

# Python Tutor: Visualize code in Python, JavaScript, C, C++, and Java

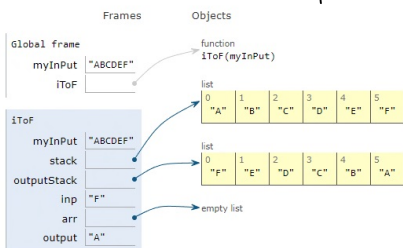
FIFO

```
Python 3.6
(known limitations)

1 myInPut = 'ABCDEF'
2
3 def iToF(myInPut):
4     stack=[]
5     outputStack=[]
6
7     for inp in myInPut:
8
9         stack.append(inp)
10        arr=stack.copy()
11
12    while stack:
13
14        output=arr.pop()
15        outputStack.append(output)
16
17    return output
18
19 print(iToF(myInPut))
```

[Edit this code](#)

⇒ line that just executed  
→ next line to execute



Stack 0

Add	Arr
0	A

Add	Arr
1	B
0	A

Add	Arr
2	C
1	B
0	A

Add	Arr
3	D
2	C
1	B
0	A

Add	Arr
4	E
3	D
2	C
1	B
0	A

Add	Arr
5	F
4	E
3	D
2	C
1	B
0	A

Stack 0

Add	Arr
4	E
3	D
2	C
1	B
0	A

Add	Arr
3	D
2	C
1	B
0	A

Add	Arr
2	C
1	B
0	A

Add	Arr
1	B
0	A

Add	Arr
0	A

Stack 1

Add	Arr
0	F

Add	Arr
1	E
0	F

Add	Arr
2	D
1	E
0	F

Add	Arr
3	C
2	D
1	E
0	F

Add	Arr
4	B
3	C
2	D
1	E
0	F

Add	Arr
5	A
4	B
3	C
2	D
1	E
0	F

# Python Tutor: Visualize code in Python, JavaScript, C, C++, and Java

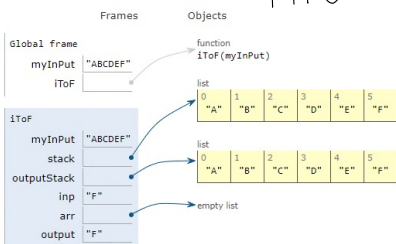
PIFO

```
Python 3.6
(known limitations)

1 myInPut = 'ABCDEF'
2
3 def iToF(myInPut):
4     stack=[]
5     outputStack=[]
6
7     for inp in myInPut:
8
9         stack.append(inp)
10        arr=stack.copy()
11
12    while stack:
13
14        output=arr.pop(0)
15        outputStack.append(output)
16
17    return output
18
19 print(iToF(myInPut))
```

[Edit this code](#)

⇒ line that just executed  
→ next line to execute



Stack 0

Add	Arr
0	A

Add	Arr
1	B
0	A

Add	Arr
2	C
1	B
0	A

Add	Arr
3	D
2	C
1	B
0	A

Add	Arr
4	E
3	D
2	C
1	B
0	A

Add	Arr
5	F
4	E
3	D
2	C
1	B
0	A

Stack 0

Add	Arr
4	F
3	E
2	D
1	C
0	B

Add	Arr
3	F
2	E
1	D
0	C

Add	Arr
2	F
1	E
0	B

Add	Arr
1	F
0	E

Add	Arr
0	F

Stack 1

Add	Arr
0	A

Add	Arr
1	B
0	A

Add	Arr
2	C
1	B
0	A

Add	Arr
3	D
2	C
1	B
0	A

Add	Arr
4	E
3	D
2	C
1	B
0	A

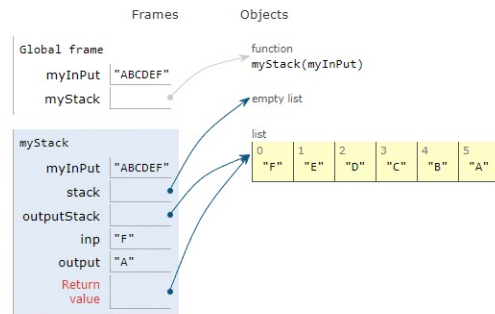
Add	Arr
5	F
4	E
3	D
2	C
1	B
0	A

Python 3.6  
(known limitations)

```
1 myInPut = 'ABCDEF'
2
3 def myStack(myInPut):
4     stack=[]
5     outputStack=[]
6
7     for inp in myInPut:
8
9         stack.append(inp)
10
11     while stack:
12
13         output=stack.pop()
14         outputStack.append(output)
15
16     return outputStack
17
18 print(myStack(myInPut))
```

[Edit this code](#)

Print output (drag lower right corner to resize)



Stack 0

Add	Arr
0	A

Add	Arr
1	B
0	A

Add	Arr
2	C
1	B
0	A

Add	Arr
3	D
2	C
1	B
0	A

Add	Arr
4	E
3	D
2	C
1	B
0	A

Add	Arr
5	F
4	E
3	D
2	C
1	B
0	A

Stack 0

Add	Arr
4	E
3	D
2	C
1	B
0	A

Add	Arr
3	D
2	C
1	B
0	A

Add	Arr
2	C
1	B
0	A

Add	Arr
1	B
0	A

Add	Arr
0	A

Stack 1

Add	Arr
0	F

Add	Arr
1	E
0	F

Add	Arr
2	D
1	E
0	F

Add	Arr
3	C
2	D
1	E
0	F

Add	Arr
4	B
3	C
2	D
1	E
0	F

Add	Arr
5	A
4	B
3	C
2	D
1	E
0	F

```
main.py
1 Operators = set(['+', '-', '*', '/', '(', ')'])
2
3 myInPut = 'A*B'
4
5 def iToI(myInPut):
6     stack=[]
7     output=''
8
9     for inp in myInPut:
10
11         if inp == '(':
12             stack.append('(')
13
14         elif inp == ')':
15             while stack[-1] != '(':
16                 output = output+stack.pop()
17             stack.pop()
18
19         elif inp not in Operators:
20             output = output+inp
21
22         elif inp == '+' or '-' and stack and stack[-1] != '(' and stack and stack[-1] == '*' and '/' and '+' and '-':
23             while stack and stack[-1] != '(':
24                 output = output+stack.pop()
25             stack.append(inp)
26
27         elif inp == '-' or '+' and stack and stack[-1] != '(' and stack and stack[-1] == '*' and '/' and '+' and '-':
28             while stack and stack[-1] != '(':
29                 output = output+stack.pop()
30             stack.append(inp)
31
32         elif inp == '*' or '/' and stack and stack[-1] != '(' and stack and stack[-1] == '+' and '-':
33             stack.append(inp)
34
35         elif inp == '/' or '*' and stack and stack[-1] != '(' and stack and stack[-1] == '+' and '-':
36             stack.append(inp)
37
38     while stack:
39         output+=stack.pop()
40
Input
AB*
...Program finished with exit code 0
Press ENTER to exit console.
```

```
main.py
1 Operators = set(['+', '-', '*', '/', '(', ')'])
2
3 myInPut = 'A-B'
4
5 def iToI(myInPut):
6     stack=[]
7     output=''
8
9     for inp in myInPut:
10
11         if inp == '(':
12             stack.append('(')
13
14         elif inp == ')':
15             while stack[-1] != '(':
16                 output = output+stack.pop()
17             stack.pop()
18
19         elif inp not in Operators:
20             output = output+inp
21
22         elif inp == '+' or '-' and stack and stack[-1] != '(' and stack and stack[-1] == '*' and '/' and '+' and '-':
23             while stack and stack[-1] != '(':
24                 output = output+stack.pop()
25             stack.append(inp)
26
27         elif inp == '-' or '+' and stack and stack[-1] != '(' and stack and stack[-1] == '*' and '/' and '+' and '-':
28             while stack and stack[-1] != '(':
29                 output = output+stack.pop()
30             stack.append(inp)
31
32         elif inp == '*' or '/' and stack and stack[-1] != '(' and stack and stack[-1] == '+' and '-':
33             stack.append(inp)
34
35         elif inp == '/' or '*' and stack and stack[-1] != '(' and stack and stack[-1] == '+' and '-':
36             stack.append(inp)
37
38     while stack:
39         output+=stack.pop()
40
Input
AB-
...Program finished with exit code 0
Press ENTER to exit console.
```

```
main.py
1 Operators = set(['+', '-', '*', '/', '(', ')'])
2
3 myInPut = 'A*B'
4
5 def iToF(myInPut):
6     stack = []
7     output = ''
8
9     for inp in myInPut:
10
11         if inp == '(':
12             stack.append('(')
13
14         elif inp == ')':
15             while stack[-1] != '(':
16                 output = output + stack.pop()
17             stack.pop()
18
19         elif inp not in Operators:
20             output = output + inp
21
22         elif inp == '+' or '-' and stack and stack[-1] != '(':
23             while stack and stack[-1] != '(':
24                 output = output + stack.pop()
25             stack.append(inp)
26
27         elif inp == '-' or '+' and stack and stack[-1] != '(':
28             while stack and stack[-1] != '(':
29                 output = output + stack.pop()
30             stack.append(inp)
31
32         elif inp == '*' or '/' and stack and stack[-1] != '(':
33             while stack and stack[-1] != '(':
34                 output = output + stack.pop()
35             stack.append(inp)
36
37         elif inp == '/' or '*' and stack and stack[-1] != '(':
38             while stack and stack[-1] != '(':
39                 output = output + stack.pop()
40             stack.append(inp)
41
42     while stack:
43         output = output + stack.pop()
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```
main.py
1 Operators = set(['+', '-', '*', '/', '(', ')'])
2
3 myInPut = '(A+B)*C'
4
5 def iToI(myInPut):
6     stack=[]
7     output=''
8
9     for inp in myInPut:
10
11         if inp == '(':
12             stack.append('(')
13
14         elif inp == ')':
15             while stack[-1] != '(':
16                 output = output+stack.pop()
17             stack.pop()
18
19         elif inp not in Operators:
20             output = output+inp
21
22         elif inp == '+' or '-' and stack and stack[-1] != '(': and stack and stack[-1] == '*' and '/' and '+' and '-':
23             while stack and stack[-1] != '(':
24                 output = output+stack.pop()
25             stack.append(inp)
26
27         elif inp == '-' or '+' and stack and stack[-1] != '(': and stack and stack[-1] == '*' and '/' and '+' and '-':
28             while stack and stack[-1] != '(':
29                 output = output+stack.pop()
30             stack.append(inp)
31
32         elif inp == '*' or '/' and stack and stack[-1] != '(': and stack and stack[-1] == '+' and '-':
33             stack.append(inp)
34
35         elif inp == '/' or '*' and stack and stack[-1] != '(': and stack and stack[-1] == '+' and '-':
36             stack.append(inp)
37
38     while stack:
39         output+=stack.pop()
40
input
AB+C*
...Program finished with exit code 0
Press ENTER to exit console.
```

```
main.py
1 Operators = set(['+', '-', '*', '/', '(', ')'])
2
3 myInPut = 'A*(B+C)'
4
5 def iToI(myInPut):
6     stack=[]
7     output=''
8
9     for inp in myInPut:
10
11         if inp == '(':
12             stack.append('(')
13
14         elif inp == ')':
15             while stack[-1] != '(':
16                 output = output+stack.pop()
17             stack.pop()
18
19         elif inp not in Operators:
20             output = output+inp
21
22         elif inp == '+' or '-' and stack and stack[-1] != '(': and stack and stack[-1] == '*' and '/' and '+' and '-':
23             while stack and stack[-1] != '(':
24                 output = output+stack.pop()
25             stack.append(inp)
26
27         elif inp == '-' or '+' and stack and stack[-1] != '(': and stack and stack[-1] == '*' and '/' and '+' and '-':
28             while stack and stack[-1] != '(':
29                 output = output+stack.pop()
30             stack.append(inp)
31
32         elif inp == '*' or '/' and stack and stack[-1] != '(': and stack and stack[-1] == '+' and '-':
33             stack.append(inp)
34
35         elif inp == '/' or '*' and stack and stack[-1] != '(': and stack and stack[-1] == '+' and '-':
36             stack.append(inp)
37
38     while stack:
39         output+=stack.pop()
40
input
ABC+*
...Program finished with exit code 0
Press ENTER to exit console.
```