Homework: Session 1

Additional resources:
- Python data-types ★ https://realpython.com/python-data-types/
- Strings ★ https://realpython.com/python-strings/
- String formatting (includes two common alternatives to the string formatting method covered in the session) ★ https://realpython.com/python-string-formatting/
- Understanding error messages ★ https://realpython.com/python-traceback/
- Variables ★ https://realpython.com/python-variables/

Question 1
I am building some very high quality chairs and need exactly four nails for each chair. I've written a program to calculate how many nails I need to buy to build these chairs.

```python
chairs = '15'
nails = 4

total_nails = chairs * nails

message = 'I need to buy {} nails'.format(total_nails)

print('You need to buy {} nails'.format(message))
```

When I run the program it tells me that I need to buy 15151515 nails. This seems like a lot of nails.

Is my program calculating the total number of nails correctly? What is the problem? How do I fix it?

Question 2
I'm trying to run this program, but I get an error. What is the error telling me is wrong? How do I fix the program?

```python
my_name = Penelope
my_age = 29

message = 'My name is {} and I am {} years old'.format(my_name, my_age)
print(message)
```

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Question 3

I have a lot of boxes of eggs in my fridge and I want to calculate how many omelettes I can make. Write a program to calculate this.

Assume that a box of eggs contains six eggs and I need four eggs for each omelette, but I should be able to easily change these values if I want. The output should say something like "You can make 9 omelettes with 6 boxes of eggs".

Homework: Session 2

Additional resources:
- Input ★ https://realpython.com/python-input-output/
- turtle module documentation ★ https://docs.python.org/3/library/turtle.html
- for loops ★ https://realpython.com/python-for-loop/
- functions ★ https://www.datacamp.com/community/tutorials/functions-python-tutorial

Question 1
Explain what this program does

```
for number in range(100):
    output = 'o' * number
      print(output)
```

Question 2
Your boss really likes calculating VAT on their purchases. It is their favourite hobby. They've written this code to calculate VAT and need your help to fix it.

```
def calculate_vat(amount):
    amount * 1.2


total = calculate_vat(100)
print(total)
```

When your boss runs the program they get the following output:

```
None
```

Your boss expects the program to output the value 120. What is wrong? How do you fix it?

Question 3
Using the turtle module, write a program to draw a house. The house should at least have a roof, a door and some windows. Feel free to play around with the design of your house.

Homework: Session 3

Additional resources:
- Comparisons ★ https://realpython.com/python-operators-expressions/
- if statements ★ https://realpython.com/python-conditional-statements/

Question 1
Create a program that tells you whether or not you need an umbrella when you leave the house.

The program should:
1. Ask you if it is raining using input()
2. If the input is 'y', it should output 'Take an umbrella'
3. If the input is 'n', it should output 'You don't need an umbrella'

Question 2
I'm on holiday and want to hire a boat. The boat hire costs £20 + a refundable £5 deposit. I've written a program to check that I can afford the cost, but something doesn't seem right.

Have a look at my program and work out what I've done wrong

```
my_money = input('How much money do you have? ')
boat cost = 20 + 5

if my_money < boat_cost:
      print('You can afford the boat hire')
else:
      print('You cannot afford the board hire')
```

Question 3
Your friend works for an antique book shop that sells books between 1800 and 1950 and wants to quickly categorise books by the century and decade that they were written.

Write a program that takes a year (e.g. 1872) and outputs the century and decade (e.g. "Eighteenth Century, Seventies")

Homework: Session 4

Additional resources:
- Lists ★ https://realpython.com/python-lists-tuples/
- Dictionaries ★ https://realpython.com/python-dicts/

Question 1
I have a list of things I need to buy from my supermarket of choice.

```
shopping_list = [
    "oranges",
    "cat food",
    "sponge cake",
    "long-grain rice",
    "cheese board",
]


print(shopping_list[1])
```

I want to know what the first thing I need to buy is. However, when I run the program it shows me a different answer to what I was expecting?

What is the mistake? How do I fix it?

Question 2
I'm setting up my own market stall to sell chocolates. I need a basic till to check the prices of different chocolates that I sell.

I've started the program and included the chocolates and their prices. Finish the program by asking the user to input an item and then output its price.

```
chocolates = {
    'white': 1.50,
    'milk': 1.20,
    'dark': 1.80,
    'vegan': 2.00,
}
```

Question 3

Write a program that simulates a lottery. The program should have a list of seven numbers that represent a lottery ticket. It should then generate seven random numbers. After comparing the two sets of numbers, the program should output a prize based on the number of matches:

- £20 for three matching numbers
- £40 for four matching numbers
- £100 for five matching numbers
- £10000 for six matching numbers
- £1000000 for seven matching numbers

Homework: Session 5

Additional resources:
- Requests ★ https://realpython.com/python-requests/
- Requests official documentation ★ https://2.python-requests.org/en/master/
- Pip ★ https://realpython.com/what-is-pip/
- PyPI ★ https://pypi.org/

Question 1
You're having coffee/tea/beverage of your choice with a friend that is learning to program in Python. They're curious about why they would use pip.

Explain what pip is and one benefit of using pip.

Question 2
This program should save my data to a file, but it doesn't work when I run it. What is the problem and how do I fix it?

```
poem = 'I like Python and I am not very good at poems'

with open('poem.txt', 'r') as poem_file:
    poem_file.write(poem)
```

Question 3
In this session you used the Pokemon API to retrieve a single Pokemon. I want a program that can retrieve multiple Pokemon and save their names and moves to a file.

Use a list to store about 6 Pokemon IDs. Then in a for loop call the API to retrieve the data for each Pokemon. Save their names and moves into a file called 'pokemon.txt'

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