

16 Aug '24

(1) PyCharm - application - to do Python
(community edition)
- Editor, File tree, Output, Console } programming

(2) Book : Learning Programming with Python 3.

(3) Basic expressions - integers, floats, strings, datatypes

HW: Finish last class HW

- 3 expressions file also

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[illegible]

Expressions — simple calculations

→ 3+4+5 (int)

→ 42.6 + 53.2 (float)

→ $43 + 53.2$ (float - int is converted to float)

→ 'this' + 'is' (string)

$$\rightarrow '3+4=' + \text{str}(3+4)$$

```
>>> type(32)
```

→ int

```
>>> type(23.4)
```

→ float

```
type ('vaptx')
```

→ 5th

```
>>> type("vaptx")
```

→ 5th

```

>>> type(vortex)

```

→ error
(no quotes)

Operators :

$+$ \rightarrow addition $3+4 = 7$

$-$ \rightarrow subtraction $10-4 = 6$

$*$ \rightarrow multiplication $20*4 = 80$
(asterisk)

$/$ \rightarrow division $20/4 = 5$
(slash)

$$21/4 = 5.25$$

$//$ \rightarrow int. division

$$21//4 = 5$$

(quotient)

$\%$ \rightarrow modulo

$$21\%4 = 1$$

(remainder)

$**$ \rightarrow power

$$4**6 = 4^6$$

$$= 4 \times 4 \times 4 \times 4 \times 4 \times 4$$

(6 times)

$$4*6 = 4 \times 6 = 4+4+4+4+4$$

$$4**6 = 4^6 = 4 \times 4 \times 4 \times 4 \times 4 \times 4$$

Empty space:

Same $\rightarrow 3+4, 3. + 4, 3 + 4$

Type casting:

$$\text{int} \rightarrow \text{float} : \underbrace{30}_{\text{int}} + \underbrace{42.3}_{\text{float}} = \underbrace{30.0}_{\text{float}} + \underbrace{42.3}_{\text{float}} = 72.3$$

$$\text{float} \rightarrow \text{int} : 30 + \text{int}(42.3) = 30 + 42 = 72$$

$$\begin{aligned} \text{int} \rightarrow \text{str} : & \underbrace{\text{"Result is"}}_{\text{str}} + \underbrace{\text{str}(\underbrace{42 * 63}_{\text{int}})}_{\text{str}} \\ &= \text{"Result is"} + \text{'2709'} \end{aligned}$$

$$\text{str} \rightarrow \text{int} : \text{int}(\text{'24'}) = 24 ; \text{int}(\text{'3c4k'}) \Rightarrow \text{error}$$

$$\text{str} \rightarrow \text{float} : \text{float}(\text{'24.3'}) = 24.3 ;$$

String operators:

$3 * 'Pig' = 'PigPigPig'$

$'Pig' + 'Car' = 'PigCar'$

HW: Ch 3 textbook

→ Create a program file

→ Type everything that is in boxes in the text book

→ Run

→ Play with operators, expressions, type casting

→ From Maths ch 3 HW +, -, *, / (10 for each)
do all of these in python and verify
(create a program called Math HW)

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Operator precedence (order) :

$$\underline{3 + 4 - 6 * 14 / 2 + 3 * (4 - 1)}$$

float (24)

(1) ,

$$\begin{array}{l} 4 + 4 / 2 \\ \hline = 8 / 2 \\ = 4 \end{array} \quad \times$$

(2)

$$\begin{array}{l} 4 + 4 / 2 \\ \hline = 4 + 2 \\ = 6 \end{array} \quad \checkmark$$

Maths

→ BODMAS

— Brackets, of, division, multiply, add, subtract

→ PEMDAS

— parantheses, exponential, multiplication,
() (power)

division, add, subtract

Python

Variables: A place where you store values.

You can give any name to a variable.

Ex: myVar = 43

→ myVar + 23
66

→ myVar * 2
86

x = < some value >

↓
assignment operator

HW: (1) Read all previous class notes
(2) Ch. 4 code type into a program file and run

Variable names

can not be
python keywords

— Eg: for, in,
true, false
etc.

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Ch.4 variables:

→ Can u name a variable as 'print'?

Yes. But after that, regular print function will not work

→ How to block comment?

select all the lines you want to comment
and press 'ctrl + /'

— same for uncommenting

→ HW: (1) Swapping examples practice - write ^{code}

→ Jim has 23.56 grams of tomatoes, while Tom has 43.641 grams of beans. They exchange their vegetables. Do this in python as shown in class example.

→ $x = \text{'expr'}$

↳ First this expression is computed

→ Then 'x' variable is assigned that computed value.

$x = 2 ;$

$y = \underline{x * 5 + 2} ;$ (Here 'x' is 2, 'y' is 12)

$x = \underline{x + y * 2}$

$2 + 12 * 2$

$2 + 24$

26

PEMDAS-

After this step, x is '26', y is '12'

$y = x - 12 ;$ $26 - 12$
 14

After this step, x is 26, y is '14'.

→ H.W.: After each of these steps, manually compute the values of all variables; Check in python also by printing the values.

$$x = 2 ; y = 3$$

$$(1) z = x^2 + y ;$$

$$(2) y = x - y ;$$

$$(3) x = z \times y + x - 14 ;$$

$$(4) z = y^2 - 15 ;$$

$$(5) x = x + y - z ;$$

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For Maths arithmetics - $+$, $-$, $/$, $*$,

we learnt how to verify

'==' operator - equality operator

`print('expr 1' == 'expr 2')`

print true if expr 1 and 2 are equal

else prints false

→ `sum = 23 + 42`

`print(sum - 23 == 42)`

→ `product = 23 * 42`

`print(product // 42 == 23)`

→ difference = 23 - 42

print (difference + 42 == 23)

→ quotient = 231 // 53 ; remainder = 231 % 53

print (quotient * 53 + remainder == 231)

HW: For previous maths arithmetics hw,
verify each answer like in
class example code.

Add, Multiplications

Verify in two ways

sum = a + b; sum - a == b
sum - b == a

product = a * b; product / a == b
product / b == a

- , ÷

only one way to verify

difference = a - b; difference + b == a

dividend // divisor = quotient ; quotient * divisor + remainder == dividend
dividend % divisor = remainder