

# Practice Problem: Even/Odd and Recursive Factorials with Namespaces in C++

CSE3150

## Requirements

1. Create a namespace `CheckUtils` in its own file with:
  - `bool is_even(int n)` returning true if the number is even, false otherwise.
  - `bool is_odd(int n)` returning true if the number is odd, false otherwise.
2. Create another namespace `MathExtras` in its own file with:
  - `int factorial(int n)` that calculates the factorial of `n` using **recursion**.
3. Put declarations into header files and definitions into `.cpp` files.
4. Write a `main.cpp` that:
  - Defines two integers, for example `a = 5` and `b = 6`.
  - Prints whether each is even or odd using `CheckUtils`.
  - Prints the factorial of the first number using `MathExtras`.
5. Place your headers in a folder called `include`, and the `cpp` files in a folder called `src`.

## Test File (`test_check.py`)

```
import subprocess

def run_program():
    result = subprocess.run(
        ["./check_program"], capture_output=True, text=True, check=True
    )
    return result.stdout.strip().splitlines()

def test_checkutils_and_mathextras():
    output = run_program()
    assert "5 is odd" in output[0]
    assert "6 is even" in output[1]
    assert "factorial(5) = 120" in output[2]
```