

Comprehension

Comprehension contains very compact code usually a single statement that perform a task.

- List Comprehension
- Set Comprehension
- Dictionary Comprehension

List Comprehension

List comprehension represents creation of new list from an iterable object that satisfy a given condition.

Syntax:-

```
new_list = [expression for item in iterable_object if_statement]
```

There can be zero or more If Statements.

There can be one or multiple for loops.

Ex:-

```
lst1 = [i+1 for i in range(20)]
```

```
lst2 = [i for i in range(20) if i%2==0]
```

```
lst3 = [i for i in range(11) if i%2==0 if i%3==0]
```



Nested If statement

List Comprehension

- List Comprehension with If else Statement

Syntax:-

`new_list = [expression if _statement else expression for item in iterable_object]`

Ex:-

`new_list = [i if i%2==0 else "Invalid" for i in range(10)]`

Nested List Comprehension

```
lst = [ [i*j for j in range(4,7)] for i in range(6,8) ]
```



Inner for loop

A blue rectangular box containing the text "Inner for loop". A blue arrow points vertically upwards from the top center of the box to the inner loop part of the code above, specifically pointing to the `for j in range(4,7)` section.



Outer for loop

A blue rectangular box containing the text "Outer for loop". A blue arrow points diagonally upwards and to the left from the top center of the box to the outer loop part of the code above, specifically pointing to the `for i in range(6,8)` section.

Set Comprehension

Set comprehension represents creation of new set from an iterable object that satisfy a given condition.

Syntax:-

`new_set = {expression for item in iterable_object if_statement}`

There can be zero or more If Statements.

There can be one or multiple for loops.

Ex:-

`set1 = {i+1 for i in range(20)}`

`set2 = {i for i in range(20) if i%2==0}`

`set3 = {i for i in range(11) if i%2==0 if i%3==0}`

Set Comprehension

- Set Comprehension with If else Statement

Syntax:-

new_set= {expression if_statement else expression *for* item *in* iterable_object}

Ex:-

new_set = {i *if* i%2==0 *else* i*1000 *for* i *in* range(10)}

Nested Set Comprehension

`st = {(l, j) for j in range(4,7) for i in range(6,8)}`

Dictionary Comprehension

Dictionary comprehension represents creation of new Dictionary from an iterable object that satisfy a given condition.

Syntax:-

```
new_dict = {expression(variable):expression(variable) for variable,variable in
iterable_object if _statement }
```

There can be zero or more If Statements.

There can be one or multiple for loops.

Ex:-

```
dict1 = {k:v for k, v in lst}
```

```
dict2 = {n:n*2 for n in range(10)}
```

```
dict3 = {n:n*2 for n in range(20) if n%2==0}
```

```
dict4 = {n:n*2 for n in range(20) if n%2==0 if n%3==0}
```


Dictionary Comprehension

- Comprehension with If else Statement

Syntax:-

```
new_dict = {expression(variable): (expression if_statement else expression)  
for variable in iterable_object}
```

Ex:-

```
new_dict = {i :(“even” if i%2==0 else “Invalid” for i in range(10))}
```