

CSC108H Lecture 23

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Testing with Doctest

To automatically test examples written in docstrings:

- ▶ `import your module m`
- ▶ `import doctest`
- ▶ `doctest.testmod(m)`
- ▶ Careful: trailing spaces in your example output can cause tests to fail
- ▶ Careful: put spaces between list elements: `[1, 2, 3]`

ConceptTest

```
def get_first(lst):  
    '''Return the first element from nonempty lst.  
    '''
```

Which of these examples can be included in the docstring?

▶ A.

```
>>> get_first([1, 2, 3])  
1
```

▶ B.

```
>>> get_first([1])  
1
```

▶ C. Both of the above

▶ D. None of the above

ConcepTest

```
def get_first(lst):  
    '''Remove the first element from nonempty lst.  
    '''
```

Which of these examples can be included in the docstring?

► A.

```
>>> get_first([1, 2, 3])  
1
```

► B.

```
>>> get_first([1])  
1
```

► C. Both of the above

► D. None of the above

ConceptTest

```
def remove_all(lst):  
    '''(list) -> NoneType  
    Remove all elements from lst.  
    '''
```

Which of these examples can be included in the docstring?

▶ A.

```
>>> remove_all([1, 2, 3])  
[]
```

▶ B.

```
>>> remove_all([])  
[]
```

▶ C. Both of the above

▶ D. None of the above

Example: Nested Lists

Add an example to the docstring. Write the function. Test the example automatically. Then give a full test suite.

```
def average_grade(grade_list):  
    ''' (list of [str, int], list) -> float  
    Return the average grade for all the students  
    in grade_list. The inner lists of grade_list contain  
    a student ID and a grade.  
    '''
```

Example: Strings

Add an example to the docstring. Write the function. Test the example automatically. Then give a full test suite.

```
def choose_chars(s1, s2, mask):  
    '''(str, str, str) -> str  
    s1, s2, and mask are all of the same length.  
    mask consists only of characters 0 and 1.  
    Return a string where character i is s1[i] if  
    mask[i] is 0 and s2[i] if mask[i] is 1.  
    '''
```

Example: Dictionaries

Add an example to the docstring. Write the function. Test the example automatically. Then give a full test suite.

```
def to_dict(lst):  
    '''(list of object) -> dict  
    Return a dict whose key/value pairs are the pairs  
    of elements in lst. lst has even length.  
    '''
```


Returning and Modifying Dictionaries

- ▶ When a function returns a dict, do not hard-code the returned dict as the return value
 - ▶ Doctest compares strings, and we can't predict the string of the dict that will be returned
- ▶ Instead, store the returned dict in a variable, and use `==` to compare that variable to the expected dict