

# SWIG

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# Installation

```
sudo apt-get -y install libpcre3-dev byacc yodl
git clone --depth 1 https://github.com/swig/swig.git
./autogen.sh
./configure --prefix=/place/for/swig # or default: /
    usr/local/share
make -j8 && make install
```

# Wrapping C is Easy:

```
cd wrap_pure_c;  
make  
./say_hello.py
```

# Let's try to wrap some C++ without SWIG

```
cd wrap_cpp_wo_swig;  
make  
./say_hello.py
```

Name mangling is a pain!

Also, note how much the Python interpreter cares about your private methods!

# Using Mangled Symbols in ctypes is Untenable!

Because the C++ type system is richer than ctypes can handle . . .

# SWIG Minimal Working Example

```
cd swig_mwe;
swig_mwe$ make
swig_mwe$ python3
>>> import is_even
>>> dir(is_even)
['__builtins__', '__cached__', '__doc__', '
    __file__', '__loader__', '__name__', '
    __package__', '__spec__', '_is_even', '
    _newclass', '_object', '_swig_getattr', '
    _swig_getattr_nondynamic', '_swig_property', '
    _swig_repr', '_swig_setattr', '
    _swig_setattr_nondynamic', 'is_even']
>>> is_even.is_even(5)
False
```

# SWIG And C++ namespaces

```
cd swig_namespace;  
swig_namespace$ make  
swig_namespace$ python3  
>>> import is_even  
>>> dir(is_even)  
['__builtins__', '__cached__', '__doc__', '  
    __file__', '__loader__', '__name__', '  
    __package__', '__spec__', '_is_even', '  
    _newclass', '_object', '_swig      _getattr',  
    '_swig_getattr_nondynamic', '_swig_property',  
    '_swig_repr', '_swig_setattr', '  
    _swig_setattr_nondynamic', 'is_even']  
>>> is_even.is_even(5)  
False
```



## SWIG and a C++ namespace clash

“If your program utilizes thousands of small deeply nested namespaces each with identical symbol names, well, then you get what you deserve.” –Swig documentation

```
cd swig_namespace_clash
swig_namespace_clash$ make
swig_namespace_clash$ python3 -q
>>> import is_even
>>> dir(is_even)
['__builtins__', '__cached__', '__doc__', '__file__', '__loader__', '__name__', '__package__', '__spec__', '_is_even', '_newclass', '_object', '_swig_getattr', '_swig_getattr_nondynamic', '_swig_property', '_swig_repr', '_swig_setattr', '_swig_setattr_nondynamic', 'bar_is_even', 'foo_is_even']
>>> is_even.bar_is_even(4)
True
>>> is_even.foo_is_even(4)
True
```