

Software Engineering Group Project Testing Specification

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1. INTRODUCTION

1.1 Purpose of this Document

This document specifies the repeatable tests for the functional requirements for the Buccaneer group project.

1.2 Scope

This document should be read by all members of the group. This covers content from SE.QA.06[2] and the SE.QA.RS-CS22120 requirements document[1]. The document discusses the system tests to be carried out but does not apply to the module tests.

1.3 Objectives

The objective of this document is to produce a set of reproducible system tests to be formally executed against the program to detect errors in the program.

2. TEST TABLE

Test Ref	Req being tested	Test Content	Input	Output	Pass Criteria
SE-01.001	FR1	Check that software prompts user for names of exactly four players on start up	Starting the program	The user is prompted for the names of exactly four players	After starting the program the user is prompted for the names of exactly four players
SE-01.002	FR1	Check that blank inputs are rejected	Leaving an input field blank when prompted for the names of players	Error message stating that names must be given	The system does not let the user proceed until all four names have been entered
SE-01.003	FR1	Check that inputs containing non-letters are rejected	Entering a name containing characters that are not letters	Error message stating that names must contain only letters	The system tells the user that names with special characters are not accepted, and prompts for the name to be given again
SE-01.004	FR1	Check that names with over 20 letters are rejected	Entering a name with over 20 letters	Error message stating that names must contain 20 letters or less	The system tells the user that names with over 20 letters are not accepted, and prompts for the name to be given again
SE-01.004.1	FR1	Check that names with characters 1-20 are accepted	Entering a name with 1-20 characters	The program moves into the next state	The names are correctly accepted
SE-01.005	FR1	Check that names are stored correctly	Entering names of four players	The program moves into the next state	Names are stored correctly
SE-01.006	FR1	Check that game can handle multiple players with the same name	Entering names of four players, two of which are identical	The program moves into the next state	Names are stored correctly

SE-01.007	FR1	Check that users cannot choose the same colour ship	After name of one player is entered, choosing a given colour for their ship	The chosen colour should not be available for other players to choose	Users cannot choose the same colour ship
SE-02.001	FR2	Check that each player is assigned a port	Entering names of four players	Each player is assigned a port	Each player is assigned a port. All four ports are assigned, and no two players have the same port
SE-02.002	FR2	Check that ports are stored correctly	Users are each assigned a port	Each user's port is stored by the program	Ports are stored correctly
SE-02.003	FR2	Check that assignment is random	Repeating SE.02.001 multiple (4) times	Each player is assigned a port at random, each time	Port assignment is random, no obvious pattern is detected
SE-03.001	FR3	Check that pack contains 36 crew cards	The game has started	Program stores correct number of crew cards	Program maintains a pack of 36 crew cards
SE-03.002	FR3	Check that pack contains correct number of each card	The game has started	Program stores correct number of crew cards	Pack contains 6 crew cards of 1, 2, and 3 pirates, in red and black
SE-03.003	FR3	Check that pack is randomly sorted	The game has started (continue running test while playing turns)	Program stores crew cards in random order	Crew cards are stored in random order, no obvious pattern is detected when test is repeated multiple times
SE-03.004	FR3	Check that cards are dealt from the top of the pack	The game has started (continue running test while playing turns)	User is dealt five crew cards	Crew cards are dealt from the top of the pack
SE-04.001	FR4	Check that system maintains pack of 28 chance cards	The game has started	Program stores correct number of chance cards	Program maintains a pack of 28 chance cards
SE-04.002	FR4	Check that pack is randomly sorted	The game has started	Program stores chance cards in random order	Chance cards are stored in random order, no obvious pattern is detected when test is repeated multiple times
SE-05.001	FR5	Check that game contains correct amount of treasure	The game has started	The game contains the correct amount of each type of treasure	There are 20 pieces of treasure – 4 of each type
SE-05.002	FR5	All treasure starts on Treasure Island and is assigned elsewhere where appropriate.	The game has started	Observe that the treasures are correctly distributed.	The treasures are stored on treasure Island and then some are moved to other locations.
SE-05.005	FR5	Check that treasure can be stored on Flat Island.	The game has started	Get another user to go to Flat Island to go and find the treasure.	The user should be able to store treasure on Flat Island.

SE-06.001	FR6	Check that the game stores the number of cards in a user's hand.	The game has started (continue running test while playing turns)	Check the system for the number of cards in the user's hand.	The user's hand should have the same number of cards as the system says there is.
SE-06.002	FR6	Check that the game correctly stores the value of each card.	The game has started (continue running test while playing turns)	Check the system for the values of the different cards in their hand.	The value of the cards in the user's hand should match the values stored in the system.
SE-06.004	FR6	Check that the game can correctly calculate the fighting strength of the player.	The game has started (continue running test while playing turns)	The game should store the strength as the absolute difference between the number of red and black cards in the player's hand.	The correct data should be stored but not shown to the user.
SE-10.001	FR10	Check that the players are given 5 cards from the crew card pack	The game has started	The game should deal 5 crew cards to each player	The game should deal 5 crew cards to each of the four players
SE-10.002	FR10	Check that each trading port is dealt two crew cards	The game has started	The game should deal 2 crew cards to each port	The game should deal 2 crew cards to each of the six ports
SE-10.003	FR10	Check that each trading port is dealt the correct piece of treasure	The game has started	The game should deal the correct piece of treasure to each port to bring the total value of items at the port to 8	The game should know the value of the crew cards at each port and calculate the value of treasure needed to bring the total value of items at the port to 8, then deal the correct piece of treasure to the port
SE-10.004	FR10	Check that the game assigns player's ships to their home ports at the start of the game	The game has started	The player's should see their ships in the correct home port	The test will pass if the ships start the game in the correct home port
SE-06.003	FR6	Check that the game stores the total distance a player can move.	The game has started (continue running test while playing turns)	The game should allow the user to move the correct number of squares (1 square or the sum of all crew cards).	The user should be able to move the correct number of squares across the board.
SE-06.005	FR6	Check that the game can keep track of the chance cards in a player's hand.	The game has started (continue running test while playing turns)	The game should have the chance card stored in the player's hand and it should not be in the pile or in another player's hand.	The system should have the card assigned to the correct player and it shouldn't be present anywhere else in the game.
SE-06.006	FR6	Check that the game can keep track of the treasure on a players ship	The game has started (continue running test while playing turns)	The game should keep track of the treasure stored on a player's ship	The system should be able to assign treasure to a player's ship

SE-06.007	FR7	Check that a player's ship can only contain a maximum of two pieces of treasure	The game has started (continue running test while playing turns)	The game should prevent the player from storing more than two pieces of treasure on their ship	A player can only have a maximum of two pieces of treasure on their ship
SE-06.008	FR6	Check that the game can store and monitor a player's ship location and orientation.	The game has started (continue running test while playing turns)	The game should update its state after each move, correctly storing the ship's location on the board and its orientation.	Check the system after each move, the game should store the correct grid position for the ship.
SE-06.009	FR6	Check that the game can store and monitor the correct information about the player's home port.	The game has started (continue running test while playing turns)	The game should store the treasures kept in the Home Port and their total value should be monitored.	Check that the system correctly stores the value and treasures in the Home Port.
SE-07.001	FR7	Check that the program stores the number of cards at each port and their value	The game has started (continue running test while playing turns)	Program stores number of cards at each port and their value	Correct number of cards at each port and their values are stored by the program
SE-07.002	FR7	Check that the program keeps track of treasure stored at each port	The game has started (continue running test while playing turns)	Program stores type and amount of treasure stored at each port	Correct type and amount of treasure is stored by the program. The program also keeps track of the value of each type of treasure
SE-07.003	FR7	Check that the program associates each port with its owner	The game has started	Program stores names of users and which port they have been assigned	The program keeps track of each ports owner, or, in the case of trading ports, that they have no owner
SE-08.001	FR8	Check that the program stores the number of cards at flat island and their value	The game has started (continue running test while playing turns)	Cards are removed from players hands and stored at flat island	Correct number of cards at flat island and their values are stored by the program
SE-08.002	FR8	Check that the program keeps track of treasure stored at flat island	The game has started (continue running test while playing turns)	Treasure is removed from player and stored at flat island	Correct type and amount of treasure is stored by the program. The program also keeps track of the value of each type of treasure
SE-09.001	FR9	Check that program displays a game board of the correct size	The game has started	A game board of size 20x20 is displayed	Program displays a game board of the correct size
SE-09.002	FR9	Check that program displays board features in the correct places	The game has started	A game board is displayed with the features in the correct places as given by FR9	Program displays a game board with features in correct places

SE-09.003	FR9	Check that the board features are clearly labelled	The game has started	A game board is displayed with correct size and features	Program displays a game board with features that are clearly labelled and distinguishable
SE-09.004	FR9	Check that the position and orientation of each players ship is displayed	The game has started (continue running test while playing turns)	A game board is displayed with each players ship present	Program displays a game board with each player's ship present and distinguishable. The orientation of each ship is also clearly shown
SE-09.005	FR9	Check that player information is correctly displayed	The game has started (continue running test while playing turns)	When it is a player's turn to move, the information specified in FR9 is displayed	Program displays information for each player correctly
SE-09.006	FR9	Check that port information is correctly displayed	The game has started (continue running test while playing turns)	Information for each port is displayed clearly on the game board	Information for each port is displayed clearly on the game board
SE-09.007	FR9	Check that flat island information is correctly displayed	The game has started (continue running test while playing turns)	Items of treasure and amount of crew cards and their value stored at flat island is displayed	Information for flat island is displayed correctly
SE-03.005	FR3	Check that cards are returned to the bottom of the pack	A card is being returned to the pack	Card is returned to the bottom of the pack	Crew cards are returned to the bottom of the pack
SE-03.006	FR3	Check that cards cannot be dealt from an empty pack	User attempts to draw card from empty pack	Program states that crew card pack is empty	Program handles an empty pack of crew cards
SE-04.003	FR4	Check that cards are drawn from the top of the pack	User attempts to draw a chance card	A chance card will be dealt to the player from the top of the pack for them to either hold onto or place back.	The player receives a chance card from the top of the pack.
SE-04.004	FR4	Allow a user to hold onto a chance card.	Draw a chance card which can be held onto and continue playing.	The user is able to keep the chance card for as long as they want, or use it when it is appropriate.	The game lets the user hold onto the chance card.
SE-04.005	FR4	Allow the user to use a chance card in their hand	User chooses to use a chance card in their hand	The game executes the effect of the chance card	The effect of the chance card is executed
SE-04.006	FR4	Check that chance cards that are not able to be held are executed immediately	Draw a chance card that is executed immediately	The effect of the chance card is executed	The effect of the chance card is executed
SE-04.007	FR4	Check that cards are returned to the bottom of the pack	Use a chance card	The chance card is returned to the bottom of the pack	Chance cards are returned to the bottom of the pack

SE-05.003	FR5	Check that treasure can be assigned to ships.	A ship collects some treasure.	The user can store a treasure card on their ship.	The ship is assigned a treasure card.
SE-05.004	FR5	Check that treasure can be assigned to ports.	A ship deposits some treasure at a port.	The port where the treasure was deposited will keep that treasure.	Observe that the treasure has been allocated to the port.
SE-11.001	FR11	Check that the player's take their turn in order according to their home port	The game has started (continue running test while playing turns)	Each player should have their turn in the order of their home port.	The player's turns should go in order of their ports: London, Genoa, Marseilles and then Cadiz.
SE-11.002	FR11	Check that a player can take the correct movement actions during their turn	A player's turn has begun	During each player's turn, they should be able to: Move their ship or turn their ship.	The player must be given the choice of moving forward or turning their ship
SE-11.002.1	FR11	Check that a player cannot move to an incorrect square during their turn	A player's turn has begun. Selects an incorrectly possible square to move to	The player must be informed that the square selected cannot be moved to	The player must not be able to move their ship to the incorrect square
SE-11.003	FR11	Check that the player cannot turn their ship within a port	A player's turn begins in a port	The player shouldn't be able to turn the ship while in a port	The game must not give the option for the user to turn their ship while in a port
SE-11.004	FR11	Check that the game shows all legal movement squares during their turn	The game has started (continue running test while playing turns)	The player should be shown which squares they can move to.	The game should allow a player to move the correct number of squares forward or in any direction within the port
SE-11.005	FR11	Check that the game does not allow the user to move beyond the edge of the board	A player's turn begins facing the edge of the board (within reach)	The player should be shown that they could move up to the edge of the map but no further.	The game should allow a player to only move to the edge of a map but not past it
SE-11.006	FR11	Check that the game does not allow the user to move through islands	A player begins their turn facing an Island and attempts to move through the island	The player should only be able to move up to the square that the Island is on and no further	The game should allow the player to move up to the Island and into it, but no further
SE-11.007	FR11	Check that a player fight's another player if they move to a space occupied by that player.	A player has moved to the same space as another player	The game should begin the attack code which will follow the requirements in FR12	The game should begin the attack and calculate the winner of the fight
SE-11.008	FR11	Check that the game doesn't allow a player to attack another player at a port	A player attempts to move to a port while another player is in the port	The game shouldn't display the port as a legal move position and the user shouldn't be able to share that space with another player	The game shouldn't allow the user to move to that illegal position
SE-11.009	FR11	Check that the game doesn't allow the user to attack another player at the	A player attempts to attack a ship while that ship is on the	The game shouldn't display that position as a legal move position and the user shouldn't be able to share that	The game shouldn't allow the user to move to that illegal position

		coast of Treasure Island	coast of Treasure Island	space with another player	
SE-11.010	FR11	Check that the game gives the opportunity for a player to attack a ship moving through the square they are occupying	A player move over another player.	The game should interrupt the movement of the ship and ask the stationary player if they would like to attack the ship	The game should give the option for the stationary player to attack the moving player, or to let them continue
SE-11.011	FR11	Check that once a stationary player has attacked a moving player, the moving player stops their movement and the attack begins	A stationary player attacks a moving player	The game should allow the ship to be stopped on the square occupied by the stationary ship, and then the attack sequence in FR12 should begin	The game should allow the stationary ship to attack the moving ship, following the same method as for FR12
SE-11.012	FR11	Check that after a move not involving an attack and whilst not in a port, they should be asked which direction they would like to turn to.	A player has moved and not attacked during their turn	The game should ask the user which direction they want to turn to at the end of each turn	The game should allow the user to turn their ship at the end of the turn
SE-11.013	FR11	Check that the user isn't allowed to turn their ship at the end of a turn where they are in a port	A player has moved into a port	The game shouldn't prompt the user to choose a direction to turn to at the end of their turn	The user shouldn't be allowed to change their direction at the end of their turn while in a port
SE-11.014	FR11	Check that the user isn't allowed to turn their ship at the end of a turn where they have attacked someone or been attacked	A player has moved and attacked another player	The game shouldn't give the player who's turn it is the option to turn their ship at the end of their turn	The user shouldn't be able to change their direction at the end of their turn after an attack has occurred
SE-11.015	FR11	Check that the user cannot make an illegal rotation	A player is at the edge of the map and attempts to turn to face the outside of the board	The game shouldn't give the player the choice to turn to face the edge of the map	The player should always be able to take one step forward in their turn.
SE-11.016	FR11	Check that the correct procedures are followed if the player ends their movement in a special position	A player ends their movement adjacent to flat island, treasure island or in a port	The game should follow the sequence in FR13, FR14, FR15 respectively	The user should be presented with the correct sequence of options and choices depending on where they end their movement
SE-12.001	FR12	Check that the game correctly decides who wins in a fight	A player attacks another player	The player with the highest fighting strength should win the fight	The game should compare the fighting strength of the two players and the one with the highest score should win the fight
SE-12.002	FR12	Check that the winner gets the loser's treasure from their ship	A successful attack has taken place.	The player who wins should be allowed to take the treasure from the loser's ship	The game should give the winner the

		given they have any treasure		assuming they have enough room	treasure from the loser's ship
SE-12.003	FR12	Check that any excess treasure from the loser's ship is returned to Treasure Island	Two players attack each other and both have 2 treasures on their ship	The player who wins will not be able to take the treasure from the loser as they won't have any space, so the treasure should be returned to Treasure Island	The game should return any excess loot to Treasure Island from the loser's ship
SE-12.004	FR12	Check that if the loser does not have treasure but does have more than 1 card, then the two lowest value cards should be given to the winner	Two players attack each other and the loser has no treasures and at least two cards	The winner should be given the two lowest value cards from the loser's hand	The game should give the winner the two lowest value cards from the loser's hand
SE-12.005	FR12	Check that if the loser does not have treasure and has only 1 card in their hand that the winner is given that one card	Two players attack each other and the loser has no treasures and 1 card	The winner should be given the 1 remaining card from the loser's hand	The game should give the winner the card from the loser's hand
SE-12.006	FR12	Check that after the cards/treasures have been allocated, the loser is able to make a movement in any direction followed by a change of direction	Two players have attacked each other	The loser should be allowed to move their maximum distance in any direction followed by a change of direction. They must move at least one square	The game should allow the user to move one or more squares in any direction and then change direction
SE-12.007	FR12	Check that the loser cannot move into a port	Two players have attacked each other	The loser should not be able to move into a port after losing a battle	The game should not allow the user to move into a port after losing a battle
SE-12.008	FR12	Check that the winner remains facing the direction they were moving/facing	A player wins an attack	The winner should remain facing their original direction from before the attack	The game shouldn't change the winning ship's orientation
SE-13.001	FR13	Check that card is drawn from top of deck when player arrives at treasure island	Player moves to square adjacent to treasure island	Chance card is drawn from top of deck and given to player	Chance card is drawn from top of deck and given to player
SE-13.002	FR13	Check that chance cards are correctly implemented	Player is given chance card	Chance card behaviour is implemented	The game correctly implements the behaviour of all chance cards
SE-14.001	FR14	Check that player is given crew cards upon reaching flat island	Player moves to square adjacent to flat island	If there are crew cards on flat island, these are given to the player	Player is dealt crew cards upon reaching flat island

SE-14.002	FR14	Check that player is awarded treasure upon reaching flat island	Player with enough room on their ship to hold all the treasure stored on flat island moves to square adjacent to flat island	Treasure on flat island is awarded to player	Player is awarded all treasure on flat island
SE-14.003	FR14	Check that player with room for only one piece of treasure is awarded highest-value treasure on flat island	Player with room for only one piece of treasure moves to square adjacent to flat island	Treasure with highest-value is awarded to player	Player is awarded treasure on flat island with the highest value
SE-14.004	FR14	Check that player with full ship is not awarded treasure	Player with full ship moves to square adjacent to flat island	No treasure is awarded to player	Player is awarded no treasure
SE-15.001	FR15	Check that whenever a player arrives at their home port, all treasure is unloaded	Start the game and put some treasures onto a ship, then have that ship go to the home port	The ships should transfer it's treasures onto the home port	The game should move the treasures assigned to the ship to the home port
SE-15.002	FR15	Check that when a player arrives at another port, they can trade with the port if there are any treasures in the port to be traded	A player enters a non-home port	They should be shown a choice to trade their cards for treasures	The game should show the player the values of their cards and the treasures in the port.
SE-15.003	FR15	Check that players can choose items to trade	A player moves into a non-home port with card to trade	The player should be shown a trade window and be able to select cards and treasures to trade	The game should allow a player to choose treasures and cards to trade within a port
SE-15.004	FR15	Check that players can cancel their trade after choosing cards	A player has begun a trade and attempts to cancel the trade	The player should be shown the trade window, allowed to select items and then press a cancel button (maybe escape) and then exit the trade	The game should allow the player to cancel their trade at any point while selecting treasures and cards
SE-15.005	FR15	Check that once a trade is requested, the cards have equivalent value	Cards of equivalent value have been chosen during a trade	The player should be taken out of the window and the stock at the port, player's ship and player's hand should be updated	The game should allocate the traded cards correctly
SE-15.006	FR15	Check that a trade cannot be completed if cards are of inequivalent value	Cards of in-equivalent value have been chosen during a trade	The player shouldn't be able to press the trade button (not useable or disabled)	While the selected cards are not equal in value, the user should not be able to press the trade button
SE-15.007	FR15	Check that a player cannot trade for more treasure than their ship can carry	A player chooses to trade for more treasure than their ship can carry	The player shouldn't be able to press the trade button (not useable or disabled)	A player should not be able to trade for more treasure than their ship can carry

SE-15.008	FR15	Check that once a trade is completed, cards traded to another player's home port are put in that player's hand	A player completes a successful trade	The player who's home port is being traded at should receive the cards deposited in the trade	The game should allocate the player who's home port is being traded with the cards that were given to the port in the trade
SE-15.009	FR15	Check that if certain chance cards are implemented, a player should be able to use a Chance card when the trade completed	After a successful trade, the player should be able to use a chance card	A player should be able to use an appropriate chance card after a trade has been completed	The game should allow players to use a chance card when a trade has been completed, as long as the chance card allows it to be played at this point
SE-16.001	FR16	If chance cards 25 and 26 are implemented, then the game needs to recognise when Anchor Bay is reached, if the player holds one of the relevant cards, they should exchange it for treasure	A player enters Anchor Bay with chance card 25 or 26 and exchanges the card for up to two treasure	The player should be able to exchange one of the chance cards for as many treasures as can be fit onto the ship	The game should take the chance card from a player and give the player their chosen treasure cards
SE-17.001	FR17	Check that when a player enters their home port and the total value of treasure in the port (including the ones just added) totals at least 20 points, the game is finished and that player wins the game	A player deposits treasures into their home port making the total value of treasures over 20 points	The players should be shown a screen which says who won and then be given the choice of terminating or starting another game	The game should display who won to the players and then give the players a choice of ending the game or starting another one

[This is taken from Buccaneer Requirements CS221.docx[1]]

REFERENCES

- [1] Buccaneer Requirements CS221.docx. C.W.Loftus. SE.QA.RA-CS22120 1.1 Release
- [2] SE.QA.06 - Test Procedure Standards. C.W. Loftus
- [3] SE.QA.04 – User Interface Specification Standards. C.W. Loftus

DOCUMENT HISTORY

<i>Version</i>	<i>Issue No.</i>	<i>Date</i>	<i>Changes made to document</i>	<i>Changed by</i>
0.1	N/A	18/02/2022	Added tests for FR4, FR5, FR6, FR10, FR11, FR12.	cjh26
0.2	N/A	18/02/2022	Added tests for FR1, FR2, FR3, FR7, FR8, & FR9. Edited test ref numbers.	nar29
0.3	N/A	22/02/2022	Added tests for FR15, 16 & 17.	cjh26
0.4	N/A	02/02/2022	Updating after informal review	cjh26
0.5	N/A	10/03/2022	Made changes as discussed in formal review	nar29
1.0	N/A	11/03/2022	Released documents	nar29