Q1. Create a function which will take a list as an argument and return the product of all the numbers after creating a flat list.

Use the below-given list as an argument for your function.

list1 = [1,2,3,4, [44,55,66, True], False, (34,56,78,89,34), {1,2,3,3,2,1}, {1:34, "key2": [55, 67, 78, 89], 4: (45, 22, 61, 34)}, [56, 'data science'], 'Machine Learning']

Note: you must extract numeric keys and values of the dictionary also

In [1]:
```
def product_of_numbers(lst):
    # Function to flatten the list
    def flatten(lst):
        result = []
        for item in lst:
            if isinstance(item, (list, tuple, set)):
                result.extend(flatten(item))
            elif isinstance(item, dict):
                for key, value in item.items():
                    if isinstance(key, (int, float)):
                        result.append(key)
                    if isinstance(value, (int, float)):
                        result.append(value)
                    elif isinstance(value, (list, tuple, set)):
                        result.extend(flatten(value))
            elif isinstance(item, (int, float)):
                result.append(item)
        return result

    # Flatten the list
    flat_list = flatten(lst)

    # Calculate the product of numbers in the flat list
    product = 1
    for num in flat_list:
        product *= num

    return product

list1 = [1,2,3,4, [44,55,66, True], False, (34,56,78,89,34), {1,2,3,3,2,1}, {1:3

print(product_of_numbers(list1))
```

```
0
```

Q2.Write a python program for encrypting a message sent to you by your friend. The logic of encryption should be such that, for a the output should be z. For b, the output should be y. For c, the output should be x respectively. Also, the whitespace should be replaced with a dollar sign. Keep the punctuation marks unchanged.

Input Sentence: I want to become a Data Scientist.

Encrypt the above input sentence using the program you just created.

Note: Convert the given input sentence into lowercase before encrypting. The final output should be lowercase

In [2]:
```
def encrypt_message(message):
    encrypted_message = ""
    for char in message.lower():
        if char.isalpha():
            # Find the position of the character in the alphabet (a=0, b=1, ...,
            position = ord(char) - ord('a')
            # Replace the character with the corresponding character from the en
            encrypted_char = chr(ord('z') - position)
            encrypted_message += encrypted_char
        elif char.isspace():
            encrypted_message += '$'
        else:
            # Leave punctuation marks unchanged
            encrypted_message += char
    return encrypted_message

input_sentence = "I want to become a Data Scientist."
encrypted_sentence = encrypt_message(input_sentence)
print(encrypted_sentence)
```

```
r$dzmg$gl$yvxlnv$z$wzgz$hxrvmgrhg.
```