CSE401: Artificial Intelligence

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1 Overview of Python

This contains the solution of `List` and `Tuple` questions as the lab assignment.

1.1 List

`List` are mutable ordered and indexed collections of objects. The items of a list are arbitrary Python objects. Lists are formed by placing a comma-separated list of expressions in square brackets.

Q1. Write a Python program to sum all the items in a list.

[1]:
```
numbers = list(map(int, input("Input the numbers: ").split()))

# way 1:
totalSum = 0
for i in numbers:
    totalSum += i

print(f"Total sum is: {totalSum}")

# way 2:
print()
print("Alternatively, we use the 'sum' function in Python:")
print(f"sum(numbers): {sum(numbers)}")
```

```
Input the numbers: 6 8 2 10 4
Total sum is: 30

Alternatively, we use the 'sum' function in Python:
sum(numbers): 30
```

Q2. Write a Python program to get the largest number from a list.

[2]:
```
numbers = list(map(int, input("Input the numbers: ").split()))

# way 1:
numbers.sort()
print(f"The largest number is: {numbers[-1]}")

# way 2:
print()
print("Alternatively, we can use the 'max' function in Python:")
print(f"max(numbers): {max(numbers)}")
```

```
Input the numbers: 6 8 2 10 4
The largest number is: 10

Alternatively, we can use the 'max' function in Python:
max(numbers): 10
```

Q3. Write a Python program to get the smallest number from a list.

[3]:
```
numbers = list(map(int, input("Input the numbers: ").split()))

# way 1:
numbers.sort()
print(f"The smallest number is: {numbers[0]}")

# way 2:
print()
print("Alternatively, we can use the 'min' function in Python:")
print(f"min(numbers): {min(numbers)}")
```

```
Input the numbers: 6 8 2 10 4
The smallest number is: 2

Alternatively, we can use the 'min' function in Python:
min(numbers): 2
```

Q4. Write a Python program to multiply all the items in a list.

[4]:
```
numbers = list(map(int, input("Input the numbers: ").split()))

# way 1:
product = 1
for i in numbers:
    product *= i
print(f"The product of all items: {product}")

# way 2:
import math
print()
print("Alternatively, we can use the 'prod' function from the 'math' library:")
print(f"math.prod(numbers): {math.prod(numbers)}")
```

```
Input the numbers: 6 8 2 10 4
The product of all items: 3840

Alternatively, we can use the 'prod' function from the 'math' library:
math.prod(numbers): 3840
```

1.2 Tuple

`Tuple` is a collection of objects which ordered and immutable. Tuples are sequences, just like lists. The differences between tuples and lists are, the tuples cannot be changed unlike lists and tuples use parentheses, whereas lists use square brackets.

Q1. Write a Python program to create a tuple.

[5]:
```
someTuple = (21, 12)
print(type(someTuple))
print(someTuple)
```

```
<class 'tuple'>
(21, 12)
```

Q2. Write a Python program to create a tuple with different data types.

[6]:
```
someTuple = (21, 'debian', 12)
print(someTuple)
```

```
(21, 'debian', 12)
```

Q3. Write a Python program to create a tuple with numbers and print one item.

[7]:
```
someTuple = tuple(map(int, input("Enter the items: ").split()))
itemNumber = int(input("Enter the item number you want to print: "))

print(f"Item number {itemNumber} is '{someTuple[itemNumber-1]}'.")
```

```
Enter the items: 6 8 2 10 4
Enter the item number you want to print: 3
Item number 3 is '2'.
```

Q4. Write a Python program to add an item in a tuple.

[8]:
```
someTuple = tuple(map(int, input("Enter the items: ").split()))
addItem = input("Enter the item to add: ")

# way 1:
newTuple = someTuple + (addItem,)
print(f"The new tuple is: {newTuple}")

# way 2:
print()
print("Alternatively, we can convert the tuple into list and add items.")
someList = list(someTuple)
someList.append(addItem)
newTuple = tuple(someList)
print(f"The new tuple is: {newTuple}")
```

```
Enter the items: 21 12 2019
Enter the item to add: debian
The new tuple is: (21, 12, 2019, 'debian')

Alternatively, we can convert the tuple into list and add items.
The new tuple is: (21, 12, 2019, 'debian')
```

Q5. Write a Python program to convert a tuple to a string.

[9]:
```
someTuple = tuple(map(str, input("Enter the characters: ").split()))
convertedString = ''.join(someTuple)
print(f"Converted string: '{convertedString}'.")
```

```
Enter the characters: d e b i a n
Converted string: 'debian'.
```
