EECE 334 Assignment 1

In this assignment you are required to manipulate a simplified version of python, limited to a set of operations on lists.

The statements to be considered are listed below:

1. Assignment
   1. L=[] (this instruction defines a defines an empty list)
   2. L=[*val\_1*, *val\_2*, …] where values can be of different types. The types to be considered in this assignment are integers and strings. For example, L=[‘hello’, 2, ‘world’] defines a list of three elements.
   3. L[i] = value assigns a value to the ith element of the list. For example, L[1]=4 modifies the above list to: [‘hello’, 4, ‘world’]
2. Concatenation

L1 + L2 creates a new list by concatenating L1 and L2. For example,

[1, 2]+[‘a’, ’b’, ’c’] creates the list [1, 2, ‘a’, ’b’, ’c’]. Concatenating several lists at once should also be supported.

1. Slicing
   1. L[begin\_index:end\_index] returns the portion starting at begin\_index (inclusive) and ending at end\_index (exclusive). For example, the following code would return [’b’,’c’]

L=[‘a’,’b’,’c’,’d’,’e’]

L[1:3]

* 1. L[begin\_index:] returns the portion from begin\_index (inclusive) till the end of the list
  2. L[:end\_index] returns the portion from the beginning of the list till end\_index (exclusive)

1. Simplified Comprehension

You should support the following form [**for** *val* **in** *list* **if** *condition*]. It defines a new list containing a subset of the elements in the original list satisfying the condition. Only lists of integers should be supported.

Conditions are restricted to the form: operand1 op operand2 where op is a comparison operator (==, !=, <, <=, >, >=) and each of the operands is either an integer or *val*. You should also support ‘and’, ‘or’, and ‘not’.

# Assignment Description

Write a grammar that recognizes the statements described above and generates its lexical analyzer and parser. After obtaining the lexical analyzer and the parser, write all the action routines needed to evaluate a given python code.

# Deliverables

* Grammar file(s)
* Action routines
* Batch file(s) containing all the scripts needed to run your code
* Any other files/libraries required to run the batch file(s)

**Below is some input code followed by the expected output:**

L1 = ['hello', 'everybody', 'from', 'aub'] print(L1)

L2 = ['hello', 55, 'from', L1] print(L2)

L2[2] = 'to' print(L2)

L3 = ['333', 33, 3] print(L3)

L4 = ['444', 44, 4] print(L4)

L3 = L1 + L2 print(L3)

L5 = L1 + L2 + L3 + L4 print(L5)

L6 = L5[3:7] print(L6)

L7 = L5[:6] print(L7)

L8 = L5[3:] print(L8)

L9 = [1, 2, 3, 4, 5, 6, 7, 8, 9]

c1=[for x in L9 if (x > 4)] print(c1)

c2=[for x in L9 if (5 == 2)] print(c2)

c3=[for x in L9 if (5 > x)] print(c3)

c4=[for x in L9 if (x == x)] print(c4)

c5=[for x in L9 if not (x == 4)] print(c5)

c6=[for x in L9 if (x != 4)] print(c6)

c7=[for y in L9 if (x != 4)] print(c7)

c8=[for x in L9 if (7 != y)] print(c8)

c10=[for x in L9 if ( ( ((x > 2) and (7 > x)) or (x == 9) ) and (x > 5) )] print(c10)

c11=[for x in L9 if ( ( ((x > 2) and (7 > x)) or not(x == 9) ) and (x > 5) )] print(c11)

c12=[for x in L9 if ( ( not ((x > 2) and (7 > x)) or not(x == 9) ) and (x > 5) ) ] print(c12)

**Output:**

L1 is ['hello', 'everybody', 'from', 'aub']

L2 is ['hello', 55, 'from', L1]

L2 is ['hello', 55, 'to', L1]

L3 is ['333', 33, 3]

L4 is ['444', 44, 4]

L3 is ['hello', 'everybody', 'from', 'aub', 'hello', 55, 'to', L1]

L5 is ['hello', 'everybody', 'from', 'aub', 'hello', 55, 'to', L1, 'hello', 'everybody', 'from', 'aub', 'hello', 55, 'to', L1, '444', 44, 4]

L6 is ['aub', 'hello', 55, 'to']

L7 is ['hello', 'everybody', 'from', 'aub', 'hello', 55]

L8 is ['aub', 'hello', 55, 'to', L1, 'hello', 'everybody', 'from', 'aub', 'hello', 55, 'to', L1, '444', 44]

c1 is [5, 6, 7, 8, 9]

c2 is []

c3 is [1, 2, 3, 4]

c4 is [1, 2, 3, 4, 5, 6, 7, 8, 9]

c5 is [1, 2, 3, 5, 6, 7, 8, 9]

c6 is [1, 2, 3, 5, 6, 7, 8, 9]

Unknown variable x. Did you mean y

Unknown variable x. Did you mean y

Unknown variable x. Did you mean y

Unknown variable x. Did you mean y

Unknown variable x. Did you mean y

Unknown variable x. Did you mean y

Unknown variable x. Did you mean y

Unknown variable x. Did you mean y

Unknown variable x. Did you mean y

c7 is []

Unknown variable y. Did you mean x

Unknown variable y. Did you mean x

Unknown variable y. Did you mean x

Unknown variable y. Did you mean x

Unknown variable y. Did you mean x

Unknown variable y. Did you mean x

Unknown variable y. Did you mean x

Unknown variable y. Did you mean x

Unknown variable y. Did you mean x

c8 is []

c10 is [6, 9]

c11 is [6, 7, 8]

c12 is [6, 7, 8, 9]