowchart:



Mainly used to make Two-Way Decisions

Iteration through sequence objects

- Iteration is the process of repeating a particular operation or task a number of times
- We can iterate through lists and strings
- The Python **for** loop statement can be

Class Work 1

Translate these into Python if/else statements:

(a) If year is divisible by 4, print 'Could be a leap year.'; otherwise print 'Definitely not a leap year.'

(b) If list ticket is equal to list lottery, print 'You won!'; else print 'Better luck next time...'

Class Work 2

Implement a program that requests the current temperature in degrees Fahrenheit from the user and prints the temperature in degrees Celsius using the formula

$$\texttt{celsius} = \frac{5}{9}(\texttt{fahrenheit} - 32)$$

Your program should execute as follows:

>>>

Enter the temperature in degrees Fahrenheit: 50

The temperature in degrees Celsius is 10.0

Class Work 3

Implement a program that starts by asking the user to enter a login id (i.e., a string).

The program then checks whether the id entered by the user is in the list ['joe', 'sue', 'hani', 'sophie'] of valid users.

Depending on the outcome, an appropriate message should be printed. Regardless of the outcome, your function should print 'Done.' before terminating.

Here is an example of a successful login:

>>>

Login: joe

You are in!

Done.

And here is one that is not:

>>>

Login: john

User unknown.

Done.

Questions?