

# callback

April 18, 2023

This file is part of CasADi.

CasADi -- A symbolic framework for dynamic optimization.  
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```
[1]: from casadi import *
```

## 1 A simple case of Callback

Callback allows the user to create functions that can be embedded into CasADi expressions. The user creates a class that inherits from this class and implements a subset of the virtual methods. Although Callback itself is implemented in C++, the virtual methods can be implemented in Python or MATLAB thanks to cross-language polymorphism as supported by the SWIG framework.

```
[2]: class Fac(Callback):  
    def __init__(self, name, opts={}):  
        Callback.__init__(self)  
        self.construct(name, opts)  
  
    def get_n_in(self): return 1  
    def get_n_out(self): return 1
```

```
def eval(self, arg):  
    x = arg[0]  
    y = 1  
    for i in range(int(x)):  
        y*=i+1  
    return [y]
```

```
[3]: fac = Fac('fac')
```

```
[4]: # Evaluate numerically  
y = fac(4)
```

```
[5]: print("4! = ", y)
```

4! = 24

## 2 Using the function in a graph

```
[6]: x = MX.sym("x")  
y = fac(x)
```

```
[7]: f = Function('f', [x],[y])
```

```
[8]: y = f(5)
```

```
[9]: print("5! = ", y)
```

5! = 120