

# Northeastern University

## CS 2100: Program Design and Implementation 1

### Practice Quiz 1

#### Instructions

- Do not begin the quiz until instructed to do so.
- You may use both sides of a sheet of paper up to 8.5"x11" for reference, but no other resources, including phones, computers, AI, headphones, and ear pods.
- You have until the end of the class period to complete the quiz.
- Students may not leave the classroom during the first 10 minutes of the quiz (except in case of emergency).
- Hand your completed quiz to an instructor before leaving the room.
- Talk to an instructor if you need to leave the room and reenter.

#### Git

You're working on a Python calculator project. You've just finished implementing a `divide()` function in `calculator.py`, and your tests pass locally. You have other local commits that also need to be pushed. What commands are necessary to push your changes to the GitHub repo?

# Functions and Documentation

Please write appropriate documentation for this function:

```
def find_median(numbers: list[Optional[float]]) -> float:
    """

    """

    if len(numbers) == 0:
        raise ValueError("Cannot find median of empty list")
    if None in numbers:
        raise ValueError("List contains None value")

    non_none_numbers: list[float] = [float(num) for num in numbers if num is not None]
    sorted_nums = sorted(non_none_numbers) # built-in sort function
    n = len(sorted_nums)

    if n % 2 == 1: # odd length
        return sorted_nums[n // 2]
    else: # even length
        mid1 = sorted_nums[n // 2 - 1]
        mid2 = sorted_nums[n // 2]
        return (mid1 + mid2) / 2.0
```

# Unit Testing

Please write unit tests for `find_median()`. Make sure to test both `ValueErrors` and both length options (test function signatures are provided).

```
class TestFindMedian(unittest.TestCase):
    """Unit tests for find_median function"""

    def test_odd_length(self) -> None:

    def test_even_length(self) -> None:

    def test_empty_list(self) -> None:

    def test_list_with_none(self) -> None:
```