

```
1: import asyncio
2:
3:
4: class AsyncOpen:
5:     def __init__(self, f, m):
6:         self.fp = open(f, m)
7:
8:     async def __aenter__(self):
9:         return self
10:
11:     async def read(self):
12:         return self.fp.read()
13:
14:     async def __aexit__(self, *args, **kwargs):
15:         self.fp.close()
16:
17: class ExampleClass:
18:     def __init__(self, name):
19:         self.name = name
20:
21:     async def async_method(self):
22:         async with AsyncOpen('file.txt', 'r') as f:
23:             return await f.read()
24:
25: # Constants, Lists, Tuples, Sets, Dicts
26: x = [1, 2, 3] # ast.List
27: y = (1, 2, 3) # ast.Tuple
28: z = {1, 2, 3} # ast.Set
29: w = {'a': 1, 'b': 2} # ast.Dict
30:
31: # Starred, UnaryOp, BinOp, Compare
32: *rest, = x # ast.Starred in unpacking
33: not_x = not x # ast.UnaryOp
34: sum_xy = x[0] + y[1] # ast.BinOp
35: comparison = x[0] < y[1] # ast.Compare
36:
37: # Call, IfExp, Attribute, NamedExpr, Subscript, Slice
38: result = len(x) # ast.Call
39: max_value = x[0] if x[0] > y[0] else y[0] # ast.IfExp
40: attribute_access = result.bit_length() # ast.Attribute
41: if (n := len(x)) > 2: # ast.NamedExpr
42:     print(f"List is longer than 2, length is {n}")
43: list_slice = x[1:2] # ast.Subscript with ast.Slice
44:
45: # SetComp, GeneratorExp, DictComp
46: set_comp = {i*2 for i in x} # ast.SetComp
47: generator_exp = (i*2 for i in x) # ast.GeneratorExp
48: dict_comp = {i: i*2 for i in x} # ast.DictComp
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49:
50: # Comprehension, Assign, AnnAssign, AugAssign
51: comprehension = [i for i in x if i > 1] # ast.comprehension in ListComp
52: x[0] = 10 # ast.Assign
53: count: int = 0 # ast.AnnAssign
54: count += 1 # ast.AugAssign
55:
56: # For, AsyncFor, With, AsyncWith, FunctionDef, Lambda, YieldFrom, Await, ClassDef
57: async def async_loop(items): # ast.AsyncFor
58:     async for item in items:
59:         print(item)
60:
61: async def async_read(file): # ast.AsyncWith
62:     async with AsyncOpen(file, 'r') as f:
63:         return await f.read() # ast.Await
64:
65: def function_def(x, y): # ast.FunctionDef
66:     return x + y
67:
68: lambda_func = lambda x, y: x + y # ast.Lambda
69:
70: def generator_func(): # ast.YieldFrom
71:     yield from range(10)
72:
73: # Using ExampleClass
74: example_instance = ExampleClass("Example")
75:
76: # Call the function
77: function_result = function_def(5, 3)
78:
79: # Use the lambda
80: lambda_result = lambda_func(2, 3)
81:
82: # Instantiate the class and call a method
83: example_instance = ExampleClass("Example")
84:
85: # Asynchronous operations require running an event loop
86: async def run_async_operations(file):
87:     # Call the async method
88:     async_result = await example_instance.async_method()
89:
90:     async def items():
91:         yield 1
92:         yield 2
93:         yield 3
94:
95:     # Call the async loop
96:     await async_loop(items())
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97:
98:     # Call async_read
99:     async_read_result = await async_read('file.txt')
100:
101: # Multiplication with sequences
102: sequence_multiplication = [1, 2, 3] * 2 # Repeats the list
103:
104: # Modulus for formatting strings
105: name = "World"
106: formatted_string = "Hello, %s!" % name # Old-style string formatting
107:
108: # ast.In for membership tests
109: item = 2
110: container = [1, 2, 3, 4, 5]
111: membership_test = item in container # This will use ast.Compare with ast.In
112: print(f"Item in container: {membership_test}")
113:
114: # A more complex example of kwargs with a function that calculates an operation
115: def calculate_operation(x, y, operation='add'):
116:     if operation == 'add':
117:         return x + y
118:     elif operation == 'subtract':
119:         return x - y
120:     elif operation == 'multiply':
121:         return x * y
122:     elif operation == 'divide':
123:         return x / y
124:     else:
125:         return "Unknown operation"
126:
127: # Calling the function with kwargs
128: result_add = calculate_operation(x=5, y=3, operation='add')
129:
130: result_multiply = calculate_operation(x=5, y=3, operation='multiply')
131:
132: # Assigning to a slice of a list
133: numbers = [0, 0, 0, 0, 0] # A list of five zeros
134:
135: # Replace a slice of the list with new values
136: numbers[1:4] = [1, 2, 3] # This modifies the list in place
137:
138: # Unary operation for negation
139: negative_number = -10
```