```python
# -*- coding: utf-8 -*-
"""
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Reference: https://docs.python.org/3/tutorial/index.html
"""

print ()

# Lists are mutable sequences, typically used to store collections of homogeneous items
# lists are represented by comma-separated items within square brackets

# here are examples of some lists
listPeople = ["tom", "harry", "jane", "liz"]
listFlowers = ["rose", "lily", "tulip", "lantana"]
listPets = ['cat', 'turtle', 'goat', 'dog']
listNumFriends = [21, 33, 10, 51]

# lists of heterogenous items are not incorrect, just atypical
listAtypical = [1, 'cat', 0x45, 567]

# print lists
print ("listPeople:       ", listPeople)
print ("listFlowers:      ", listFlowers)
print ("listPets:         ", listPets)
print ("listNumFriends:   ", listNumFriends)
print ("listAtypical:     ", listAtypical)

print ()

# just like strings, you can do following with lists:

# concatenate lists
listConcat = listPeople + listPets
print ("listConcat      -> ", listConcat)

# length of list
print ("len(listPeople) -> ", len(listPeople))

# refer to item in list with index
print ("listPeople[2]   -> ", listPeople[2])
print ("listPeople[-3]  -> ", listPeople[-3])

# slice list with [startIndx:endIndx]
print ("listPeople[2:]  -> ", listPeople[2:])

print ()

# unlike strings, lists are mutable:

# assign to an index
listPets[0] = 'trex'
print (listPets)

# assign to a slice
listPets[0:2] = ['python', 'elephant']
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print (listPets)

# delete a slice
listPets[2:4] = []
print (listPets)

# append new items to a list
listPets.append('fox')
print (listPets)

# clear a list by assigning to an empty list
listPets[:] = []
print (listPets)

print ()

# we can create lists from other lists

# we can assign lists to other lists
sublistPeople = listPeople[0:3]
print("listPeople:   ", listPeople)
print("sublistPeople:", sublistPeople)

print ()

# we can create lists from other list items
listCompiled = [(listPeople[0]).upper(), listFlowers[0], listNumFriends[0]+10]
print ("listPeople:       ", listPeople)
print ("listFlowers:      ", listFlowers)
print ("listNumFriends:   ", listNumFriends)
print ("listCompiled:     ", listCompiled)

print ()

# we can also nest lists
listNested = [listPeople, listFlowers]
print ("listPeople:      ", listPeople)
print ("listFlowers:     ", listFlowers)
print ("listNested:      ", listNested)

# nested list at index 0 - so essentially listPeople
print ("listNested[0]:   ", listNested[0])

# nested list at index 1 - so essentially listFlowers
print ("listNested[1]:   ", listNested[1])

# pick item at index 1 of nested list at index 0
print ("listNested[0][1]:", listNested[0][1])

# pick item at index 2 of nested list at index 1
print ("listNested[1][2]:", listNested[1][2])

print ()

# the Python standard library provides many different methods to  manipulate lists
# https://docs.python.org/3/tutorial/datastructures.html
# below are ones that are most frequently used

lst1 = [100, 200, 300]
lst2 = [5, 15, 25]
lst3 = [10, 50, 50, 20, 0, 10, 50]
print ("lst1: ", lst1)
print ("lst2: ", lst2)
print ("lst3: ", lst3)

# Add an item to the end of the list. Equivalent to lst1[len(lst1):] = [-6000]
lst1.append(-400)
print ("lst1: ", lst1)

# Extend the lst2 by appending all the items in lst1. Equivalent to lst2[len(lst2):] =
lst2.extend(lst1)
print ("lst2: ", lst2)

# Insert an item at index [3]
lst2.insert (3, -400)
print ("lst2: ", lst2)

# Remove the first item from lst2 whose value is -400.
lst2.remove(-400)
print ("lst2: ", lst2)

# Remove the item at index [6]
del lst2[6]
print ("lst2: ", lst2)

# Remove and returns the last item in the list.
lst2.pop()
print ("lst2: ", lst2)

# Return the index in lst3 of the first item whose value is 50
print (lst3.index(50))

# Return the number of times 50 appears in lst3
print (lst3.count(50))

# Reverse the items of lst3 in place.
lst3.reverse()
print ("lst3: ", lst3)

# Sort the items of lst3 in place.
lst3.sort()
print ("lst3: ", lst3)

# Remove all items from the list
lst3.clear()
print ("lst3: ", lst3)

# Delete the list - so now any refrence to the list will be an error
del lst3
#print ("lst3: ", lst3)

print ()
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# test

myStr = "CIS 509"
myLst1 = ['CIS', '509']
myLst2 = ['CIS', 'SCM', 'BDA']

print (myStr[1])

print (myLst1[1])

print (myLst2[-2])

print (MyLst1)

myStr[4] = '5'

myLst2.append('MKTG')
print(myLst2)

print ()
```