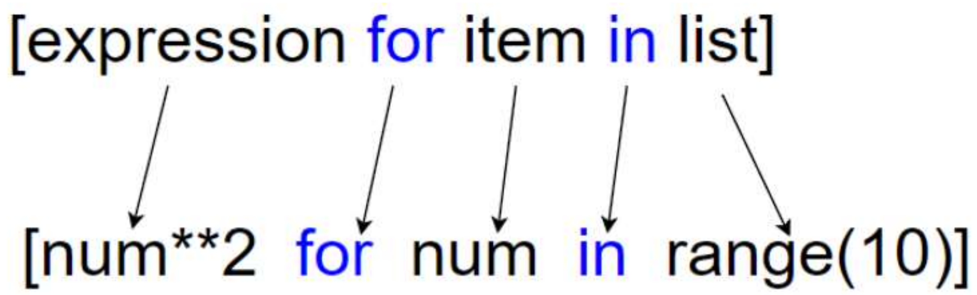
DATE : 24 june 2024

DAY : Monday

TOPICS : List Comprehension and Dictionary Comprehension

LIST COMPREHENSION

- List Comprehensions provide an elegant way to create new lists.
- It consists of brackets containing an expression followed by a for clause, then zero or more for or if clauses.



```
mystring = "WELCOME"
mylist = [ i for i in mystring ] # Iterating through a string Using List Comprehension
mylist
```

```
['W', 'E', 'L', 'C', 'O', 'M', 'E']
```

```
l1 = []
for i in mystring:
  l1.append(i)
print(l1)
```

```
['W', 'E', 'L', 'C', 'O', 'M', 'E']
```

```
l2 = [num**2 for num in range(10) if num%2==0]
print(l2)
```

```
[0, 4, 16, 36, 64]
```

```
mylist1 = [ i for i in range(40) if i % 2 == 0] # Display all even numbers between 0 and 40
mylist1
```

```
[0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38]
```

```
mylist2 = [ i for i in range(40) if i % 2 == 1] # Display all odd numbers between 0 and 40
mylist2
```

```
[1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39]
```

```
mylist3 = [num**2 for num in range(10)] # calculate square of all numbers between 0 and 10
mylist3
```

```
[0, 1, 4, 9, 16, 25, 36, 49, 64, 81]
```

```
# Multiple whole list by 10
list1 = [2,3,4,5,6,7,8]
list1 = [i*10 for i in list1]
list1
```

```
[20, 30, 40, 50, 60, 70, 80]
```

```
#List all numbers divisible by 3 , 9 & 12 using nested "if" with List Comprehensi
mylist4 = [i for i in range(200) if i % 3 == 0 if i % 9 == 0 if i % 12 == 0]
mylist4
```

```
[0, 36, 72, 108, 144, 180]
```

```
# Odd even test
l1 = [print("{} is Even Number".format(i)) if i%2==0 else print("{} is odd number".format(i))]
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
<ipython-input-7-db8423127f98> in <cell line: 2>()
      1 # Odd even test
----> 2 l1 = [print("{} is Even Number".format(i)) if i%2==0 else print("{} is odd number".format(i))]

NameError: name 'i' is not defined
```

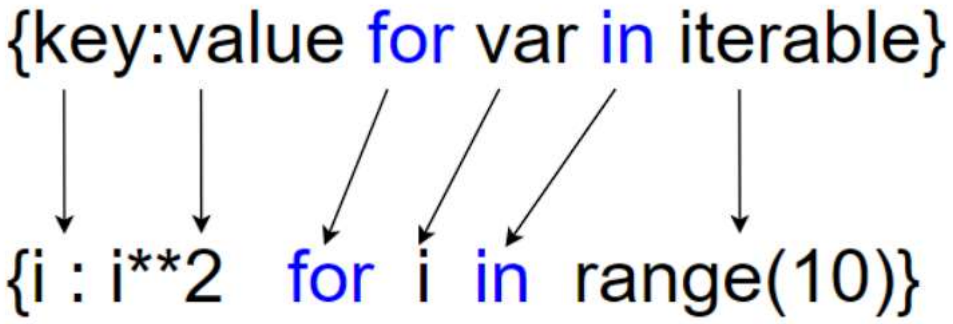
```
# Extract numbers from a string
mystr = "One 1 two 2 three 3 four 4 five 5 six 6789"
numbers = [i for i in mystr if i.isdigit()]
numbers
```

```
['1', '2', '3', '4', '5', '6', '7', '8', '9']
```

```
# Extract letters from a string
mystr = "One 1 two 2 three 3 four 4 five 5 six 6789"
numbers = [i for i in mystr if i.isalpha()]
numbers
```

```
['O',
 'n',
 'e',
 't',
 'w',
 'o',
 't',
 'h',
 'r',
 'e',
 'e',
 'f',
 'o',
 'u',
 'r',
 'f',
 'i',
 'v',
 'e',
 's',
 'i',
 'x']
```

DICTIONARY COMPREHENSION


{key:value for var in iterable}
{i : i**2 for i in range(10)}

```
double = {i:i*2 for i in range(10)} #double each value using dict comprehension
double
```

```
{0: 0, 1: 2, 2: 4, 3: 6, 4: 8, 5: 10, 6: 12, 7: 14, 8: 16, 9: 18}
```

```
square = {i:i**2 for i in range(10)}
square
```

```
{0: 0, 1: 1, 2: 4, 3: 9, 4: 16, 5: 25, 6: 36, 7: 49, 8: 64, 9: 81}
```

```
key = ['one' , 'two' , 'three' , 'four' , 'five']
value = [1,2,3,4,5]
mydict = {k:v for (k,v) in zip(key,value)} # using dict comprehension
mydict
```

```
{'one': 1, 'two': 2, 'three': 3, 'four': 4, 'five': 5}
```

```
list(zip(key,value))
```

```
[('one', 1), ('two', 2), ('three', 3), ('four', 4), ('five', 5)]
```

```
mydict1 = {'a':10 , 'b':20 , 'c':30 , 'd':40 , 'e':50}
mydict1 = {k:v/10 for (k,v) in mydict1.items()} # Divide all values in a dictionary by 10
mydict1
```

```
{'a': 1.0, 'b': 2.0, 'c': 3.0, 'd': 4.0, 'e': 5.0}
```

```
str1 = "Natural Language Processing"
mydict2 = {k:v for (k,v) in enumerate(str1)} # Store enumerated values in a dictionary
mydict2
```

```
{0: 'N',
 1: 'a',
 2: 't',
 3: 'u',
 4: 'r',
 5: 'a',
 6: 'l',
 7: ' ',
 8: 'L',
 9: 'a',
 10: 'n',
 11: 'g',
 12: 'u',
 13: 'a',
 14: 'g',
 15: 'e',
 16: ' ',
 17: 'P',
 18: 'r',
 19: 'o',
 20: 'c',
 21: 'e',
 22: 's',
 23: 's',
 24: 'i',
 25: 'n',
 26: 'g'}
```

```
str1 = "abcdefghijklmnopqrstuvwxyz"
mydict3 = {i:i.upper() for i in str1} # Lower to Upper Case
mydict3
```

```
{'a': 'A',
 'b': 'B',
 'c': 'C',
 'd': 'D',
 'e': 'E',
 'f': 'F',
 'g': 'G',
 'h': 'H',
 'i': 'I',
 'j': 'J',
 'k': 'K',
 'l': 'L',
 'm': 'M',
 'n': 'N',
 'o': 'O',
 'p': 'P',
 'q': 'Q',
 'r': 'R',
 's': 'S',
 't': 'T',
 'u': 'U',
 'v': 'V',
 'w': 'W',
 'x': 'X',
 'y': 'Y',
 'z': 'Z'}
```

Start coding or generate with AI.