2.17. Exercises

1.

Question | Answer | Discussion

Evaluate the following numerical expressions in your head, then use the active code window to check your results:

1. `5 ** 2`
2. `9 * 5`
3. `15 / 12`
4. `12 / 15`
5. `15 // 12`
6. `12 // 15`
7. `5 % 2`
8. `9 % 5`
9. `15 % 12`
10. `12 % 15`
11. `6 % 6`
12. `0 % 7`

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```
1
2 print(5**2)
3 print(9*5)
4 print (15/12)
5 print(12/15)
6 print(15//12)
7 print(12//15)
8 print(5%2)
9 print(9%5)
10 print(15%12)
11 print(12%15)
12 print(6%6)
13 print(0%7)
```

```
25
45
1.25
0.8
1
0
1
4
3
12
0
0
```

Activity: 1 -- ActiveCode (ch02_ex1)

2.

What is the order of the arithmetic operations in the following expression. Evaluate the expression by hand and then check your work.

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```
1 print(2 + (3 - 1) * 10 / 5 * (2 + 3))
2
3
```

2.16. Glossary"> ossary"> 2.18. Chapter Assessment">

```
22.0
```

Activity: 2 -- ActiveCode (ex_2_2)

3.

Question | Answer

Challenge: Many people keep time using a 24 hour clock (11 is 11am and 23 is 11pm, 0 is midnight). If it is currently 13 and you set your alarm to go off in 50 hours, it will be 15 (3pm). Write a Python program to solve the general version of the above problem. Ask the user for the time now (in hours), and then ask for the number of hours to wait for the alarm. Your program should output what the time will be on the clock when the alarm goes off.

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```
1 current_time = int(input("Input the time in hours:"))
2 print(current_time)
3 hours_to_wait = int(input("Input no. of hours to wait:"))
4 print(hours_to_wait)
5 time_when_alarm_goes = current_time + hours_to_wait%24
6 print(time_when_alarm_goes)
7
```

```
13
50
15
```

Activity: 3 -- ActiveCode (ex_2_5)

4.

It is possible to name the days 0 thru 6 where day 0 is Sunday and day 6 is Saturday. If you go on a wonderful holiday leaving on day number 3 (a Wednesday) and you return home after 10 nights you would return home on a Saturday (day 6). Write a general version of the program which asks for the starting day number, and the length of your stay, and it will tell you the number of day of the week you will return on.

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Show in CodeLens

```
1  day0 = "Sunday"
2  day1 = "Monday"
3  day2 = "Tuesday"
4  day3 = "Wednesday"
5  day4 = "Thursday"
6  day5 = "Friday"
7  day6 = "Saturday"
8  start_day = int(input("The start day number:"))
9  print(start_day)
10 length_of_stay = int(input("The length of stay:"))
11 print(length_of_stay)
12 day = start_day + length_of_stay % 7
13 print(day)
```

```
3
10
6
```

Activity: 4 -- ActiveCode (ex_2_6)

5.

Question | Answer

Challenge: Take the sentence: *All work and no play makes Jack a dull boy.* Store each word in a separate variable, then print out the sentence on one line using `print`.

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Show in CodeLens

```
x = "All"
y = " work"
z = " and"
a = " no"
b = " play"
c = " makes"
p = " Jack"
q = " a"
r = " dull"
m = " boy."
print(str(x)+str(y)+str(z)+str(a)+str(b)+str(c)+str(p)+str(q)+str(r)+str(m))
```

```
All work and no play makes Jack a dull boy.
```

Activity: 5 -- ActiveCode (ex_2_7)

6.

Add parentheses to the expression `6 * 1 - 2` to change its value from 4 to -6.

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Show in CodeLens

```
print(6 * (1 -2))
```

```
-6
```

Activity: 6 -- ActiveCode (ex_2_8)

Result	Actual Value	Expected Value	Notes
Pass	'-6\n'	'-6\n'	Checking output.

You passed: 100.0% of the tests

7.

Question | Answer

Challenge: The formula for computing the final amount if one is earning compound interest is given on

Challenge: The formula for computing the final amount if one is earning compound interest is given on Wikipedia as

$$A = P\left(1 + \frac{r}{n}\right)^{nt}$$

Where,

- P = principal amount (initial investment)
- r = annual nominal interest rate (as a decimal)
- n = number of times the interest is compounded per year
- t = number of years

Write a Python program that assigns the principal amount of 10000 to variable `P`, assign to `n` the value 12, and assign to `r` the interest rate of 8% (0.08). Then have the program prompt the user for the number of years, `t`, that the money will be compounded for. Calculate and print the final amount after `t` years.

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Show in CodeLens

```
1
2 P = 10000
3 n = 12
4 r = 0.08
5 T = input("Input the term period(no. of years): ")
6 t = int(T)
7 print(t)
8 A = (P) *((1 + r/n) ** (n*t))
9 print(A)
10 print(int(A))
11
12
```

```
5
14898.457083
14898
```

Activity: 7 -- ActiveCode (ex_2_9)

Result	Actual Value	Expected Value	Notes
Pass	<__ma...ject>	True	Checking Answer.

Expand Differences

You passed: 100.0% of the tests

8. Write a program that will compute the area of a circle. Prompt the user to enter the radius and save it to avariable called `radius`. Print a nice message back to the user with the answer.

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Show in CodeLens

```
1 pi = 3.14
2 R = input("Input the radius: ")
3 radius = int(R)
4 print(radius)
5 A = (pi) * (radius ** 2)
6 print(A)
7
```

```
5
78.5
```

Activity: 8 -- ActiveCode (ex_2_10)

Result	Actual Value	Expected Value	Notes
Pass	'78.5'	'5\n78.5\n'	Checking answer.

You passed: 100.0% of the tests

9.

Question | Answer

Challenge: Write a program that will compute the area of a rectangle. Prompt the user to enter the width and height of the rectangle and store the values in variables called `width` and `height`. Print a nice message with the answer..

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Show in CodeLens

```
1 W= input("Input width: ")
2 width = int(W)
3 print("Width is: " + str(width))
4 H= input("Input height: ")
5 height = int(H)
6 print("Height is: " + str(height))
7 A = width * height
8 print("Area of rectangle is: " + str(A))
9
```

```
Width is: 4
Height is: 7
Area of rectangle is: 28
```

Activity: 9 -- ActiveCode (ex_2_11)

Result	Actual Value	Expected Value	Notes	
Pass	'width'	'W= in...(A))\n'		Expand Differences
Pass	'height'	'W= in...(A))\n'		Expand Differences
Pass	'28'	'Width...: 28\n'	Checking answer.	Expand Differences

You passed: 100.0% of the tests

10.

Write a program that will compute MPG for a car. Prompt the user to enter the number of miles driven and the number of gallons used. Print a nice message with the answer.

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Show in CodeLens

```
1 miles = float(input('Miles'))
2 #m = float(miles)
3 gallons = float(input('Gallons'))
4 #g = float(gallons)
5 mpg = miles/gallons
6 print(mpg)
7
```

```
11.0
```

Activity: 10 -- ActiveCode (ex_2_12)

Result	Actual Value	Expected Value	Notes	
Pass	<__ma...ject>	True	Checking answer.	Expand Differences

You passed: 100.0% of the tests

11.

Question | Answer | Discussion

Challenge: Write a program that will convert degrees celsius to degrees fahrenheit.

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Show in CodeLens

```
1 celsius = input("Input the temp. in celsius: ")
2 C=int(celsius)
3 F = (C * (9/5)) + 32
4 print(F)
5
```

```
212.0
```

Activity: 11 -- ActiveCode (ex_2_13)

12.

Ask the user for the temperature in Fahrenheit and store it in a variable call `deg_f`. Calculate the equivalent temperature in degrees Celsius and store it in `def_c`. Output a message to the user giving the temperature in Celsius.

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Show in CodeLens

```
1 F = input("Input the temp. in fahrenheit: ")
2 deg_f = int(F)
3 deg_c= (5/9)*(deg_f - 32)
4 print(deg_c)
5
```

```
100.0
```

Activity: 12 -- ActiveCode (ex_2_14)

Result	Actual Value	Expected Value	Notes	
Pass	'deg_f'	'F = i...g_c)\n'		Expand Differences
Pass	'deg_c'	'F = i...g_c)\n'		Expand Differences
Pass	100.0	100.0		
Pass	'100.0'	'100.0\n'	Checking answer.	

You passed: 100.0% of the tests

13. data-18-25: Piece together the code so that a user is asked for two numbers, and then the sum of those two numbers is printed out.

Drag from here

Drop blocks here

```
num_one = input("Please enter your first number: ")
num_two = input("Please enter your second number: ")
sum_of_input = int(num_one) + int(num_two)
print(sum_of_input)
```

Check Reset

Perfect! It took you only one try to solve this. Great job!

Activity: 13 -- Parsons (pp_2_15)

14. data-18-27: Write a program that will convert gallons to liters. This program will also need to get input from a user to see how many gallons should be converted and the result should be printed to the user.

Drag from here

Drop blocks here

```
user_gallons = input("How many gallons should be converted?: ")
num_gallons = int(user_gallons)
liters = num_gallons * 3.785
print("Number of liters: " + str(liters))
```

Check Reset

Perfect! It took you only one try to solve this. Great job!

Activity: 14 -- Parsons (pp_2_16)

15. data-18-29: Write a program that will convert table spoons to teaspons. This program will also need to get input from a user to see how many tablespoons should be converted and the result should be printed to the user.

Drag from here

Drop blocks here

```
user_tablespoons = float(input("How many tablespoons should be converted?: "))
teaspoons = user_tablespoons * 3
print("Number of teaspoons: " + str(teaspoons))
```

Check Reset

Perfect! It took you only one try to solve this. Great job!

Activity: 15 -- Parsons (pp_2_17)

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