

# DocTests

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Testing is the process of running experiments to verify that parts of your program are doing what they are supposed to. As you can imagine, testing is a critical skill in programming. There are many ways to test -- one way is to use appropriate print statements. Functions which take in parameters and return values can be directly tested using a feature called a "doctest".

A doctest is a special command that is written in the comment at the start of a function definition. It allows you to specify what outputs you expect for a certain input. For example imagine we have a function `is_divisible` which tests if a first parameter is divisible by a second. If you pass in 20, 10 this function should return `True`. We can write a doctest by typing `>>>` followed by a call to our function. On the next line you should write the value which is being returned.

```
"""
>>> is_divisible(20, 10)
True
"""
```

Here is a more complete example!

```

"""
Example of using the index variable of a for loop
"""

def main():
    pass

def is_divisible(a, b):
    """
    >>> is_divisible(20, 4)
    True
    >>> is_divisible(12, 7)
    False
    >>> is_divisible(10, 10)
    True
    """
    return a % b == 0

def is_leap_year(year):
    """
    Returns Boolean indicating if given year is a leap year.
    It is a leap year if the year is:
    * divisible by 4, but not divisible by 100
    OR
    * divisible by 400
    Doctests:
    >>> is_leap_year(2001)
    False
    >>> is_leap_year(2020)
    True
    >>> is_leap_year(2000)

```

```
True
>>> is_leap_year(1900)
False
"""

# if the year is divisible by 400, it is a leap year!
if is_divisible(year, 400):
    return True

# other wise its a leap year if its divisible by 4 and not 100
return is_divisible(year, 4) and not is_divisible(year, 100)
```

## Running doctests

You can run doc tests by executing the doctest python module:

```
python -m doctest leap_year.py -v
```

This will run all the tests in leap\_year.py to run the doc tests in another file you would write that file name in place of leap\_year.py.