Exercises

Question | Answer

1. 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`

```
print(5**2)
print (9*5)
print (15/12)
print (12/15)
print (15//12)
print (12//15)
print (5%2)
print (9%5)
print (15%12)
print (12%15)
print (6%6)
print (0%7)


```

ActiveCode: 1 (ch02_ex1)

Run

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

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

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

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

ActiveCode: 2 (ex_2_2)

Run

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```
22.0
```

Question Answer

3. 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.

```
1  timenow = input("Please enter the current time in 24-hour format.")
2  waittime = input("How many hours would you like to wait?")
3
4  timenowint = int(timenow)
5  waittimeint = int(waittime)
6
7  hours = timenowint + waittimeint
8
9  timeofday = hours % 24
10
11 print (timeofday)
12
13
14
```

ActiveCode: 3 (ex_2_3)

Run

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```
15
```

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. 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.

```
# Problem 4
# My Name: Donald Marovich

currentday_string = input("What is the starting day?")
currentday_int = int(currentday_string)

holidaylength_string = input("How many days will you be on holiday?")
holidaylength_int = int(holidaylength_string)

outputday = currentday_int + holidaylength_int

outputday_final = outputday % 6

print ("You will return on the number", outputday_final, "day of the w
```

ActiveCode: 4 (ex_2_4)

Run

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```
You will return on the number 0 day of the week.
```

Question Answer

5. 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`.

```
word1 = "All"
word2 = "work"
word3 = "and"
word4 = "no"
word5 = "play"
word6 = "makes"
word7 = "Jack"
word8 = "a"
word9 = "dull"
word10 = "boy."

print (word1, word2, word3, word4, word5, word6, word7, word8, word9, w

```

ActiveCode: 5 (ex_2_5)

Run

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

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

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

```

ActiveCode: 6 (ex_2_6)

Run

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```
-6
```

Question | Answer

7. 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.

```
1  P = int(10000)
2  n = int(12)
3  r = float(0.08)
4  years = input("Number of years...")
5
6  t = int(years)
7
8  A = P*((1+(r/t))**(n*t))
9  print("$",A)
10
```

ActiveCode: 7 (ex_2_7)

Run

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```
$ 25919.25276017211
```

8. Write a program that will compute the area of a circle. Prompt the user to enter the radius and print a nice message back to the user with the answer.

```
1 radiusinput = input("What is the radius?")
2 radius = float(radiusinput)
3 pi = 3.14
4
5
6
7 print("The area of the circle is",(pi*(radius**2)))
8
```

ActiveCode: 8 (ex_2_8)

Run

Show/Hide Code

```
The area of the circle is 50.24
```

Question Answer

9. Write a program that will compute the area of a rectangle. Prompt the user to enter the width and height of the rectangle. Print a nice message with the answer.

```
lengthinput = input("What is the length?")
widthinput = input("What is the width?")

length = int(lengthinput)
width = int(widthinput)

area = length*width

print("The area of the rectangle is", area)

```

ActiveCode: 9 (ex_2_9)

Run

Show/Hide Code

```
The area of the rectangle is 24
```

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.

```
milesinput = input("How many miles did you drive?")
gallonsinput = input("How many gallons did you use?")

miles = int(milesinput)
gallons = int(gallonsinput)

mpg = miles/gallons

print("The MPG for your car was...",mpg)

```

ActiveCode: 10 (ex_2_10)

Run

Show/Hide Code

```
The MPG for your car was... 30
```

Question Answer

11. Write a program that will convert degrees celsius to degrees fahrenheit.

```
1 celciusinput = input("What is the temperature in Celcius?")
2 celcius = int(celciusinput)
3
4 temperature = celcius*(9/5)+32
5
6 print("The temperature is",temperature,"degrees Fahrenheit.")
```

ActiveCode: 11 (ex_2_11)

Run

Show/Hide Code

```
The temperature is 86 degrees Fahrenheit.
```

12. Write a program that will convert degrees fahrenheit to degrees celsius.

```
fahrenheitinput = input("What is the temperature in Fahrenheit?")
fahrenheit = int(fahrenheitinput)

temperature = ((fahrenheit-32)*(5/9))

print("The temperature is",temperature,"degrees Celcius.")
```

ActiveCode: 12 (ex_2_12)

Run

Show/Hide Code

```
The temperature is 32.22222222222222 degrees Celcius.
```