

Homework01_dso545_Fall24_Questions_YB_final

September 9, 2024

1 Homework 1

1.0.1 Due: Friday Sep 13, at 11:59pm via Brightspace

1.0.2 Q1. (6 points) Given the following list of characters: 'a', 'b', 'c', 'd', 'e', 'f', 'g', 1, 2, 3. Create a Python list to store all of the characters. Store the list in a variable alphabet.

```
[1]: alphabet = ['a', 'b', 'c', 'd', 'e', 'f', 'g', 1, 2, 3]
```

1.1 Use indexing techniques to retrieve the first half of the list.

```
[3]: half_index = int(len(alphabet) / 2)
first_half = alphabet[0:half_index]
print(first_half)
```

```
['a', 'b', 'c', 'd', 'e']
```

1.2 Use indexing techniques to retrieve every other character in the list.

```
[5]: every_other_character = [alphabet[i] for i in range(0, len(alphabet), 2)]
print(every_other_character)
```

```
['a', 'c', 'e', 'g', 2]
```

1.3 Use indexing techniques to print the list in reverse.

```
[7]: reversed_alphabet = [alphabet[i] for i in range(-1, -(len(alphabet)), -1)]
print(reversed_alphabet)
```

```
[3, 2, 1, 'g', 'f', 'e', 'd', 'c', 'b']
```

1.4 Use indexing techniques to print every other character in reverse.

```
[9]: reversed_every_other_character = [alphabet[i] for i in range(-1,
↪ -(len(alphabet)+1), -2)]
print(reversed_every_other_character)
```

```
[3, 1, 'f', 'd', 'b']
```

1.5 Using the reverse method, print the list in reverse

```
[23]: alphabet.reverse()
      print(alphabet)
```

```
[3, 2, 1, 'g', 'f', 'e', 'd', 'c', 'b', 'a']
```

1.0.3 Q2. (3 points) For a circle of radius 2, calculate and display the diameter, circumference, and area. Use the value 3.14159 for π . Your output should like as follows:

Expected Output

The diameter of a circle with radius 2 is 4.

The circumferene of a circle with radius 2 is 12.56636.

The area of a circle with radius 2 is 12.56636.

```
[8]: pi = 3.14159
      radius = 2
      diameter = radius * 2
      circumference = diameter * pi
      area = (radius ** 2) * pi

      print(f'The diameter of a circle with radius {radius} is {diameter}.')
      print(f'The circumferene of a circle with radius {radius} is {circumference}.')
      print(f'The area of a circle with radius {radius} is {area}.')
```

The diameter of a circle with radius 2 is 4.

The circumferene of a circle with radius 2 is 12.56636.

The area of a circle with radius 2 is 12.56636.

Q3. (4 points) Some investment advisors say that it's reasonable to expect a 7% return over the long term in the stock market. Assuming that you begin with \$10,000 and leave your money invested, calculate and display how much money you'll have after 10, 20, and 30 years. Use the following formula for determining these amounts:

$$a = p(1 + r)^n$$

where

p is the original amount invested

r is the annual rate of return

n is the number of years

a is the amount on deposit at the end of the n^{th} year.

```
[25]: p = 10000
      r = 0.07

      def compound_interest_calculator(n):
```

```

    a = p * ((1 + r) ** n)
    return a

print(f'The amount of money after 10 years is_
↪{compound_interest_calculator(10)} The amount of money after 20 years is_
↪{compound_interest_calculator(20)} The amount of money after 30 years is_
↪{compound_interest_calculator(30)}')
```

The amount of money after 10 years is 19671.513572895663 The amount of money after 20 years is 38696.844624861835 The amount of money after 30 years is 76122.55042662042

Expected answers: The amount of money after 10 years is 19671.513572895663 The amount of money after 20 years is 38696.844624861835 The amount of money after 30 years is 76122.55042662042

Q4. (2 points) Investigate the Python built-in function `round()` at <https://docs.python.org/3/library/functions.html#round>, then use it to round the float value 12.56449 to the nearest integer; ii) tenth; iii) hundredth; iv) and thousandths position.

```
[29]: print(round(12.56449))
      print(round(12.56449, 1))
      print(round(12.56449, 2))
      print(round(12.56449, 3))
```

```

13
12.6
12.56
12.564
```

Q5. (4 points) Given two lists: the first represents a selection of cryptoassets, and the second represents the cryptoassets corresponding marketcap in billions of dollars:

- Crypto assets = Bitcoin, Cardano, Ethereum, and Dogecoin
- Marketcap = 1136, 12, 293, 14

(Note: the given marketcap was recorded on 8/31/24)

```
[34]: crypto_assets = ['Bitcoin', 'Cardano', 'Ethereum', 'Dogecoin']
      marketcap = [1136, 12, 293, 14]
```

5.1 Use a for loop to compute the total marketcap for all four currencies together.

```
[36]: total_marketcap = 0
      for value in marketcap:
          total_marketcap += value
      print(total_marketcap)
```

```

1455
```

5.2 Use list comprehension to list all market caps above \$250B.

```
[44]: [crypto_assets[i] for i in range(len(marketcap)) if marketcap[i] > 250]
```

```
[44]: ['Bitcoin', 'Ethereum']
```

5.3 Create a dictionary that contains the name of the cryptoasset as key and its corresponding marketcap as values for the dictionary.

```
[77]: crypto_dict = {asset: value for asset, value in zip(crypto_assets, marketcap)}  
print(crypto_dict)
```

```
{'Bitcoin': 1136, 'Cardano': 12, 'Ethereum': 293, 'Dodgecoin': 14}
```

5.4 Use the dictionary data structure you created for the cryptoassets to print the name of the asset and its marketcap as follows (use for loop):

Expected Output:

The marketcap for Bitcoin is \$1136B

The marketcap for Cardano is \$12B

The marketcap for Ethereum is \$293B

The marketcap for Dodgecoin is \$14B

```
[79]: for asset, value in crypto_dict.items():  
      print(f"The marketcap for {asset} is ${value}B")
```

The marketcap for Bitcoin is \$1136B

The marketcap for Cardano is \$12B

The marketcap for Ethereum is \$293B

The marketcap for Dodgecoin is \$14B