Fundementals of python programming:

chapter 3, section 10 (Exercises):

1. Is the literal 4 a valid Python expression?

=>No.

2. Is the variable x a valid Python expression?

=>No.

3. Is x + 4 a valid Python expression?

=>yes, but x should be defined.

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

=>No effect all numeric values are positive by default.

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

=>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.

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

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

(c) print(x) =>2

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

(e) print('x' + 1) =>type error

(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.

(a) i1 + i2 =>7

(b) i1 / i2 =>2/5 = 0.4

(c) i1 // i2 =>2//5 = 0

(d) i2 / i1 =>5/2 = 2.5

(e) i2 // i1 =>5//2 = 2

(f) i1 * i3 =>2 * -3 = -6

(g) d1 + d2 =>2.0 + (-0.5) = 1.5

(h) d1 / d2 =>2.0/5.0 = 0.4

(i) d2 / d1 =>5.0/2.0 = 2.5

(j) d3 * d1 =>-0.5 * 2.0 = -1.0

(k) d1 + i2 =>2.0 + 5 = 7.0

(l) i1 / d2 =>2/5.0 = 0.4

(m) d2 / i1 =>5.0/2 = 2.5

(n) i2 / d1 =>5/5.0 = 1.0

(o) i1/i2*d1 =>2/5*2.0 = 0.8

(p) d1*i1/i2 =>2.0*2/5 = 0.8

(q) d1/d2*i1 =>2.0/5.0*2 = 0.8

(r) i1*d1/d2 =>2*2.0/5.0 = 0.8

(s) i2/i1*d1 =>5/2*2.0 = 5.0

(t) d1*i2/i1 =>2.0*5/2 = 5.0

(u) d2/d1*i1 =>5.0/2.0*2 = 5.0

(v) i1*d2/d1 =>2*5.0/2.0 = 2.0

8. What is printed by the following statement:

#print(5/3) =># converts the whole line to a comment, so nothing.

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.

(a) i1 + (i2 * i3) =>2+(5*-3)= -13

(b) i1 * (i2 + i3) =>2*(5-3) = 4

(c) i1 / (i2 + i3) =>2/(5-3) = 1.0

(d) i1 // (i2 + i3) =>2//(5-3) = 1

(e) i1 / i2 + i3 => 2/5 -3 = -2.6

(f) i1 // i2 + i3 => 2//5 -3 = -3

(g) 3 + 4 + 5 / 3 =>8.66...

(h) 3 + 4 + 5 // 3 =>8

(i) (3 + 4 + 5) / 3 =>4.0

(j) (3 + 4 + 5) // 3 => 4

(k) d1 + (d2 * d3)

=>2.0 + (5.0 * -0.5) = -0.5

(l) d1 + d2 * d3

=>2.0 + 5.0 * -0.5 = -0.5

(m) d1 / d2 - d3

=>2.0 / 5.0 - (-0.5) = 0.9

(n) d1 / (d2 - d3)

=>2.0/(5.0 - (-0.5)) = 0.3636...

(o) d1 + d2 + d3 / 3

=>2.0 + 5.0 -0.5/3 = 2.88...

(p) (d1 + d2 + d3) / 3

=>(2.0 + 5.0 - 0.5)/3 = 2.166...

(q) d1 + d2 + (d3 / 3)

=>2.0+5.0+(-0.5/-3) = 7.66...

(r) 3 * (d1 + d2) * (d1 - d3)

=>3*(2+5)*(2.0 - (-0.5)) = 52.5

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

=>#

11. How do Python comments end?

=>comments, are line elements, so if the line changes, comment will end.

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

comments?

=>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?

=>human readability:

in case a piece of code needs to be modified by another programmer or even the same programmer, comments aid them in reading and understanding the code faster.

14. Why is human readability such an important consideration?

=>"Programmers are more important then programs"

humans write code, so it is crucial that they understand the code easier and faster.

15. What circumstances can cause each of the following run-time errors to arise?

- NameError

=>using undefined variable

- ValueError

=>wrong value given to functions, like int('pizza')

- ZeroDivisionError

=>dividing by zero: 2/0

- IndentationError

=>python declares blocks by indentation, so unnecessary indentation may cause this error

- OverflowError

=>math operations having very large results:

1.5**9999

- SyntaxError

=>incomplete code, or problems regarding the way python should be written: print)

- TypeError

=>trying to work with incompatible types: print("your age is: " + 13)

16. Consider the following program which contains some errors. You may assume that the comments within the program accurately describe the program's intended behavior.

```
# Get two numbers from the user

n1 = float(input()) # 1

n2 = float(input()) # 2

# Compute sum of the two numbers

print(n1 + n2) # 3

# Compute average of the two numbers

print(n1+n2/2) # 4

# Assign some variables

d1 = d2 = 0 # 5
```

=>both d1 and d2 are 0, d2 is useless.

Compute a quotient

print(n1/d1) # 6

=>zeroDivisionError since d1 is 0

Compute a product

n1*n2 = d1 # 7

=>d1 = n1*n2

Print result print(d1) # 8

For each line listed inthe 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.

(a) x = x + 1 =>x += 1

(b) x = x / 2 =>x /=2

(c) x = x - 1 =>x -= 1

(d) x = x + y =>x += y

(e) x = x - (y + 7) =>x -= y+7

(f) x = 2*x =>x *= 2

(g) number_of_closed_cases = number_of_closed_cases + 2*ncc

=> number_of_closed_cases += 2*ncc

18. What is printed by the following code fragment?

x1 = 2

x2 = 2

x1 += 1

x2 -= 1

print(x1) =>3

print(x2) =>1

Why does the output appear as it does?

=> 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?

=> 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)