Lab 2 Task 3 Solution

3) Become familiar with function *main*

1. Where is a *NumberGame* constructed?

   - By observation, we can conclude a *NumberGame* constructed inside function *main*

```python
        def main() -> None:
            ...
            while True:
                g = NumberGame(goal, minimum, maximum, (p1, p2)) #<-Here!!
                winner = g.play()
                print(f'And {winner} is the winner!!!')
                print(p1)
                print(p2)
                again = input('Again? (y/n) ')
                if again != 'y':
                    return


```

2. This function calls *g.play* repeatedly in a loop. What about the game can change each time *g.play* is called: the goal, the min or max move, the players, the moves?

   - By observation, we can conclude that
     1. the goal doesn't change
     2. the min or max move don't change
     3. the current player change as a result of whose_turn method.

```python
            def play(self) -> str:
                ...
                while self.current < self.goal:
                    self.play_one_turn() # <- In here
                ...
                winner = self.whose_turn(self.turn - 1)
                return winner.namePlayers

            def play_one_turn(self) -> None:
                ...
                    next_player = self.whose_turn(self.turn) # <- Here!!
                    amount = next_player.move(
                        self.current,
                        self.min_step,
                        self.max_step,
                        self.goal
                    )
                    self.current += amount
                    self.turn += 1

                    print(f'{next_player.name} moves {amount}.')
                    print(f'Total is now {self.current}.')


                def whose_turn(self, turn: int) -> Player:
                    ...
                    if turn % 2 == 0:
                        return self.players[0]
                    else:
                        return self.players[1]


```

4. the move changes by the *move* method in *play_one_turn*.

```python
                def play(self) -> str:
                    ...
                    while self.current < self.goal:
                        self.play_one_turn()
                    ...
                    winner = self.whose_turn(self.turn - 1)
                    return winner.namePlayers

                def play_one_turn(self) -> None:
                    ...
                    next_player = self.whose_turn(self.turn)
                    amount = next_player.move( # <- Here!!
                        self.current,
                        self.min_step,
                        self.max_step,
                        self.goal
                    )
                    self.current += amount
                    self.turn += 1

                    print(f'{next_player.name} moves {amount}.')
                    print(f'Total is now {self.current}.')


```

3. List all the places in this function where a *Player* is stored, an instance attribute of *Player* is accessed or set, or a method is called on a *Player*.

Rough Work:

We need to find all places in this function where *Player* is stored, where an instance attribute of *Player* is accessed or set, or where a method is called on a *Player*.

1. Find where *Player* is stored.

First, we need to find where *Player* is stored.

Because we know from code that the third argument in *NumberGame* is of type Tuple[Player, Player], we can conclude *Player* is stored inside variables *p1* and *p2*

```python
def main() -> None:
    """Play multiple rounds of a NumberGame based on user input settings.
    """
    goal = int(input('Enter goal amount: '))
    minimum = int(input('Enter minimum move: '))
    maximum = int(input('Enter maximum move: '))
    p1 = make_player('p1') # <- Here!!
    p2 = make_player('p2') # <- Here!!
    while True:
        g = NumberGame(goal, minimum, maximum, (p1, p2)) # <- Here!!
        winner = g.play()
        print(f'And {winner} is the winner!!!')
        print(p1)
        print(p2)
        again = input('Again? (y/n) ')
        if again != 'y':
            return

```

2. Find where the instance attribute of *Player* is accessed or set.
3. Find where a method of *Player* is called.