FALL 2014 GROUP 1

CODE COVERAGE

Twitter Project

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Code Coverage:

Definition:
It is the percentage of code covered in each of the test cases for each iteration.

Formula:
$$\% \text{ of lines covered} = \frac{\text{Number of lines covered}}{\text{Total number of Lines}} \times 100$$

Purpose of Code Coverage:
It is to test out whether the code runs properly and how many test cases have passed and how many have failed. It helps us to fix those parts which are not working.

Parts Tested in Code Coverage:
1. The front end is tested. (TypeScript, HTML5)
2. The back end is tested. (PHP, Server Side)

Front End Code Coverage:

Iteration	Front End Percentage covered			
	# of Test Cases	# Passed	# Failed	% Lines covered
1	5	3	2	55%
2	6	6	0	67.33%
3	8	7	1	100%
(Fixed in 3)	8	8	0	100%
4	9	9	0	100%

Back End Code Coverage:

Iteration	Percentage covered			
	# of Test Cases	# Passed	# Failed	% Lines covered
1	4	4	0	100%
2	6	4	2	66.33%
(Fixed in 2)	6	6	0	100%
3	11	7	4	55.33%
(Fixed in 3)	11	11	0	100%
4	12	11	1	100%

Robustness test cases of program for code coverage:

- Done at the end in iteration 3
- These always included in the # of test cases:
  - Tried to enter a blank screen name
  - Tried to enter an arbitrarily large tweet
  - Tried to use SQL injection in username
- The above was just a sanity check to make sure it worked with multiple people
  - Had 8 people login at once to see if the system slowed down
- These are Robust BVA test cases that deal with the extreme ends of the number of tweets in the database.
  - Robust BVA on the tweet numbers
    - Minimum: 1 (no tweets)
    - Minimum-:0
    - Max: INT_MAX
    - Max: INT_MAX + 1
      - I.e. what happens when the number of tweets exceeds MAX_INT
    - Test INT_MAX against 32 bit machine since Amazon VM is 64 bit
      - Used a Windows XP VM that's 32 bit
      - It didn't work, thought up this test last second
- We tested for cross browser compatibility

To improve robustness:

- Increased quality and quantity of test cases in iterations 1, 2, 3 and 4 to improve overall coverage and make sure the test cases pass
- Prevented empty screen name
- Used prepare statements to query database and prevent SQL injection
- Put a length limit on the tweet

References:

1. *Software Engineering Modern Approaches Second Edition* Eric J. Braude and Michael E. Bernstein, Wiley Publications.
2. B. W. Boehm, J. R. Brown, M. Lipow, *Quantitative Evaluation of Software Quality*, TRW Systems and Energy Group, (1976).