



python™

Lecture 4

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Strings, `if/else`, `return`, user input

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Strings

index	0	1	2	3	4	5	6	7
<i>or</i>	-8	-7	-6	-5	-4	-3	-2	-1
character	P	.		D	i	d	d	y

- Accessing character(s):
variable [**index**]
variable [**index1:index2**]
 - **index2** is exclusive
 - **index1** or **index2** can be omitted (end of string)

```
>>> name = "P. Diddy"  
>>> name[0]  
'P'  
>>> name[7]  
'y'  
>>> name[-1]  
'y'  
>>> name[3:6]  
'Did'  
>>> name[3:]  
'Diddy'  
>>> name[:-2]  
'P. Did'
```

String Methods

Python
<code>len(str)</code>
<code>startswith, endswith</code>
<code>upper, lower,</code> <code>isupper, islower,</code> <code>capitalize, swapcase</code>
<code>find</code>
<code>strip</code>

```
>>> name = "Jordan Hiroshi Nakamura"  
>>> name.upper()  
'JORDAN HIROSHI NAKAMURA'  
>>> name.lower().startswith("jordan")  
True  
>>> len(name)  
23
```

for Loops and Strings

- A `for` loop can examine each character in a string in order.

```
for name in string:  
    statements
```

```
>>> for c in "booyah":  
...     print(c)  
...  
b  
o  
o  
y  
a  
h
```

input

`input` : Reads a string from the user's keyboard.

- reads and returns an entire line of input

```
>>> name = input("Howdy. What's yer name? ")
Howdy. What's yer name? Paris Hilton

>>> name
'Paris Hilton'
```

input for numbers

- to read a number, cast the result of `input` to an `int` or `float` (real number)
 - Only numbers can be cast as `ints`!
 - Example:

```
age = int(input("How old are you? "))
print("Your age is", age)
print("You have", 65 - age, "years until
retirement")
```

Output:

```
How old are you? 53
Your age is 53
You have 12 years until retirement
```

if

`if` **condition:**
statements

– Example:

```
gpa = float(input("What is your GPA? "))  
if gpa > 2.0:  
    print("Your application is accepted.")
```

if/else

```
if condition:  
    statements  
elif condition:  
    statements  
else:  
    statements
```

– Example:

```
gpa = float(input("What is your GPA? "))  
if gpa > 3.5:  
    print("You have qualified for the honor roll.")  
elif gpa > 2.0:  
    print("Welcome to Mars University!")  
else:  
    print("Your application is denied.")
```


Logical Data Type

- Logic data value: True or False

```
>>>3>2
```

```
>>>3<=2
```

- Logic operator: and, or, not

```
>>>(3>2) and (2<4)
```

```
>>>(3>2) or (2<4)
```

```
>>>(3>>2) or (2==4)
```

Logical Operators

Operator	Meaning	Example	Result
==	equals	1 + 1 == 2	True
!=	does not equal	3.2 != 2.5	True
<	less than	10 < 5	False
>	greater than	10 > 5	True
<=	less than or equal to	126 <= 100	False
>=	greater than or equal to	5.0 >= 5.0	True

Operator	Example	Result
and	(2 == 3) and (-1 < 5)	False
or	(2 == 3) or (-1 < 5)	True
not	not (2 == 3)	True

if ... in

if value in sequence:
statements

- The sequence can be a range, string, tuple, or list
- Examples:

```
x = 3
```

```
if x in range(0, 10):  
    print("x is between 0 and 9")
```

```
name = input("What is your name? ")  
name = name.lower()
```

```
if name[0] in "aeiou":  
    print("Your name starts with a vowel!")
```

Exercise 1

- Please write a Python program
 1. Input your age on the keyboard
 2. If the age ≥ 10 and age < 18 , then print “Best year, you are a teenager” ,
 - If the age < 10 , then print “Sorry, please grow up fast”
 - If the age ≥ 18 , then print “Great, you are an adult now!”

Exerise 2

- Please write a Python program to find the roots of a quadratic equation $f(x) = ax^2+bx+c$
 1. Please input three coefficients a, b, c from your keyboard
 2. If there are no real roots, please print “Sorry, no real roots” (a=1,b=2,c=3)
 3. If there are two different real roots, please print
root1 = 2
root2 = 3 (a=1,b=-5, c=6)
 4. If there are two same real roots, please print
These two roots are the same = 1 (a=1, b= -2, c=1)

Hint: You need to use math package for sqrt() function

```
from math import *
```



Exercise 3

- Please write a Python program to count the vowels (a,e,l,o,u) from the strings input from the keyboard

for example, input string "abcdef"

Output: The number of vowels is: 1

- Hint: 1. Use (for xx in "aeiou") to check if a letter is a vowel
2. use (for x in str1) to loop through the input string

Exercise

- Write a program that reads two employees' hours and display each's total and the overall total.
 - Cap each day at 8 hours
- Employee 1: How many days? 3
Hours? 6
Hours? 12
Hours? 5
Employee 1's total hours = 19 (6.33 / day)
- Employee 2: How many days? 2
Hours? 11
Hours? 6
Employee 2's total hours = 14 (7.00 / day)
- Total hours for both = 33