Tutorial 6

Swinburne University of Technology

Software Testing and Reliability (SWE30009)

Semester 2, 2023

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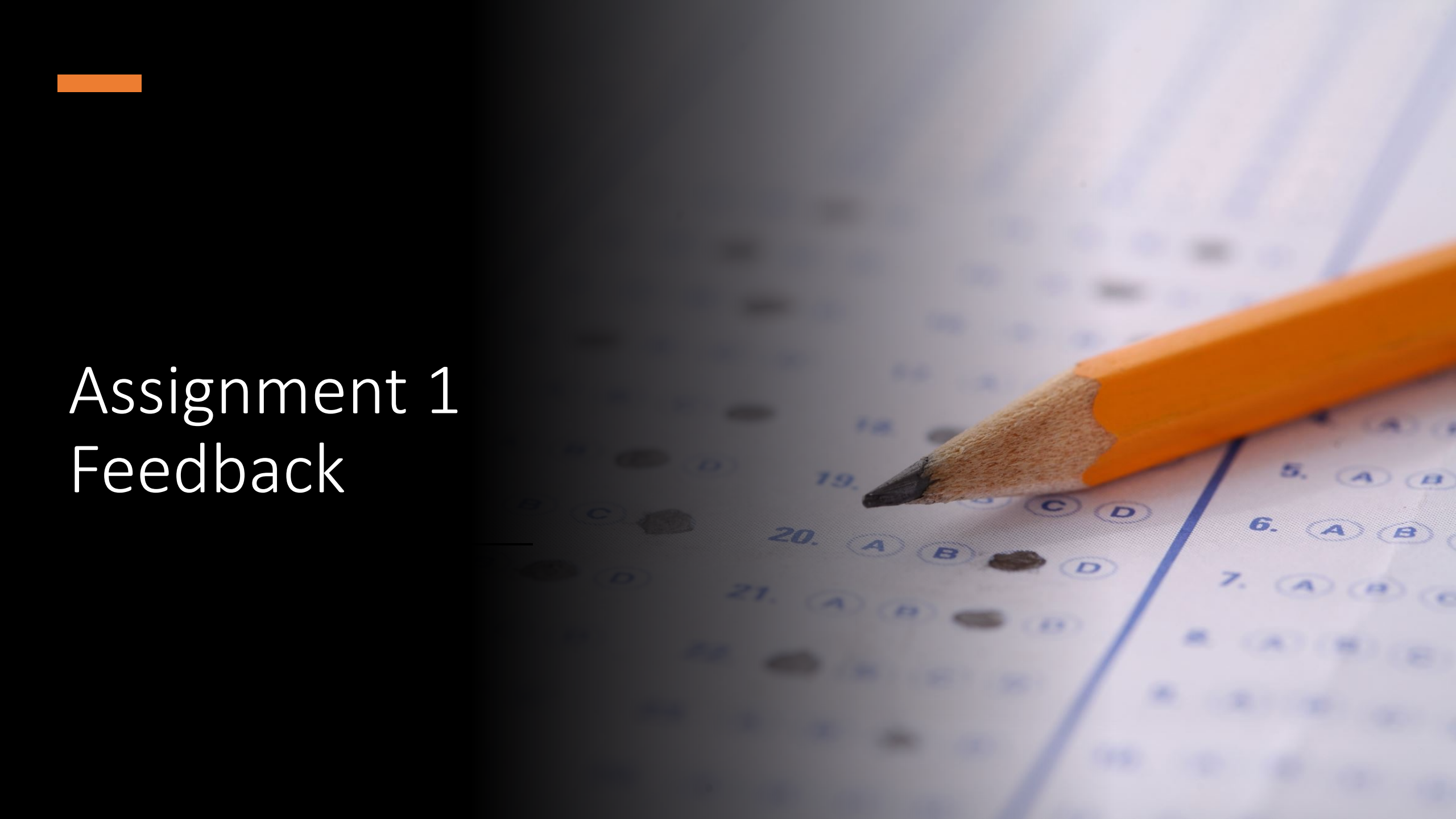
Assignment 1 Feedback



Assignment 2 Q&A

Important notices

- This is an individual assignment.
- Worth 20% of the total unit score.
- Due date: 11:00pm, Monday, 11 Sept 2023.

Program under test

Consider a program which splits an input list of integers into two lists of integers as output according to the following specifications:

- For the input list, the program is expected to accept a non-empty list of not more than 20 positive integers, where integer 0 is not regarded to be positive in this assignment. The input list may contain duplicated integers (that is, the same integer may appear more than once in the input list).
- For the output lists, one of them contains only odd integers in ascending order without duplication of integers, and the other list contains only even integers in ascending order without duplication of integers. Note that one of the output lists may be an empty list for some inputs.

Example test case

Concrete test case

- Input: [3, 10, 9, 20, 16, 10, 9, 15, 7, 5, 28, 20, 5, 8, 20].
- Output: [3, 5, 7, 9, 15] and [8, 10, 16, 20, 28]

Notes

- Input is restricted to contain no more than 20 positive integers.
- Consider valid test case only.
- This program has no test oracle problem.

Task 1

- You are required to construct six valid concrete test cases for this program, which serve for different testing purposes or objectives.
- You must also describe and justify their purposes, and explicitly describe their relevant outputs.

Examples

Test case 1

- Input: [3, 10, 9, 20, 16, 10, 9, 15, 7, 5, 28, 20, 5, 8, 20].
- Output: [3, 5, 7, 9, 15] and [8, 10, 16, 20, 28]
- Objective: This test case contains duplicated integers and hence serve to test the proper removal of duplicated integers.

Test case 2

- Input: [13, 7, 9, 15].
- Output: [7, 9, 13, 15] and [ ]
- Objective: This test case serves to test the scenario that the output list of even integers is empty.

Task 2

- If you can only afford to test your program with one and only one test case, what will be your choice of this single test case among the 6 test cases proposed by you in Task 1?
- Explain and justify your choice.

Task 3

- Test a program given in Appendix using all your test cases in Task 1 and Task 2.
- Note that the program may contain bugs.
- Report the individual test cases and the results, as well as discuss the insights.

Program for Task 3

assignment2.py

```python
def split_and_sort(nums):
    # check if input list length is less than or equal to 20
    if len(nums) > 20:
        return "Error: Input list should not contain more than 20 integers."

    # check if 0 is in the input list
    if 0 in nums:
        return "Error: The number 0 is not a valid input."

    # filter odd and even numbers into two separate lists
    odd_nums = [num for num in nums if num % 2 == 1]
    even_nums = [num for num in nums if num % 2 == 0]

    # remove duplicates and sort
    odd_nums = sorted(odd_nums)
    even_nums = sorted (even_nums)

    return odd_nums, even_nums

nums = [5, 4, 6, 10]
odd_nums, even_nums = split_and_sort(nums)

print("Odd numbers:", odd_nums)
print("Even numbers:", even_nums)
```

assignment2.rb

```ruby
def split_and_sort(nums)
  raise "Error: Input list should not contain more than 20 integers." if nums.length > 20
  raise "Error: The number 0 is not a valid input." if nums.include?(0)

  odd_nums = nums.select { |num| num.odd? }.sort
  even_nums = nums.select { |num| num.even? }.sort

  [odd_nums, even_nums]
end

nums = [5, 4, 6, 10]
odd_nums, even_nums = split_and_sort(nums)
puts "Odd numbers: #{odd_nums}"
puts "Even numbers: #{even_nums}"
```