

Fundamentals of Programming Python
chapter 3, section 10 Exercises with Answers
First Homework 2023/02/13

1. Is the literal 4 a valid python expression?

Answer: Yes, literal 4 is a valid python expression.

2. Is the variable x a valid python expression?

Answer: Yes, if the variable x exists, it is.

3. Is x + 4 a valid Python expression?

Answer: Yes, it is; but x should be defined.

4. What effect does the unary + operator have when applied to a numeric expression?

Answer: No effect all numeric values are positive by default.

5. Sort the following binary operators in order of high to low precedence: +, -, *, //, /, %, =.

Answer: The general order is PEMDAS.

parentheses, exponents, multiplication, division, addition and subtraction.

so

* , // , / , % > + , - > =

6. Given the following assignment:

x = 2

Indicate what each of the following Python statements would print.

Answers:

(a) print("x") => x

(b) print('x') => x

(c) print(x) => 2

(d) print("x + 1") => x + 1

(e) print('x' + 1) => TypeError: can only concatenate str (not "int") to str

(f) print(x + 1) => 3

7. Given the following assignments:

i1 = 2

i2 = 5

i3 = -3

d1 = 2.0

d2 = 5.0

d3 = -0.5

Evaluate each of the following Python expressions.

Answers:

(a) i1 + i2 => 7

(b) i1 / i2 => 0.4

(c) i1 // i2 => 0

(d) i2 / i1 => 2.5

(e) i2 // i1 => 2

(f) i1 * i3 => -6

(g) d1 + d2 => 7.0

(h) d1 / d2 => 0.4

(i) d2 / d1 => 2.5

(j) d3 * d1 => -1.0

(k) d1 + i2 => 4.0

(l) i1 / d2 => 0.4

(m) d2 / i1 => 2.5

(n) $i2 / d1 \Rightarrow 2.5$
(o) $i1/i2*d1 \Rightarrow 0.8$
(p) $d1*i1/i2 \Rightarrow 0.8$
(q) $d1/d2*i1 \Rightarrow 0.8$
(r) $i1*d1/d2 \Rightarrow 0.8$
(s) $i2/i1*d1 \Rightarrow 5.0$
(t) $d1*i2/i1 \Rightarrow 5.0$
(u) $d2/d1*i1 \Rightarrow 5.0$
(v) $i1*d2/d1 \Rightarrow 5.0$

8. What is printed by the following statement:

```
#print(5/3)
```

Answer: Nothing, because # converts the whole line to a comment.

9. Given the following assignments:

```
i1 = 2  
i2 = 5  
i3 = -3  
d1 = 2.0  
d2 = 5.0  
d3 = -0.5
```

Evaluate each of the following Python expressions.

Answers:

(a) $i1 + (i2 * i3) \Rightarrow -13$
(b) $i1 * (i2 + i3) \Rightarrow 4$
(c) $i1 / (i2 + i3) \Rightarrow 1.0$
(d) $i1 // (i2 + i3) \Rightarrow 1$
(e) $i1 / i2 + i3 \Rightarrow -2.6$
(f) $i1 // i2 + i3 \Rightarrow -3$
(g) $3 + 4 + 5 / 3 \Rightarrow 8.666666666666666$
(h) $3 + 4 + 5 // 3 \Rightarrow 8$
(i) $(3 + 4 + 5) / 3 \Rightarrow 4.0$
(j) $(3 + 4 + 5) // 3 \Rightarrow 4$
(k) $d1 + (d2 * d3) \Rightarrow -0.5$
(l) $d1 + d2 * d3 \Rightarrow -0.5$
(m) $d1 / d2 - d3 \Rightarrow 0.9$
(n) $d1 / (d2 - d3) \Rightarrow 0.36363636363636365$
(o) $d1 + d2 + d3 / 3 \Rightarrow 6.833333333333333$
(p) $(d1 + d2 + d3) / 3 \Rightarrow 2.1666666666666665$
(q) $d1 + d2 + (d3 / 3) \Rightarrow 6.833333333333333$
(r) $3 * (d1 + d2) * (d1 - d3) \Rightarrow 52.5$

10. What symbol signifies the beginning of a comment in Python?

Answer: it is Hashtag ('#').

11. How do Python comments end?

Answer: comments, are line elements, so if the line changes, comment will end.

12. Which is better, too many comments or too few comments?

Answer: The happy medium is moderate amount of useful comments. but, "when in doubt, add a remark" as the book explains itself...

13. What is the purpose of comments?

Answer: human readability:

in case a piece of code needs to be modified by another programmer or even the same programmer, comments

For each line listed in the comments, indicate whether or not an interpreter error, run-time exception, or logic error is present. Not all lines contain an error.

17. Write the shortest way to express each of the following statements.

Answers:

- (a) $x = x + 1$ $\Rightarrow x += 1$
- (b) $x = x / 2$ $\Rightarrow x /= 2$
- (c) $x = x - 1$ $\Rightarrow x -= 1$
- (d) $x = x + y$ $\Rightarrow x += y$
- (e) $x = x - (y + 7)$ $\Rightarrow x -= y + 7$
- (f) $x = 2 * x$ $\Rightarrow x *= 2$
- (g) $\text{number_of_closed_cases} = \text{number_of_closed_cases} + 2 * \text{ncc}$
 $\Rightarrow \text{number_of_closed_cases} += 2 * \text{ncc}$

18. What is printed by the following code fragment?

Answers:

```
x1 = 2
x2 = 2
x1 += 1
x2 -= 1
print(x1) => 3
print(x2) => 1
```

Why does the output appear as it does?

Answer: Because $x1 += 1$ means $x1 = x1 + 1$ and $x2 -= 1$ means $x2 = x2 - 1$

19. Consider the following program that attempts to compute the circumference of a circle given the radius entered by the user. Given a circle's radius, r , the circle's circumference, C is given by the formula:

$$C = 2\pi r$$

```
r = 0
PI = 3.14159
# Formula for the area of a circle given its radius
C = 2*PI*r
=> r is not defined yet.
# Get the radius from the user
r = float(input("Please enter the circle's radius: "))
=> should be above C = 2*PI*r
# Print the circumference
print("Circumference is", C)
(a) The program does not produce the intended result. Why?
    It's explained above.
(b) How can it be repaired so that it works correctly?
PI = 3.14159
r = float(input("Please enter the circle's radius: "))
C = 2*r*PI
print("Circumference is: ", C)
```