Question 3

In [1]:

```
list1 = [1, 2, "c", 4, "e"]
list2 = [6, "g", 7, "i", "j"]
```

In [2]:

```
print("list1: ", list1)
print("list2: ", list2)
```

```
list1:  [1, 2, 'c', 4, 'e']
list2:  [6, 'g', 7, 'i', 'j']
```

In [5]:

```
list3 = list1 + list2
print(list3)
```

```
[1, 2, 'c', 4, 'e', 6, 'g', 7, 'i', 'j']
```

In [4]:

```
list4 = [list1,list2]
print(list4)
```

```
[[1, 2, 'c', 4, 'e'], [6, 'g', 7, 'i', 'j']]
```

In [5]:

```
list1.append("x")
print(list1)
```

```
[1, 2, 'c', 4, 'e', 'x']
```

In [6]:

```
list1.extend(list2)
print(list1)
```

```
[1, 2, 'c', 4, 'e', 'x', 6, 'g', 7, 'i', 'j']
```

In [7]:

```
list1 = [1, 2, "c", 4, "e"]
print(list1[0])
print(list1[3])
print(list1[-1])
```

```
1
4
e
```

In [9]:

```
print(list1[1:3])
print(list1[:])
print(list1[2:])
print(list1[-3:-1])
```

```
[2, 'c']
```

```
[1, 2, 'c', 4, 'e']
['c', 4, 'e']
['c', 4]
```

In [10]:

```
print(list1[2:3])
print(list1[2])
```

```
['c']
c
```

In the code above the first line returns a slice of list1 with a range of one index. The second line returns the value at a single index of the list.

In [11]:

```
list1 = [1, 2, "c", 4, "e"]
list2 = list1
list1.append("x")
print(list2)
```

```
[1, 2, 'c', 4, 'e', 'x']
```

In this statement, setting list2 equal to list1 is not actually creating a new list variable and copying data over from list one but rather creating a list pointer object that points to the same object that list one points to.

In [13]:

```
list1 = [1, 2, "c", 4, "e"]
list2 = list1
list1 = list1 + [6]
print(list1)
print(list2)
```

```
[1, 2, 'c', 4, 'e', 6]
[1, 2, 'c', 4, 'e']
```

In this situation you are setting list1 equal to itself and another list. This requires the creation of a new object. List two is still pointing to the first object.

In [6]:

```
list1 = [1, 2, "c", 4, "e"]
list2 = list1[:]
list1.append("x")
print(list1)
print(list2)
```

```
[1, 2, 'c', 4, 'e', 'x']
[1, 2, 'c', 4, 'e']
```

Here we are setting list2 equal to the values within list1 as opposed to list1 itself. In this situation a new object is created and pointed to by list2.

Question 4

In [10]:

```
def parse(atom):
    for x in range(1,len(atom)):
        if atom[x][0].islower():
            print("constant ", atom[x])
        else:
            print("variable ", atom[x])
            print("variable ", atom[x])
```

In [11]:

```
myatom = ["pred", "foyer", "X", "foyer", "parlour", "Y", "X"]
parse(myatom)
```

```
constant  foyer
variable  X
constant  foyer
constant  parlour
variable  Y
variable  X
```

Question 5

In [23]:

```
def parse(atom):
    d={}
    for x in range(1,len(atom)):
        if atom[x][0].islower():
            d[atom[x]] = "constant "
        else:
            d[atom[x]] = "variable "

    for i in d:
        print ( d[i], i)
```

In [24]:

```
myatom = ["pred", "foyer", "X", "foyer", "parlour", "Y", "X"]
parse(myatom)
```

```
constant  foyer
variable  X
constant  parlour
variable  Y
```