Homework 1

Due: Friday Sep 8, at 11:59pm via Blackboard

Q1. *(4 points)* Given the following list of characters: 'a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'j'. Create a Python list to store all of the characters. Store the list in a variable `alphabet`.

```
In [1]:  alphabet = ['a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'j']
```

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

```
In [2]:  alphabet[:int(len(alphabet)/2)]
```
```
Out[2]:  ['a', 'b', 'c', 'd', 'e']
```

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

```
In [3]:  alphabet[int(len(alphabet)/2):]
```
```
Out[3]:  ['f', 'g', 'h', 'i', 'j']
```

1.3 Use indexing techniques to print the list in reverse.

```
In [4]:  alphabet.sort(reverse=True)
         alphabet[:int(len(alphabet)/2)]
```
```
Out[4]:  ['j', 'i', 'h', 'g', 'f']
```

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

```
In [5]:  alphabet[int(len(alphabet)/2):]
```
```
Out[5]:  ['e', 'd', 'c', 'b', 'a']
```

Q2. *(2 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.

```
In [6]:  circle_radius = 2
         pi_value = 3.14159

         print(f'The diameter of a circle with radius {circle_radius} is {2*circle_ra
```

```
print(f'The circumference of a circle with {circle_radius} is {2*circle_radi
print(f'The area of a circle with radius {circle_radius} is {circle_radius*
```

```
The diameter of a circle with radius 2 is 4.
The circumference of a circle with 2 is 12.56636.
The area of a circle with radius 2 is 12.56636.
```

Q3. *(3 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 nth year.

In [7]:
```python
amount_invested = 10000
annual_rate = 0.07
year_invested = [10, 20, 30]

for i in year_invested:
    print(f'The total amount on deposit after {i} years would be ${amount_in
```

```
The total amount on deposit after 10 years would be $19671.513572895663.
The total amount on deposit after 20 years would be $38696.844624861835.
The total amount on deposit after 30 years would be $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.

In [8]:
```python
value = 12.56449
print(round(value, 1))
print(round(value, 2))
print(round(value, 3))
```

```
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 Dodgecoin
- Marketcap = 927, 78, 379, 42

(Note: the given marketcap was recorded on 8/21/21)

In [9]:
```python
crypto_assets = ['Bitcoin', 'Ethereum', 'Cardano', 'Dodgecoin']
marketcap = [927, 379, 78, 42]
```

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

In [10]:
```python
total_marketcap = 0

for value in marketcap:
    total_marketcap += value

total_marketcap
```

Out[10]: 1426

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

In [11]:
```python
[value for value in marketcap if value > 250]
```

Out[11]: [927, 379]

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

In [12]:
```python
crypto_dict = dict(zip(crypto_assets, marketcap))
crypto_dict
```

Out[12]: {'Bitcoin': 927, 'Ethereum': 379, 'Cardano': 78, 'Dodgecoin': 42}

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 $927B

The marketcap for Ethereum is $379B

The marketcap for Cardano is $78B

The marketcap for Dodgecoin is $41B

In [13]:
```python
for keys in crypto_dict:
    print(f'The marketcap for {keys} is ${crypto_dict[keys]}B')
```

```
The marketcap for Bitcoin is $927B
The marketcap for Ethereum is $379B
The marketcap for Cardano is $78B
The marketcap for Dodgecoin is $42B
```