Testing

1 – Test Plan

1.1 Detailed Test Plan

Normal Data

Tests highlighted in red have been omitted due to changes made to the system during impracticalities in the implementation stage.

Test Series and Number	Purpose	Description	Expected Result/ Reason for Omission	Annotation Reference
1.1	Check system main menu 'score new match' button functions properly	The input form for team names should load when the 'score new match' button is clicked on	The enter scorecard page will be displayed.	Figures 1a, 1b
1.2	Check that 'confirm' button on team names input form functions correctly	The input form for batting team should load when the 'confirm' button is clicked on	Page has been removed due to change to inserting all data in one form.	
1.3	Check that 'confirm' button on batting team input form functions correctly	The input form for maximum number of overs per innings should load when the 'confirm' button is clicked on	Page has been removed due to change to inserting all data in one form.	
1.4	Check that 'confirm' button on maximum number of overs input form functions correctly	The input form for new batsman name should load when the 'confirm' button is clicked on	Page has been removed due to change to inserting all data in one form.	
1.5	Check that 'confirm' button on batsman's name input form functions correctly	The input form for new bowler name should load when the 'confirm' button is clicked on	Page has been removed due to change to inserting all data in one form.	
1.6	Check that 'confirm' button on bowler's name input form functions correctly	The input form for ball result name should load when the 'confirm' button is clicked on	Page has been removed due to change to inserting all data in one form.	
1.7	Check that 'confirm' button on ball result input form functions	The scoresheet should update when the 'confirm' button is	Page has been removed due to change to inserting	

	correctly	clicked on	all data in one form.	
1.8	Check that ball result of wicket causes dismissal method input form to be displayed	The dismissal method form should load when a ball result of wicket is entered.	Page has been removed due to change to inserting all data in one form.	
1.9	Check that dismissal method of run out causes dismissed batsman input form to be displayed	The dismissed batsman form should load when a dismissal method of run out is entered.	Page has been removed due to change to inserting all data in one form.	
1.10	Check that all other dismissal methods cause new batsman input form to be displayed	The new batsman form should load when a dismissal method of bowled is entered.	Page has been removed due to change to inserting all data in one form.	
1.11	Check that end of over causes new bowler number form to be displayed.	When six legal balls have been bowled in an over, the new bowler number form should display.	Page has been removed due to change to inserting all data in one form.	
1.12	Check system main menu 'view previous scorecards button functions properly	The input form for scorecard choice should load when the 'view previous scorecards button is clicked on	Scorecard choice input form will appear	
1.13	Check view previous scorecards form 'view' button functions properly	The scorecard choice should load when the 'view button is clicked on	Relevant scorecard will appear	
1.14	Check system main menu 'view player database button functions properly	The player database menu should load when the 'view player database button is clicked on	Player database menu will appear	
1.15	Check player database menu "view batting statistics" button functions properly	The batting stats query form should appear when "view batting statistics" button is clicked.	The batting stats query form will appear.	
1.16	Check player database menu "view bowling statistics" button functions properly	The bowling stats query form should appear when "view bowling statistics" button is clicked.	The bowling stats query form will appear.	
1.17	Check player database menu "view fielding statistics" button functions properly	The fielding stats query form should appear when "view fielding statistics" button is clicked.	The fielding stats query form will appear.	

1.18	Check ‘go’ button function correctly on batting statistics query form.	A list of players and their batting stats should display when the go button is clicked.	The list of players with batting stats will appear.	
1.19	Check ‘go’ button function correctly on bowling statistics query form.	A list of players and their bowling stats should display when the go button is clicked.	The list of players with bowling stats will appear.	See figures 2a, 2b
1.20	Check ‘go’ button function correctly on fielding statistics query form.	A list of players and their fielding stats should display when the go button is clicked.	The list of players with fielding stats will appear.	
1.21	Check “view” buttons for player statistics pages function correctly.	When a list of players is displayed after a query, clicking their particular view button will take the user to the player’s stats page.	The relevant player’s stats page will display.	
2.1	Check a reasonable team name will be accepted by the system.	After entering the team names and clicking confirm, the next input screen will show rather than an error message.	The validation will not return an error.	
2.2	Check a reasonable player name will be accepted by the system.	After entering the player names and clicking confirm, the next input screen will show rather than an error message.	The validation will not return an error.	
2.3	Check that a reasonable maximum number of overs will be accepted by the system.	After entering a reasonable number of overs to be played in a one-day match, the next input screen will be displayed.	Input not required to system due to removal of ball by ball match processing from system due to the limitations of web based applications.	
2.4	Check that a reasonable minimum number of innings played will be acceptable in the batting query.	After entering a reasonable number of innings, a page of batting stats should display.	All players who have played 5 or more innings’ stats will be displayed.	Figures 3a, 3b
2.5	Check that a reasonable minimum number of overs bowled will be acceptable in the bowling query.	After entering a reasonable number of overs, a page of bowling stats should display.	All players who have bowled 20 or more overs’ stats will be displayed.	
2.6	Check that a reasonable minimum	After entering a reasonable number of	All players who have played 5 or	

	number of matches played will be acceptable in the fielding query.	matches, a page of fielding stats should display.	more matches' stats will be displayed.	
3.1	Check module GetTeamNames stores team names to correct variables.	The entered team names should be stored in the correct HomeTeam or AwayTeam variables.	Module not present from system due to removal of ball by ball match processing from system due to the limitations of web based applications.	
3.2	Check module GetBatsmanName stores batsmen names to correct variables.	The entered batsman name should be stored in the correct position in the batsman names array.	Module not present from system due to removal of ball by ball match processing from system due to the limitations of web based applications.	
3.3	Check module GetBowlerName stores bowlers' names to correct variables.	The entered bowler name should be stored in the correct position in the bowler names array.	Module not present from system due to removal of ball by ball match processing from system due to the limitations of web based applications.	
3.4	Check module GetFielderName stores fielders' names to correct variables.	The entered fielder name should be stored in the correct position in the fielder names array.	Module not present from system due to removal of ball by ball match processing from system due to the limitations of web based applications.	
3.5	Check module GetNoofOvers stores number of overs to correct variable.	The entered number of overs should display in the remaining overs section of the scorecard.	Module not present from system due to removal of ball by ball match processing from system due to the limitations of web based applications.	
3.6	Check module GetBallResult stores result to correct variable.	The scorecard should be updated incorporating the result of the most recent ball.	Module not present from system due to removal of ball by ball match processing from system due to the	

			limitations of web based applications.	
3.7	Check module GetDismissalMethod stores result to correct variable.	The scorecard should be updated with the dismissal method.	Module not present from system due to removal of ball by ball match processing from system due to the limitations of web based applications.	
3.8	Check module GetDismissedBatsman stores result to correct variable.	The selected batsman should be shown as 'out' on the scorecard.	Module not present from system due to removal of ball by ball match processing from system due to the limitations of web based applications.	
3.9	Check module GetBattingTeam stores result to correct variable.	The selected team's name should be displayed as the batting team.	Module not present from system due to removal of ball by ball match processing from system due to the limitations of web based applications.	
3.10	Check module GetNextBowler stores result to correct variable.	The selected bowler should be displayed as the current bowler.	Module not present from system due to removal of ball by ball match processing from system due to the limitations of web based applications.	
4.1	Check batsman strike rate calculated correctly	The strike rate displayed should be equal to (runs scored/balls faced) *100	The batsman's strike rate should be displayed on batting stats page.	Figures 5a, 5b
4.2	Check total score calculated correctly.	The score should be equal to the sum of the batsmen's scores + the total extras.	The total score should be displayed on the view scorecard page.	
4.3	Check overs remaining calculated correctly.	Overs remaining should be equal to overs in innings – overs bowled.	Algorithm not present in system due to removal of ball by ball match processing from system due to the limitations of web based applications.	

4.4	Check innings run rate calculated correctly.	Innings run rate should be equal to total score/overs bowled.	Algorithm not present in system due to removal of ball by ball match processing from system due to the limitations of web based applications.	
4.5	Check required run rate calculated correctly.	Required run rate should be equal to truns required/overs remaining.	Algorithm not present in system due to removal of ball by ball match processing from system due to the limitations of web based applications.	
4.6	Check runs required calculated correctly.	Runs required should be equal to first innings score – total score of this innings.	Algorithm not present in system due to removal of ball by ball match processing from system due to the limitations of web based applications.	
4.7	Check partnerships are calculated correctly.	Partnership should be equal to total score – score at time of last wicket.	Algorithm not present in system due to removal of ball by ball match processing from system due to the limitations of web based applications.	
4.8	Check bowling averages calculated correctly.	Bowling average should be equal to runs conceded/wickets taken.	The bowling averages should be displayed correctly on the bowling stats page.	
4.9	Check bowling economies calculated correctly.	Economy rate should be equal to runs conceded/ overs bowled.	The bowling economies should be displayed correctly on the bowling stats page.	
4.10	Check bowling strike rates calculated correctly.	Economy rate should be equal to balls bowled/ wickets taken	The bowling strike rates should be displayed correctly on the bowling stats page.	Figures 6a, 6b
5.1	Check that batting statistics are saved to the correct fields.	When a query is run a list of batsmen and their statistics should be	If Eaton Socon are the batting team data entered on the	Figures 7a-d

		displayed.	scorecard should be stored to the correct fields in the batting performance table.	
5.2	Check that bowling statistics are saved to the correct fields.	When a query is run a list of bowlers and their statistics should be displayed.	If Eaton Socon are not the batting team data entered on the scorecard should be stored to the correct fields in the bowling performance table.	Figures 9a-f
5.3	Check that fielding statistics are saved to the correct fields.	When a query is run a list of fielders and their statistics should be displayed.	If Eaton Socon are not the batting team data entered on the scorecard should be stored to the correct fields in the fielding performance table.	Figures 9a-f
6.1	Check that score cards are saved successfully for later viewing by user.	Score a match and view the score card using the drop down match selection on the scorecard menu page afterwards.	Details of the relevant match will be displayed under the correct headings in the scorecard.	
7.1	Check that the system fulfils it specification	Score a match and attempt to use all facilities in the system.	The client's specification will be fulfilled.	

Erroneous

Tests omitted due to alterations to system during implementation phase shown in red.

Test Series and Number	Purpose	Description	Expected Result/Reason for Omission	Annotation Reference
2.1	Test validation functions correctly on team name entry.	An error should be returned if more than 40 characters are entered or the box is left blank.	The validation will return an error.	
2.2	Test validation functions correctly on player name entry.	An error should be returned if more than 40 characters are entered or the box is left blank.	The validation will return an error.	
2.3	Test validation functions correctly on max no. of overs	An error should be returned if the number entered is outside of the	Data input not required in system due to removal of	

	entry.	range 20 to 90.	ball by ball match processing from system due to the limitations of web based applications.	
2.4	Test validation functions correctly on min. number of innings played entry.	An error should be reported if the min no. of innings played is not between 1 and 40	The validation will return an error.	Figures 9a,9b
2.5	Test validation functions correctly on min. number of overs bowled entry.	An error should be reported if the min no. of overs bowled is not between 1 and 500	The validation will return an error.	
2.6	Test validation functions correctly on min. number of matches played entry.	An error should be reported if the min no. of matches played is not between 1 and 40	The validation will return an error.	

Extreme/Boundary

Tests which have been omitted due to alterations to system during the implementation phase are shown in red.

Test Series and Number	Purpose	Description	Expected Result/ Reason for Omission	Annotation reference
2.1	Test validation functions correctly on team name entry.	An error should be returned if more than 40 characters are entered or the box is left blank.	The validation will return an error for the test data outside the boundary but accept the pieces within them.	
2.2	Test validation functions correctly on player name entry.	An error should be returned if more than 40 characters are entered or the box is left blank.	The validation will return an error for the test data outside the boundary but accept the pieces within them.	
2.3	Test validation functions correctly on max no. of overs entry.	An error should be returned if the number entered is outside of the range 20 to 90.	Data input not required in system due to removal of ball by ball match processing from system due to the limitations of web based applications.	
2.4	Test validation functions correctly	An error should be reported if the min no. of	The validation will return an error for	

	on min. number of innings played entry.	innings played is not between 1 and 40	the test data outside the boundary but accept the pieces within them.	
2.5	Test validation functions correctly on min. number of overs bowled entry.	An error should be reported if the min no. of overs bowled is not between 1 and 500	The validation will return an error for the test data outside the boundary but accept the pieces within them.	Figures 11a, 11b
2.6	Test validation functions correctly on min. number of matches played entry.	An error should be reported if the min no. of matches played is not between 1 and 40	The validation will return an error for the test data outside the boundary but accept the pieces within them.	

1.2 Changes to Test Plan

Due to several adaptations made to my system during the implementation phase some adjustments need to be made to my testing plan. The following table shows a list of the further tests I need to complete:

Normal

Test Number	Test Purpose and Justification for Change to Original Plan	Test Description	Expected Result	Annotation Reference
2.7	Check validation functions properly on entry of batsmen scores. Required as individual scores are no longer going to be calculated by the system.	Enter a set of normal data.	Normal data will be accepted.	
2.8	Check validation functions properly on entry of balls faced by each batsman. Required as the number of balls faced is no longer going to be calculated by the system.	Enter a set of normal data.	Normal data will be accepted.	
2.9	Check validation on bowler action entries. This test was	Bowler actions must only be chosen for selected types of dismissal. Enter	The data will be accepted.	

	overlooked on my original test plan.	a bowler action for a batsman who is caught.		
2.10	Check validation on bowler overs entries. Required as the number of overs bowled is no longer going to be calculated by the system.	Enter a set of normal data.	Normal data will be accepted.	Figures 4a, 4b
2.11	Check validation on bowler maidens entries. Required as the number of maidens is no longer going to be calculated by the system.	Enter a set of normal data.	Normal data will be accepted.	Figures 4a, 4b
2.12	Check validation on bowler runs conceded entries. Required as the number of runs conceded is no longer going to be calculated by the system.	Enter a set of normal data.	Normal data will be accepted.	Figures 4a, 4b
2.13	Check validation on bowler wickets entries. Required as the number of wickets taken is no longer going to be calculated by the system.	Enter a set of normal data.	Normal data will be accepted.	Figures 4a, 4b

Erroneous

Test Number	Test Purpose and Justification for Change to Original Plan	Test Description	Expected Result	Annotation Reference
2.7	Check validation functions properly on entry of batsmen scores. Required as individual scores are no longer going to be calculated by the system.	Enter a set of erroneous data.	The validation should return an error.	
2.8	Check validation	Enter a set of erroneous	The validation	

	functions properly on entry of balls faced by each batsman. Required as the number of balls faced is no longer going to be calculated by the system.	data.	should return an error.	
2.9	Check validation on bowler action entries. This test was overlooked on my original test plan.	Bowler actions must only be chosen for selected types of dismissal. Enter a bowler action for a batsman who is run out.	The validation should return an error.	
2.10	Check validation on bowler overs entries. Required as the number of overs bowled is no longer going to be calculated by the system.	Enter a set of erroneous data.	The validation should return an error.	Figures 10a, 10b
2.11	Check validation on bowler maidens entries. Required as the number of maidens is no longer going to be calculated by the system.	Enter a set of erroneous data.	The validation should return an error.	
2.12	Check validation on bowler runs conceded entries. Required as the number of runs conceded is no longer going to be calculated by the system.	Enter a set of erroneous data.	The validation should return an error.	
2.13	Check validation on bowler wickets entries. Required as the number of wickets taken is no longer going to be calculated by the system.	Enter a set of erroneous data.	The validation should return an error.	

Extreme/Boundary

Test	Test Purpose and	Test Description	Expected Result	Annotation

Number	Justification for Change to Original Plan			Reference
2.7	Check validation functions properly on entry of batsmen scores. Required as individual scores are no longer going to be calculated by the system.	Enter one item of data within the boundary and one outside it at both ends of the boundary.	The data within the boundaries will be accepted whilst the data outside the boundaries will return an error.	Figures 12a, 12b
2.8	Check validation functions properly on entry of balls faced by each batsman. Required as the number of balls faced is no longer going to be calculated by the system.	Enter one item of data within the boundary and one outside it at both ends of the boundary.	The data within the boundaries will be accepted whilst the data outside the boundaries will return an error.	
2.9	No extreme test required.			
2.10	Check validation on bowler overs entries. Required as the number of overs bowled is no longer going to be calculated by the system.	Enter one item of data within the boundary and one outside it at both ends of the boundary.	The data within the boundaries will be accepted whilst the data outside the boundaries will return an error.	
2.11	Check validation on bowler maidens entries. Required as the number of maidens is no longer going to be calculated by the system.	Enter one item of data within the boundary and one outside it at both ends of the boundary.	The data within the boundaries will be accepted whilst the data outside the boundaries will return an error.	
2.12	Check validation on bowler runs conceded entries. Required as the number of runs conceded is no longer going to be calculated by the system.	Enter one item of data within the boundary and one outside it at both ends of the boundary.	The data within the boundaries will be accepted whilst the data outside the boundaries will return an error.	
2.13	Check validation on bowler wickets	Enter one item of data within the boundary and	The data within the boundaries will be	

	entries. Required as the number of wickets taken is no longer going to be calculated by the system.	one outside it at both ends of the boundary.	accepted whilst the data outside the boundaries will return an error.	

2 – Test Data

1.1 Test Data

Normal

Please note inconsistencies in numbering due to removal of tests as explained above.

Test Number	Test Data	Justification for Choice of Test Data
1.1	Click on 'score new match' button	Should result in progress to scorecard input page.
1.12	Click on 'view previous scorecards button	Should result in progress to scorecard menu page
1.13	Click on 'view innings' button	Should result in progress to viewing page of scorecard from that innings.
1.14	Click on 'view player database button	Should result in progress to player database menu page
1.15	Click on "view batting statistics" button	Should result in progress to batting stats query page
1.16	Click on "view bowling statistics" button	Should result in progress to bowling stats query page
1.17	Click on "view fielding statistics" button	Should result in progress to fielding stats query page
1.18	Run a query with a minimum of one innings played.	This value should be accepted by the validation on the field.
1.19	Run a query with a minimum of one over bowled.	This value should be accepted by the validation on the field.
1.20	Run a query with a minimum of one match played.	This value should be accepted by the validation on the field.
1.21	Click on a player's "view" button	Should result in progress to individual player's stats page
2.1	Enter a string of less than 40 chars, e.g. England	This value should be accepted by the validation on the field.
2.2	Enter a string of less than 20 chars, e.g. M.Prior	This value should be accepted by the validation on the field.
2.4	Enter a number between 1 and 40, e.g. 5	This value should be accepted by the validation on the field.
2.5	Enter a number between 1 and 500, e.g. 20	This value should be accepted by the validation on the field.
2.6	Enter a number between	This value should be accepted by the validation

	1 and 40, e.g. 5	on the field.
4.1	Score an innings. Give a player a score of 1 of two balls. View the innings scorecard. Strike rate should be 50 for that player.	The entry of one off two balls is easy to calculate the strike rate for and should be accepted by the validation, therefore is a suitable choice of test data.
4.2	Score an innings, then view it again.	No other way to find out if the total score is being calculated correctly. It should be displayed on the scorecard viewing page.
4.8	Give a bowler figures of two wickets for twenty runs. View scorecard from innings. That bowler's average should be ten.	The entry of two wickets for twenty runs is easy to calculate the average for and should be accepted by the validation, therefore is a suitable choice of test data.
4.9	Give a bowlerfigures of two overs for ten runs. View scorecard from innings. That bowler's econmomy should be five.	The entry of ten runs off two overs is easy to calculate the economy for and should be accepted by the validation, therefore is a suitable choice of test data.
4.10	Give a bowler figures of two wickets off one over.View scorecard from innings. That bowler's strike rate should be three.	The entry of two wickets from an over is easy to calculate the strike rate for and should be accepted by the validation, therefore is a suitable choice of test data.
5.1	Enter a complete innings of normal data with batting team as Eaton Socon.	All batting data should be visible under the correct headings in the batting performance table when viewed in phpmyadmin if the data supplied is all within the validation limits.
5.2	Enter a complete innings of normal data with batting team not Eaton Socon.	All bowling data should be visible under the correct headings in the bowling performance table when viewed in phpmyadmin if the data supplied is all within the validation limits.
5.3	Enter a complete innings of normal data with batting team not Eaton Socon.	All fielding data should be visible under the correct headings in the fielding performance table when viewed in phpmyadmin if the data supplied is all within the validation limits.
6.1	Score an innings. From main menu, select view previous scorecards. Select the scorecard of the match to be viewed.	This is the only method by which the display of previous innings can be tested. All data entered must be within validation limits for effective testing.
7.1	Score a match and view score cards and database from that game.	This is the only method by which to evaluate if the system fulfils the client's specification.

Erroneous

Please note inconsistencies in numbering result from changes to system during implementation phase as described above.

Test Number	Test Data	Justification for Choice of Test Data
2.1	‘’ ‘amananana Amansjjasjsa Asdhsbfsdf Hjsdfilsdhfvd Hfwehewffgd Iuhsfeherhtho’	The field should not accept a blank entry. This should be too many characters to be accepted by the validation.
2.2	‘’ ‘alsksjdhsjk Shansbdhgsg’	The field should not accept a blank entry. This should be too many characters to be accepted by the validation.
2.4	‘-23’ 78	The first item should not be accepted by the validation as it is negative whilst the second item should not be accepted as it is too large.
2.5	‘-23’ ‘897’	The first item should not be accepted by the validation as it is negative whilst the second item should not be accepted as it is too large.
2.6	‘-23’ ‘897’	The first item should not be accepted by the validation as it is negative whilst the second item should not be accepted as it is too large.

Extreme/Boundary

Please note inconsistencies in numbering result from changes to system during implementation phase as described above.

Test Number	Test Data	Justification for Choice of Test Data
2.1	40 chars 41 chars	The two items lie either side of the validation boundary. The first should be accepted and the second shouldn’t.
2.2	20 chars 21 chars	The two items lie either side of the validation boundary. The first should be accepted and the second shouldn’t.
2.4	40 41	The two items lie either side of the validation boundary. The first should be accepted and the second shouldn’t.
2.5	500 501	The two items lie either side of the validation boundary. The first should be accepted and the second shouldn’t.
2.6	40 41	The two items lie either side of the validation boundary. The first should be accepted and the second shouldn’t.

1.2 Changes to Test Data

The following table shows changes to my test data required due to alterations to my system made during the implementation phase. The table also contains the data which will be used for the new tests I have proposed in section 1.2.

Normal

Test Number	Test Data	Justification for Choice of Test Data
2.7	34	This is a piece of data within the boundary set in the validation.
2.8	65	This is a piece of data within the boundary set in the validation.
2.9	How Out = Caught Bowler Action = Right Arm Spin	A bowler action is required for storage of a caught dismissal and therefore this an appropriate normal set of data.
2.10	8.5	This is a piece of data within the boundary set in the validation. It will also test that the validation accepts decimals.
2.11	2	This is a piece of data within the boundary set in the validation.
2.12	52	This is a piece of data within the boundary set in the validation.
2.13	5	This is a piece of data within the boundary set in the validation.

Erroneous

Test Number	Test Data	Justification for Choice of Test Data
2.7	10000 -10 35.6 hello	These items of data will ensure that the score field rejects items larger than the validation limit, negative numbers, decimals and strings, theerfore ensuring the system is robust.
2.8	10000 -10 35.6 hello	These items of data will ensure that the score field rejects items larger than the validation limit, negative numbers, decimals and strings, theerfore ensuring the system is robust.
2.9	How Out = Run Out Bowler Action = Right Arm Spin	This will check that a bowler action is not accepted for run out dismissals therefore ensuring that the system is robust and preventing storage of inaccurate data.
2.10	400 -10 hello	These items of data will ensure that the score field rejects items larger than the validation limit, negative numbers and strings, theerfore ensuring the system is robust.
2.11	400 -10 35.6 hello	These items of data will ensure that the score field rejects items larger than the validation limit, negative numbers, decimals and strings, theerfore ensuring the system is robust.
2.12	100 -10 35.6 hello	These items of data will ensure that the score field rejects items larger than the validation limit, negative numbers, decimals and strings, theerfore ensuring the system is robust.
2.13	400	These items of data will ensure that the score

	-10 35.6 hello	field rejects items larger than the validation limit, negative numbers, decimals and strings, theerfore ensuring the system is robust.

Extreme/Boundary

Test Number	Test Data	Justification for Choice of Test Data
2.7	-1 0 999 1000	These items of data provide tests for both the upper and lower boundaries. Each boundary has an item of data just within the boundary and one just outside it.
2.8	-1 0 999 1000	These items of data provide tests for both the upper and lower boundaries. Each boundary has an item of data just within the boundary and one just outside it.
2.9	No extreme test required.	
2.10	-1 0 99 100	These items of data provide tests for both the upper and lower boundaries. Each boundary has an item of data just within the boundary and one just outside it.
2.11	-1 0 99 100	These items of data provide tests for both the upper and lower boundaries. Each boundary has an item of data just within the boundary and one just outside it.
2.12	-1 0 999 1000	These items of data provide tests for both the upper and lower boundaries. Each boundary has an item of data just within the boundary and one just outside it.
2.13	-1 0 10 11	These items of data provide tests for both the upper and lower boundaries. Each boundary has an item of data just within the boundary and one just outside it.

3 – Annotated Samples

3.1 – Actual Results

Normal Testing

Test Number	Expected Result	Test Data	Actual Result	Annotation Reference
1.1	The enter scorecard page will be displayed.	Click on ‘score new match’ button	The enter scorecard page was displayed, as expected.	Figures 1a, 1b
1.12	Scorecard choice input form will appear	Click on ‘view previous scorecards button	The scorecard menu page was displayed, as expected.	

1.13	Relevant scorecard will appear	Click on 'view innings' button	The previous scorecard selected by the user was displayed, as expected.	
1.14	Player database menu will appear	Click on 'view player database button	The player database menu was displayed, as expected.	
1.15	The batting stats query form will appear.	Click on "view batting statistics" button	The batting stats query page was displayed, as expected.	
1.16	The bowling stats query form will appear.	Click on "view bowling statistics" button	The bowling stats query page was displayed, as expected.	
1.17	The fielding stats query form will appear.	Click on "view fielding statistics" button	The fielding stats query page was displayed, as expected.	
1.18	The list of players with batting stats will appear.	Run a query with a minimum of one innings played.	The batting stats overview page was displayed, as expected.	
1.19	The list of players with bowling stats will appear.	Run a query with a minimum of one over bowled.	The bowling stats overview page was displayed, as expected.	See figures 2a, 2b
1.20	The list of players with fielding stats will appear.	Run a query with a minimum of one match played.	The fielding stats overview page was displayed, as expected.	
1.21	The relevant player's stats page will display.	Click on a player's "view" button	The individual player's statistics page was displayed, as expected.	
2.1	The validation will not return an error.	Enter a string of less than 40 chars, e.g. England	The team name England was accepted, as expected.	
2.2	The validation will not return an error.	Enter a string of less than 20 chars, e.g. M.Prior	The player name M.Prior was accepted as expected.	
2.4	All players who	Enter a	All players who have	Figures 3a, 3b

	have played 5 or more innings' stats will be displayed.	number between 1 and 40, e.g. 5	played more than 5 innings are displayed as expected.	
2.5	All players who have bowled 20 or more overs stats will be displayed.	Enter a number between 1 and 500, e.g. 20	All players who have bowled 20 or more overs stats are displayed as expected.	
2.6	All players who have played 5 or more matches' stats will be displayed.	Enter a number between 1 and 40, e.g. 5	All players who have played 5 or more matches' stats are displayed as expected.	
2.7	Normal data will be accepted.	34	Data accepted as expected.	
2.8	Normal data will be accepted.	65	Data accepted as expected.	
2.9	The data will be accepted.	How Out = Caught Bowler Action = Right Arm Spin	Data accepted as expected.	
2.10	Normal data will be accepted.	8.5	Data accepted as expected.	Figures 4a, 4b
2.11	Normal data will be accepted.	2	Data accepted as expected.	Figures 4a, 4b
2.12	Normal data will be accepted.	52	Data accepted as expected.	Figures 4a, 4b
2.13	Normal data will be accepted.	5	Data accepted as expected.	Figures 4a, 4b
4.1	The batsman's strike rate should be displayed on batting stats page.	Score an innings. Give a player a score of 1 of two balls. View the innings scorecard. Strike rate should be 50 for that player.	A strike rate of 50 is displayed as expected.	Figures 5a, 5b
4.2	The total score should be displayed on the view scorecard page.	Score an innings, then view it again.	The total score has been calculated and displayed correctly.	
4.8	The bowling	Give a	A bowling average of ten	Figures 6a, 6b

	averages should be displayed correctly on the bowling stats page.	bowler figures of two wickets for twenty runs. View scorecard from innings. That bowler's average should be ten.	is displayed as expected.	
4.9	The bowling economies should be displayed correctly on the bowling stats page.	Give a bowler figures of two overs for ten runs. View scorecard from innings. That bowler's econmomy should be five.	A bowling economy of five is displayed as expected.	
4.10	The bowling strike rates should be displayed correctly on the bowling stats page.	Give a bowler figures of two wickets off one over. View scorecard from innings. That bowler's strike rate should be three.	A bowling strike rate of 3 is displayed as expected.	
5.1	If Eaton Soconare the batting team data entered on the scorecard should be stored to the correct fields in the batting performance table.	A normal innings with Eaton Socon as batting team.	All data relating to the batting team (Eaton Socon) was stored in the batting performance table as expected.	Figures 7a-d
5.2	If Eaton Socon are not the batting team data entered on the scorecard	A normal innings without Eaton Socon	All data relating to the bowling team (Eaton Socon) stored to the bowling performance	Figures 8a-f

	should be stored to the correct fields in the bowling performance table.	as batting team.	table as expected.	
5.3	If Eaton Socon are not the batting team data entered on the scorecard should be stored to the correct fields in the fielding performance table.	A normal innings without Eaton Socon as batting team.	All data relating to Eaton Socon's fielding performance was stored to the fielding performance table as expected.	Figures 8a-f
6.1	Details of the relevant match will be displayed under the correct headings in the scorecard.	Score an innings. From main menu, select view previous scorecards. Select the scorecard of the match to be viewed.	That particular innings was displayed with all required information present under the correct headings as expected.	
7.1	The client's specification will be fulfilled.	Score a match and view score cards and database from that game.	Unfortunately the system has failed to meet some of the client's specifications. This is because the implementation of ball by ball match processing proved impossible with my limited skill set, time and resources. Therefore, the conditions of reducing human error and data duplication by having the computer undertake much of the processing have not been realised. However, the system has met the specification objectives of storing matches for eventual viewing by the user and compiling a statistical record for each player.	

Erroneous

Test	Expected Result	Input Data	Actual Result	Annotation

Number				Reference
2.1	The validation will return an error.	‘’ ‘amananana Amansjjasjsa Asdhsbfsdf Hjsdfilsdhfvd Hfwehewffgd Iuhsfeherhtho’	No errors were returned.	
2.2	The validation will return an error.	‘’ ‘alsksjdhsjk Shansbdhgsg’	No errors were returned.	
2.4	The validation will return an error.	‘-23’ 78	No errors were returned.	Figures 9a, 9b
2.5	The validation will return an error.	‘-23’ ‘897’	No errors were returned.	
2.6	The validation will return an error.	‘-23’ ‘897’	No errors were returned.	
2.7	The validation should return an error.	10000 -10 35.6 hello	No errors were returned.	
2.8	The validation should return an error.	10000 -10 35.6 hello	No errors were returned.	
2.9	The validation should return an error.	How Out = Run Out Bowler Action = Right Arm Spin	No errors were returned.	
2.10	The validation should return an error.	400 -10 hello	No errors were returned.	Figures 10a, 10b
2.11	The validation should return an error.	400 -10 35.6 hello	No errors were returned.	
2.12	The validation should return an error.	100 -10 35.6 hello	No errors were returned.	
2.13	The validation should return an error.	400 -10 35.6 hello	No errors were returned.	

Extreme/Boundary

Test Number	Expected Result	Input Data	Actual Result	Annotation Reference
2.1	The validation will return an error for the test data outside the boundary but accept the pieces within them.	40 chars 41 chars	No errors were returned.	
2.2	The validation will return an error for the test data outside the boundary but accept the pieces within them.	20 chars 21 chars	No errors were returned.	
2.4	The validation will return an error for the test data outside the boundary but accept the pieces within them.	40 41	No errors were returned.	
2.5	The validation will return an error for the test data outside the boundary but accept the pieces within them.	500 501	No errors were returned.	Figures 11a, 11b
2.6	The validation will return an error for the test data outside the boundary but accept the pieces within them.	40 41	No errors were returned.	
2.7	The data within the boundaries will be accepted whilst the data outside the boundaries will return an error.	-1 0 999 1000	No errors were returned.	Figures 12a, 12b
2.8	The data within the boundaries will be accepted whilst the data outside the boundaries will return an error.	-1 0 999 1000	No errors were returned.	
2.10	The data within	-1	No errors were	

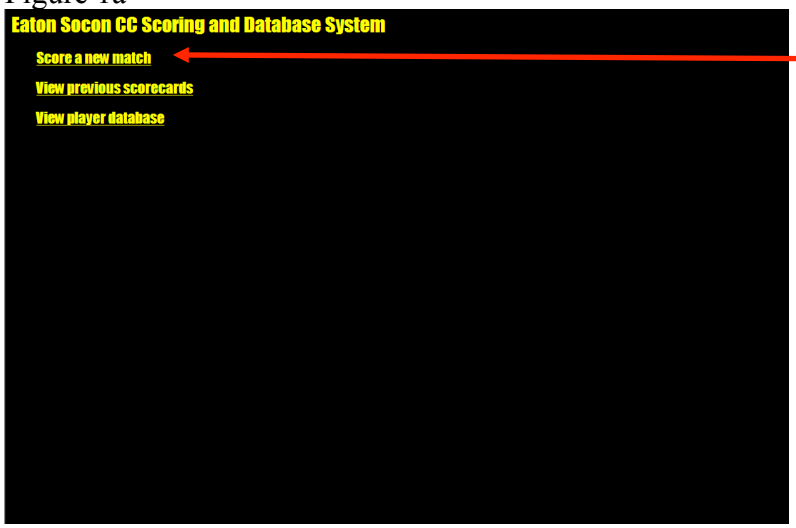
	the boundaries will be accepted whilst the data outside the boundaries will return an error.	0 99 100	returned.	
2.11	The data within the boundaries will be accepted whilst the data outside the boundaries will return an error.	-1 0 99 100	No errors were returned.	
2.12	The data within the boundaries will be accepted whilst the data outside the boundaries will return an error.	-1 0 999 1000	No errors were returned.	
2.13	The data within the boundaries will be accepted whilst the data outside the boundaries will return an error.	-1 0 10 11	No errors were returned.	

3.2 – Evidence

Normal Testing

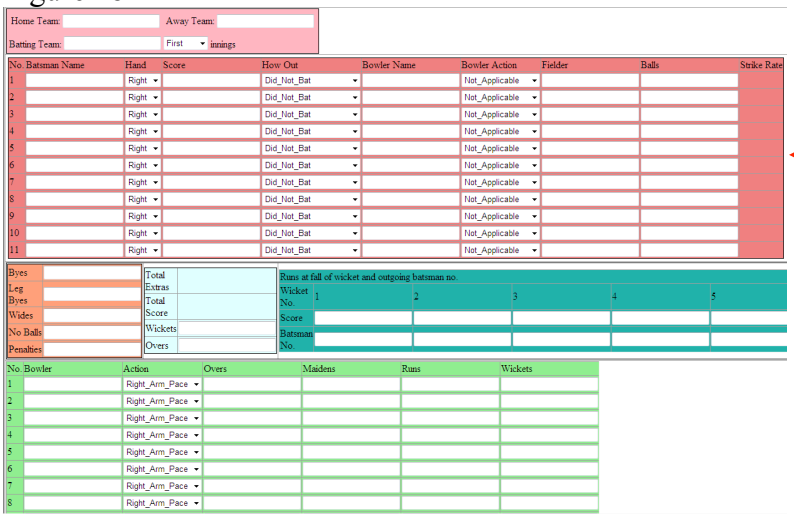
Test 1.1

Figure 1a



Clicking on this link should take me to the scorecard page.

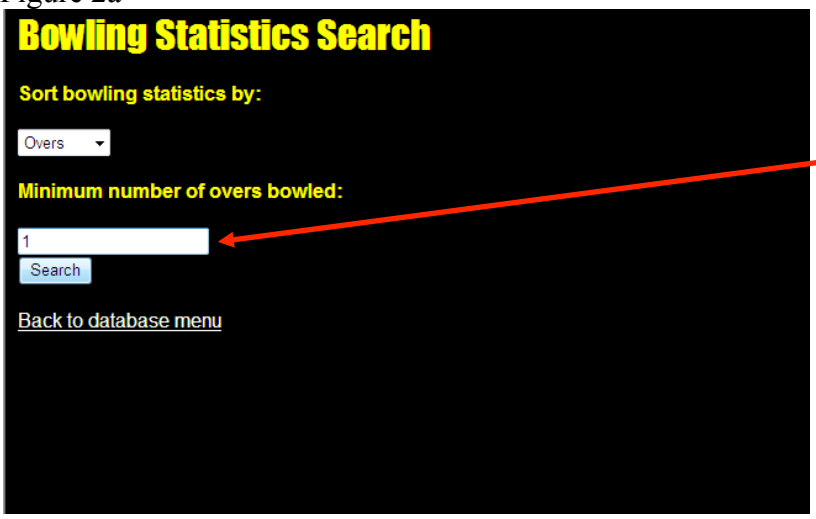
Figure 1b



The scorecard page is displayed as expected.

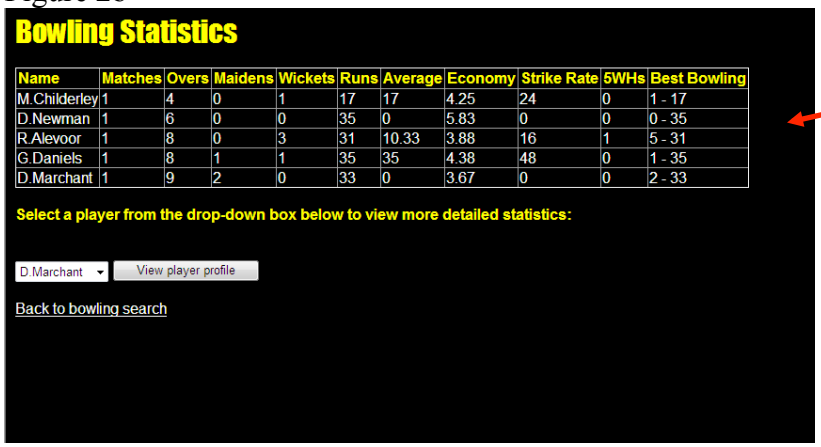
Test 1.19

Figure 2a



A value of 1 was entered for the minimum no. of overs bowled value and the search button clicked.

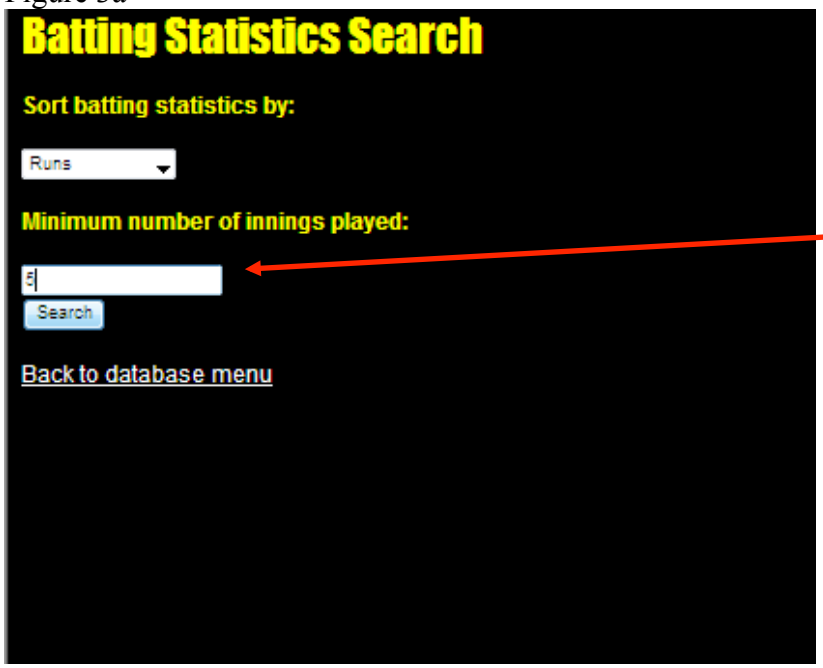
Figure 2b



The value of 1 was accepted and the bowling stats page displayed as expected, proving the search button functioned correctly.

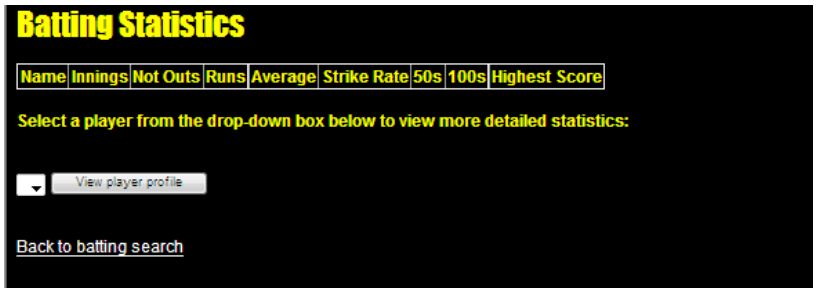
Test 2.4

Figure 3a



A value of five was entered in the minimum number of innings played box and the search button was clicked.

Figure 3b



The batting statistics page was displayed as expected (note that no players were found because nobody on the database had played five innings.

Tests 2.10-2.13

Figure 4a

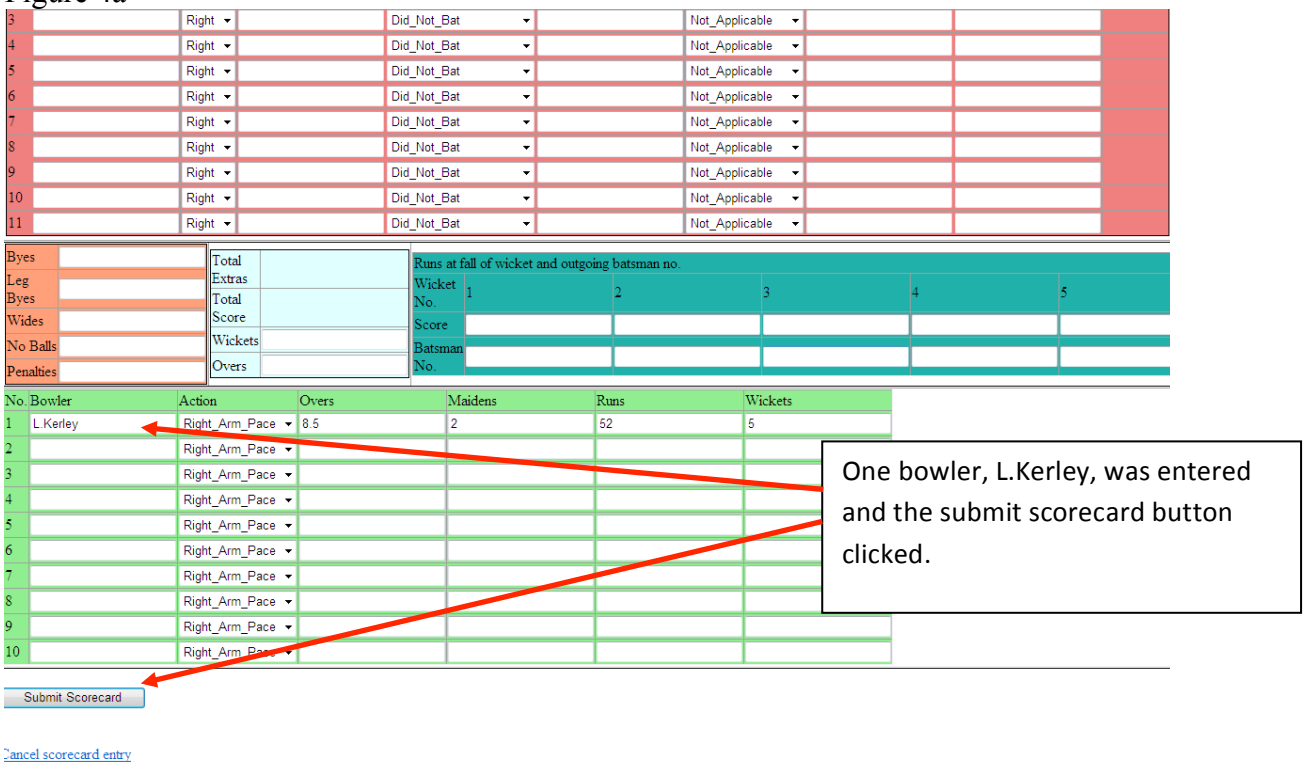
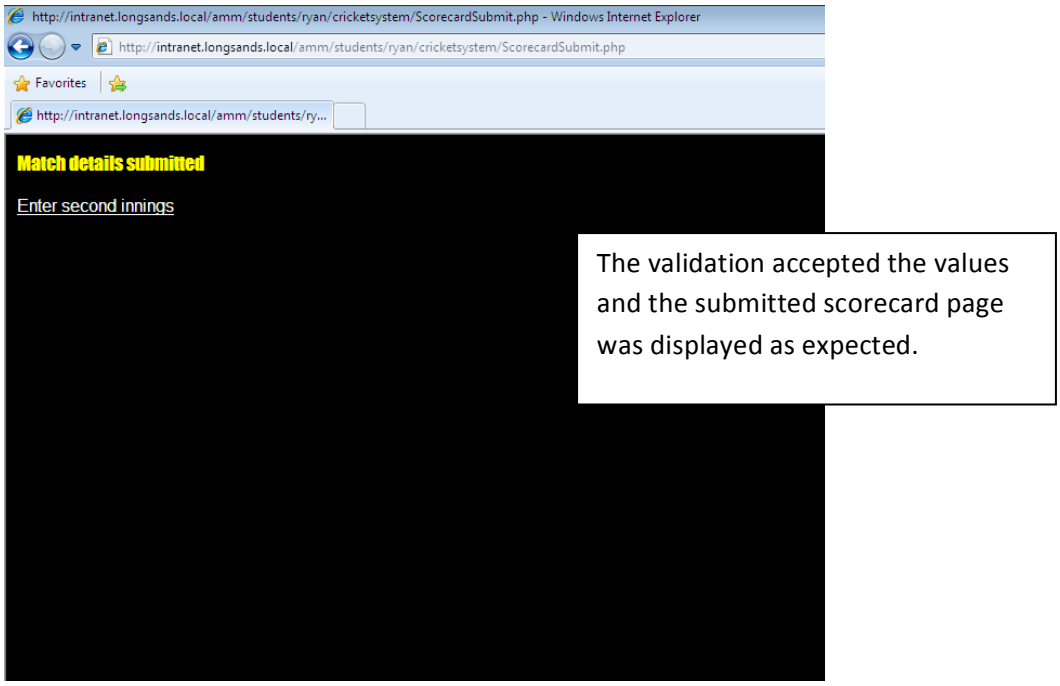
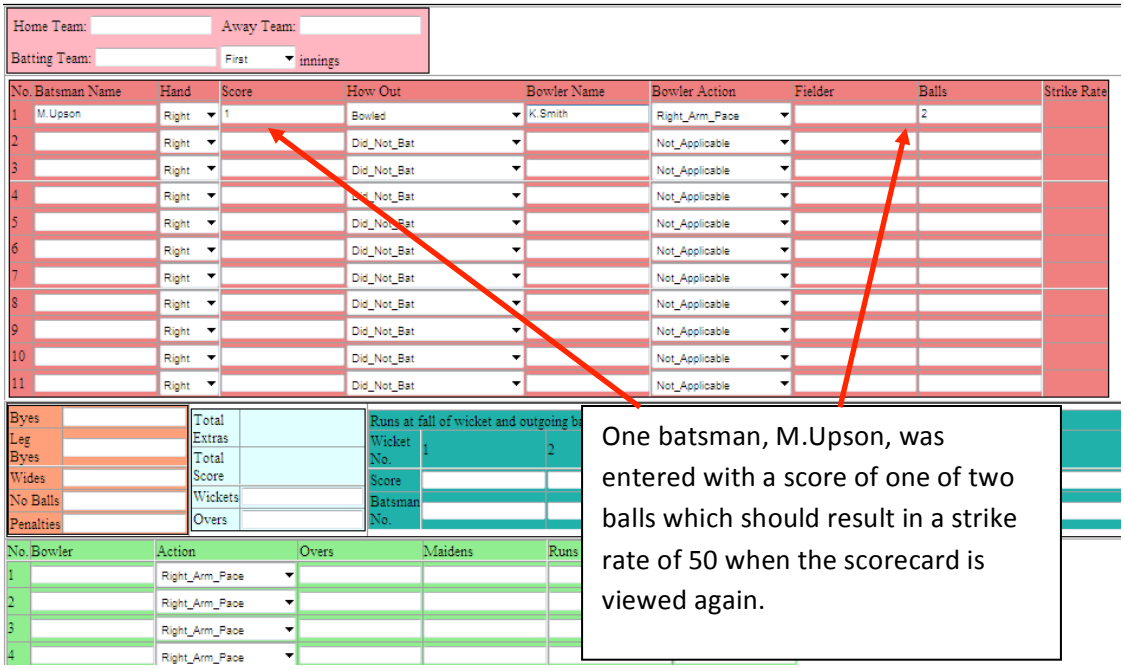


Figure 4b



Test 4.1

Figure 5a



I then submitted the scorecard, returned to the main menu, went to the scorecard menu and selected this innings to view again, resulting in the page below:

Figure 5b

Home Team: Away Team:

Batting Team: First innings

No.	Batsman Name	Hand	Score	How Out	Bowler Name	Bowler Action	Fielder	Balls	Strike Rate
1	M.Upson	R	1	Bowled	K.Smith	RPace		2	50
2		R	0	DNB		NA		0	0
3		R	0	DNB		NA		0	0
4		R	0	DNB		NA		0	0
5		R	0	DNB		NA		0	0
6		R	0	DNB		NA		0	0
7		R	0	DNB		NA		0	0
8		R	0	DNB		NA		0	0
9		R	0	DNB		NA		0	0
10		R	0	DNB		NA		0	0
11		R	0	DNB		NA		0	0

Byes	Total Extras	Runs at fall of wicket and outgoing batsman no.
Leg Byes	Total Score	Wicket No. 1 2 3 4 5 6 7 8 9 10
Wides	Wickets	Score
No Balls	Overs	Batsman No.
Penalties		

No.	Bowler	Action	Overs	Maidens	Runs	Wickets	Average	Economy	Strike Rate

When viewed again the scorecard shows M.Upson's performance and his strike rate has been calculated correctly as 50, as expected.

Back to scorecard menu
Back to main menu

Test 4.8
Figure 6a

	Byes		Total Extras		Runs at fall of wicket and outgoing batsman no.				
	Leg Byes		Total Score		Wicket No.	1	2	3	4
	Wides		Wickets		Score				
	No Balls		Overs		Batsman No.				
	Penalties								

No.	Bowler	Action	Overs	Maidens	Runs	Wickets
1	F.Tyson	Right_Arm_Pace	5	1	20	2
2		Right_Arm_Pace				
3		Right_Arm_Pace				
4		Right_Arm_Pace				
5		Right_Arm_Pace				
6		Right_Arm_Pace				
7		Right_Arm_Pace				
8		Right_Arm_Pace				
9		Right_Arm_Pace				
10		Right_Arm_Pace				

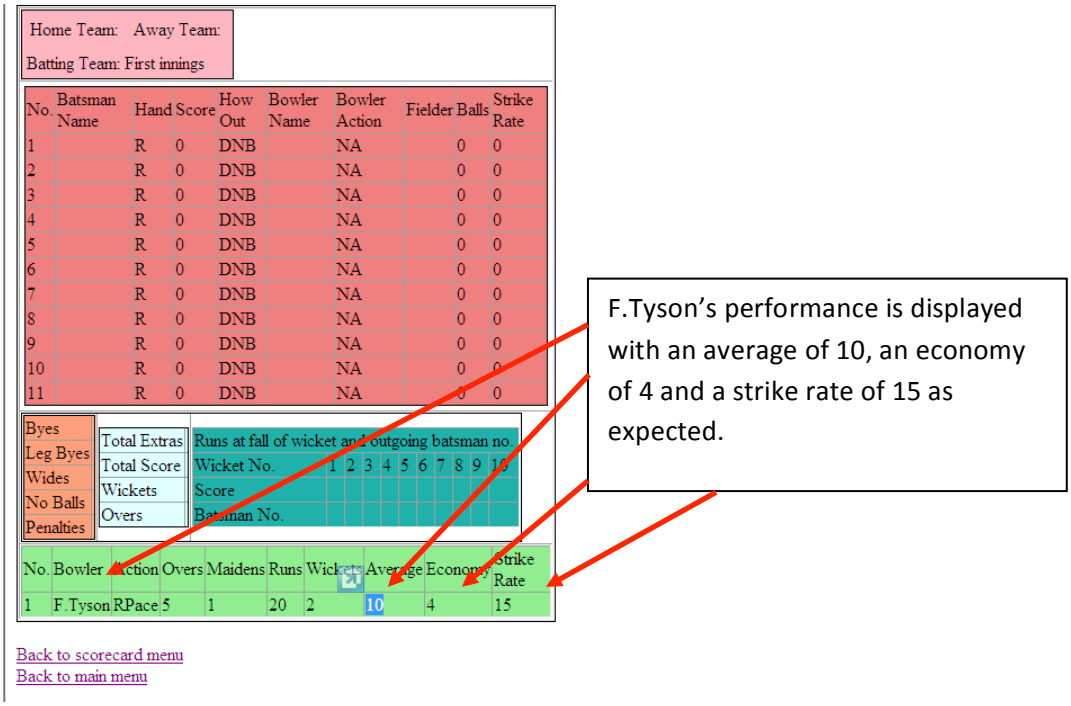
Submit Scorecard

Cancel scorecard entry

One bowler, F.Tyson, was entered with figures of 5 overs 1 maiden 2 wickets for 20 runs. This should result in a strike rate of 15, an average of 10 and an economy of four when the scorecard is viewed again.

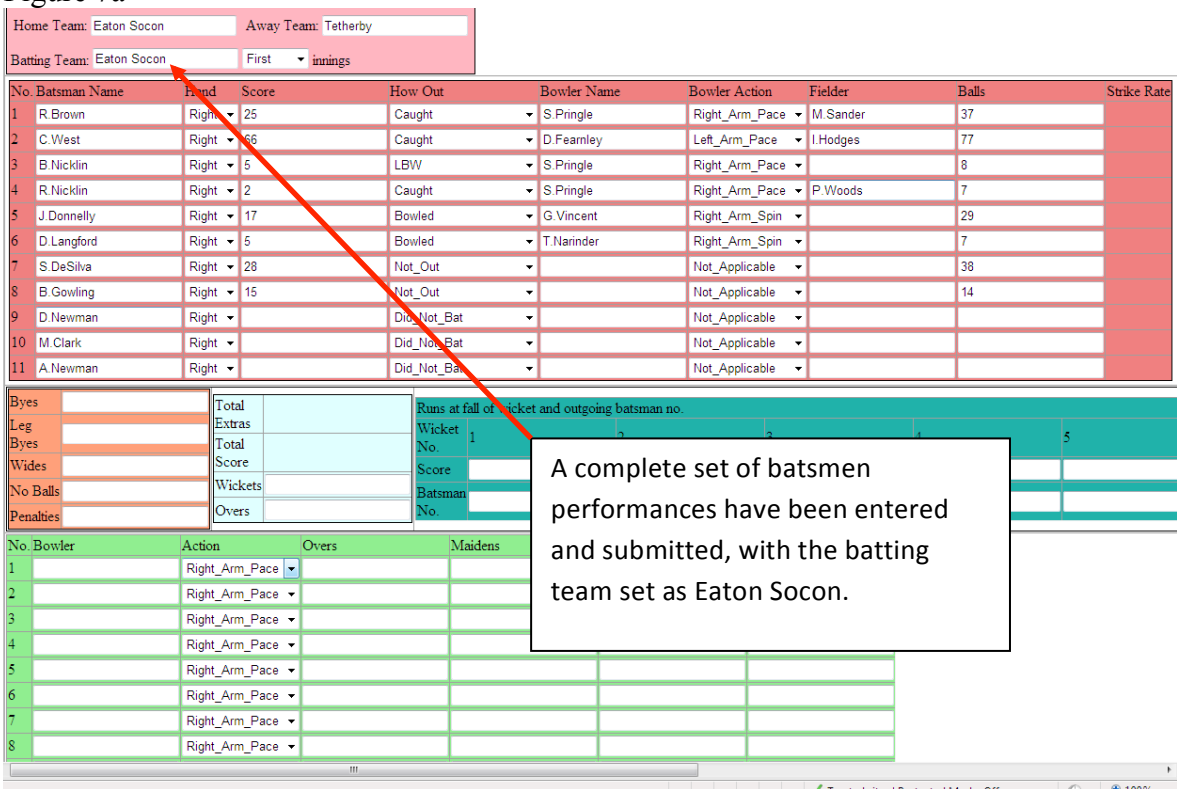
I submitted the scorecard shown in figure 6a, returned to the main menu, then moved to the scorecard menu and selected the innings recorded in figure 6a for viewing, resulting in the page displayed below in figure 6b.

Figure 6b



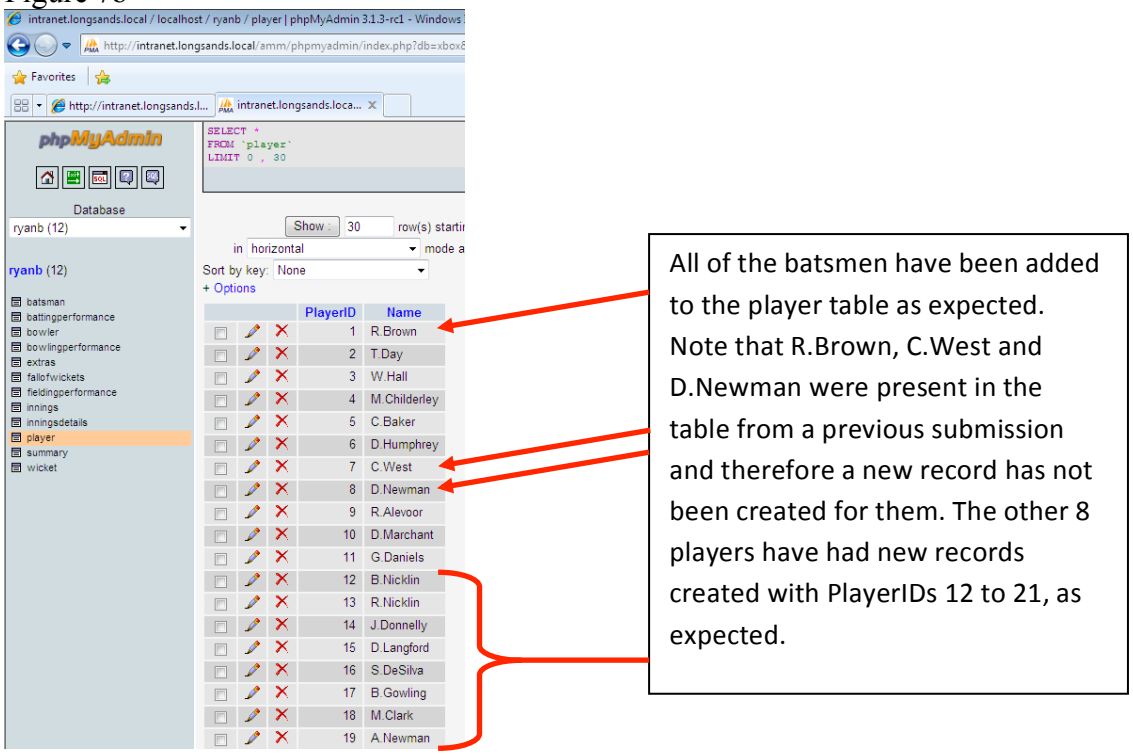
Test 5.1

Figure 7a



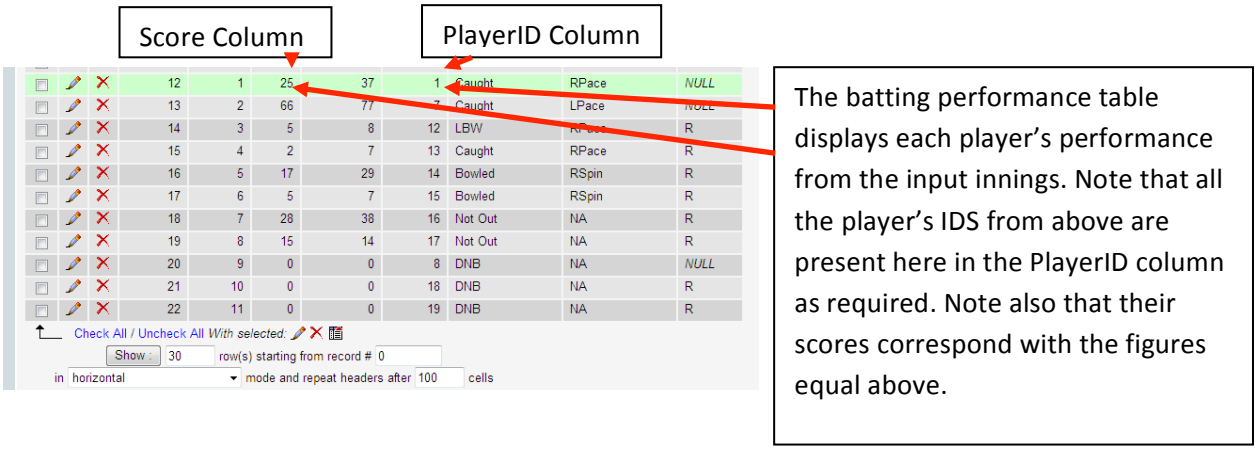
After submitting the scorecard, I minimised the system and went to view the database table player which is shown below in figure 7b.

Figure 7b



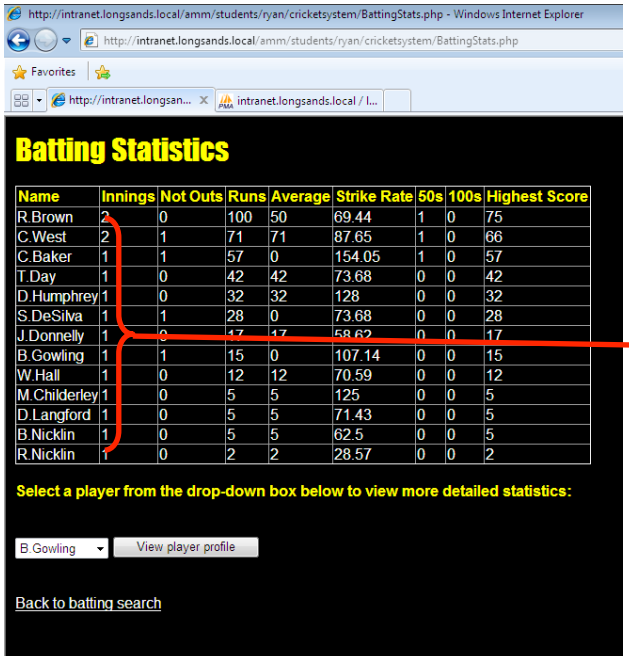
Next I looked at the batting performance table which is shown below in figure 7c.

Figure 7c



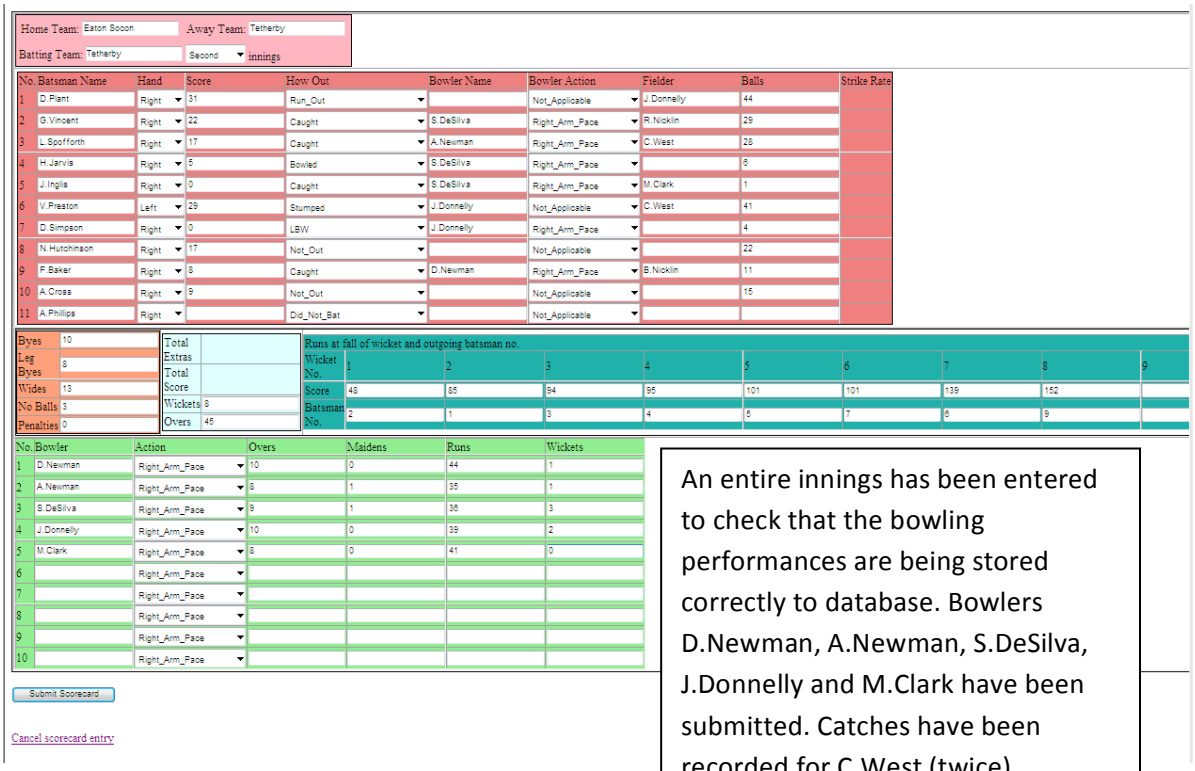
Finally I brought the system back up on screen and viewed the player database. I ran a batting query for players who have played a minimum of one innings, resulting in the page shown below:

Figure 7d



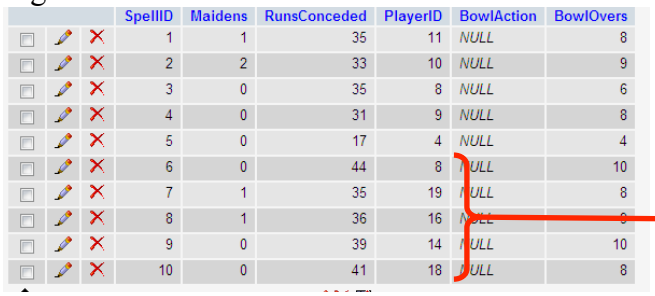
To confirm the success of the storage of the innings to database, this screenshot shows that all of the players submitted have entries on the batting statistics page. Note that some other players were present from previous submissions.

Tests 5.2-5.3
Figure 8a



An entire innings has been entered to check that the bowling performances are being stored correctly to database. Bowlers D.Newman, A.Newman, S.DeSilva, J.Donnelly and M.Clark have been submitted. Catches have been recorded for C.West (twice), R.Nicklin, M.Clark and B.Nicklin and a run out has been recorded for J.Donnelly.

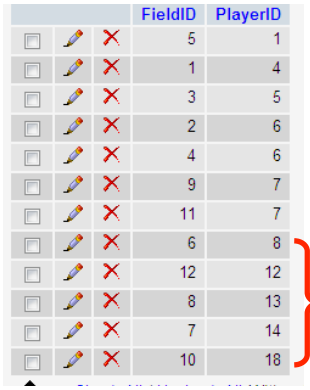
Figure 8b



			SpellID	Maidens	RunsConceded	PlayerID	BowlAction	BowlOvers
☐	✎	✕	1	1	35	11	NULL	8
☐	✎	✕	2	2	33	10	NULL	9
☐	✎	✕	3	0	35	8	NULL	6
☐	✎	✕	4	0	31	9	NULL	8
☐	✎	✕	5	0	17	4	NULL	4
☐	✎	✕	6	0	44	8	NULL	10
☐	✎	✕	7	1	35	19	NULL	8
☐	✎	✕	8	1	36	16	NULL	8
☐	✎	✕	9	0	39	14	NULL	10
☐	✎	✕	10	0	41	18	NULL	8

The players are all already present in the player table due to their batting performances submitted in previous tests. Note that the bottom five bowling performances are the ones submitted above, with the correct player Ids as stored in the player table previously for these bowlers.

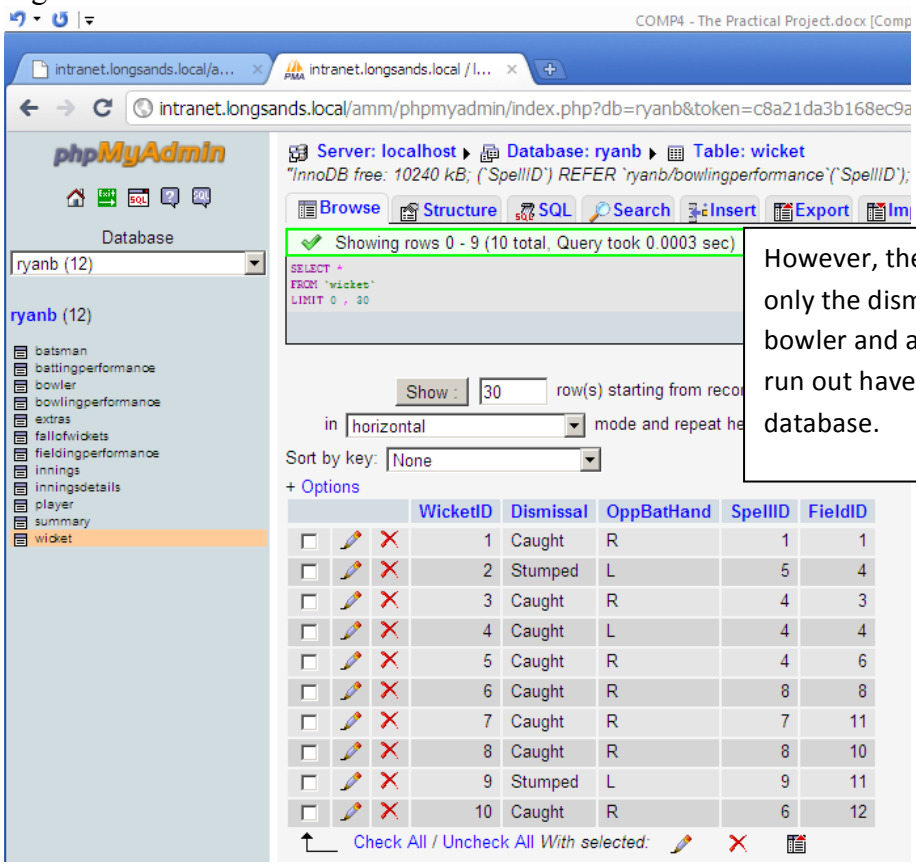
Figure 8c



	FieldID	PlayerID
	5	1
	1	4
	3	5
	2	6
	4	6
	9	7
	11	7
	6	8
	12	12
	8	13
	7	14
	10	18

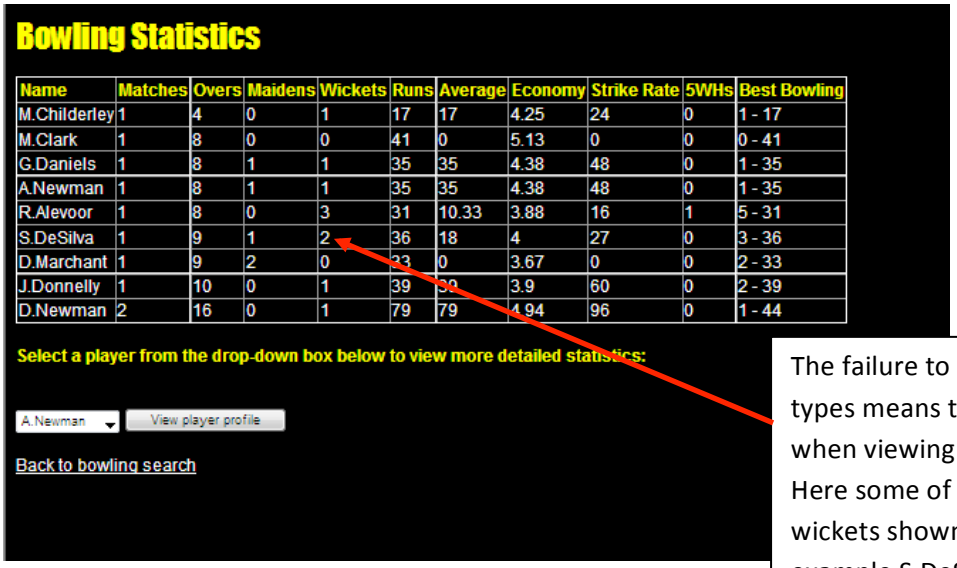
The players are all already present in the player table due to their batting performances submitted in previous tests. Note that the bottom five fielding IDs are the ones created through the submission above, with the correct player Ids as stored in the player table previously for these fielders.

Figure 8d



However, there is a problem here: only the dismissals involving a bowler and a fielder i.e stumped or run out have been stored in the database.

Figure 8e



Bowling Statistics

Name	Matches	Overs	Maidens	Wickets	Runs	Average	Economy	Strike Rate	5WHs	Best Bowling
M.Childerley	1	4	0	1	17	17	4.25	24	0	1 - 17
M.Clark	1	8	0	0	41	0	5.13	0	0	0 - 41
G.Daniels	1	8	1	1	35	35	4.38	48	0	1 - 35
A.Newman	1	8	1	1	35	35	4.38	48	0	1 - 35
R.Alevoor	1	8	0	3	31	10.33	3.88	16	1	5 - 31
S.DeSilva	1	9	1	2	36	18	4	27	0	3 - 36
D.Marchant	1	9	2	0	33	0	3.67	0	0	2 - 33
J.Donnelly	1	10	0	1	39	39	3.9	60	0	2 - 39
D.Newman	2	16	0	1	79	79	4.94	96	0	1 - 44

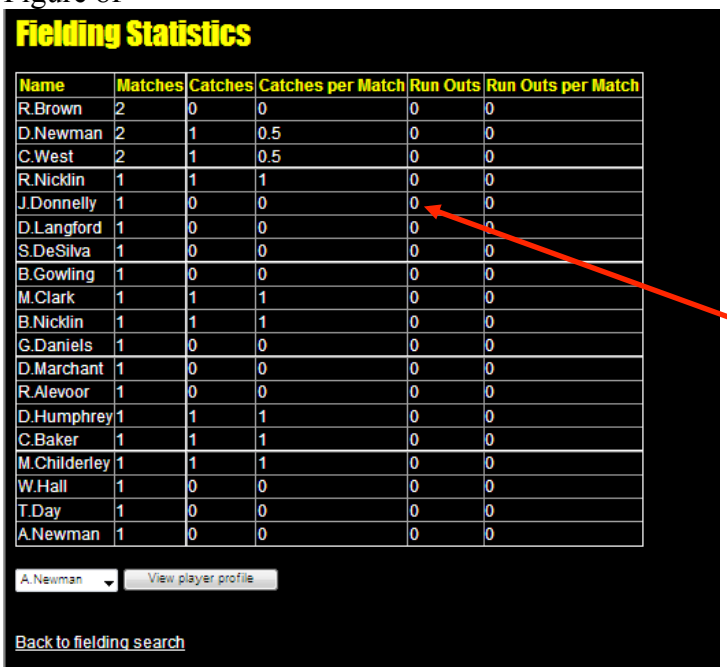
Select a player from the drop-down box below to view more detailed statistics:

A.Newman | View player profile

Back to bowling search

The failure to store other dismissal types means there are problems when viewing the player database. Here some of the bowlers have less wickets shown than they should, for example S.DeSilva, who has two wickets to his name instead of 3.

Figure 8f



Fielding Statistics

Name	Matches	Catches	Catches per Match	Run Outs	Run Outs per Match
R.Brown	2	0	0	0	0
D.Newman	2	1	0.5	0	0
C.West	2	1	0.5	0	0
R.Nicklin	1	1	1	0	0
J.Donnelly	1	0	0	0	0
D.Langford	1	0	0	0	0
S.DeSilva	1	0	0	0	0
B.Gowling	1	0	0	0	0
M.Clark	1	1	1	0	0
B.Nicklin	1	1	1	0	0
G.Daniels	1	0	0	0	0
D.Marchant	1	0	0	0	0
R.Alevoor	1	0	0	0	0
D.Humphrey	1	1	1	0	0
C.Baker	1	1	1	0	0
M.Childerley	1	1	1	0	0
W.Hall	1	0	0	0	0
T.Day	1	0	0	0	0
A.Newman	1	0	0	0	0

A.Newman | View player profile

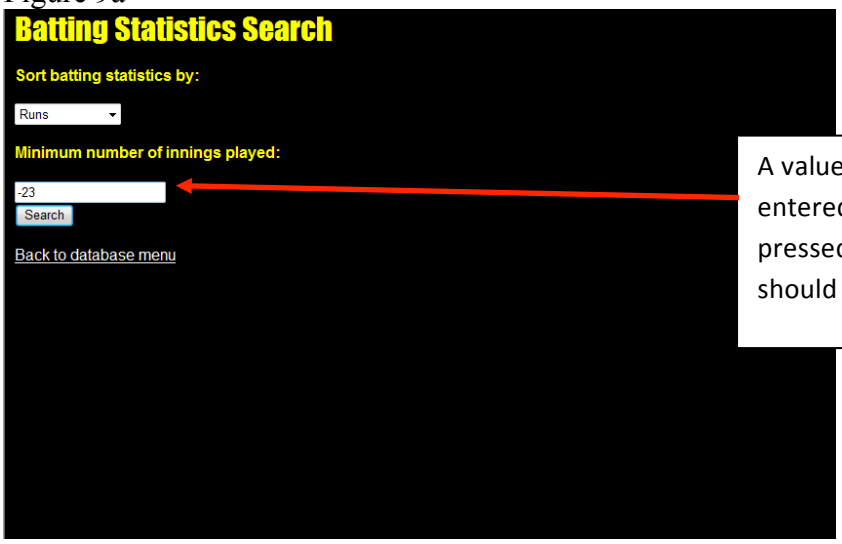
Back to fielding search

There are also no run outs displayed in the fielding page, despite the fact that one was entered for player J.Donnelly

Erroneous Testing

Test 2.4

Figure 9a



A value of -23 innings has been entered and the search button pressed. The system's validation should return an error.

Figure 9b

No error was returned and the system progressed to the batting stats page instead. The validation failed this test.

Test 2.10

Figure 10a

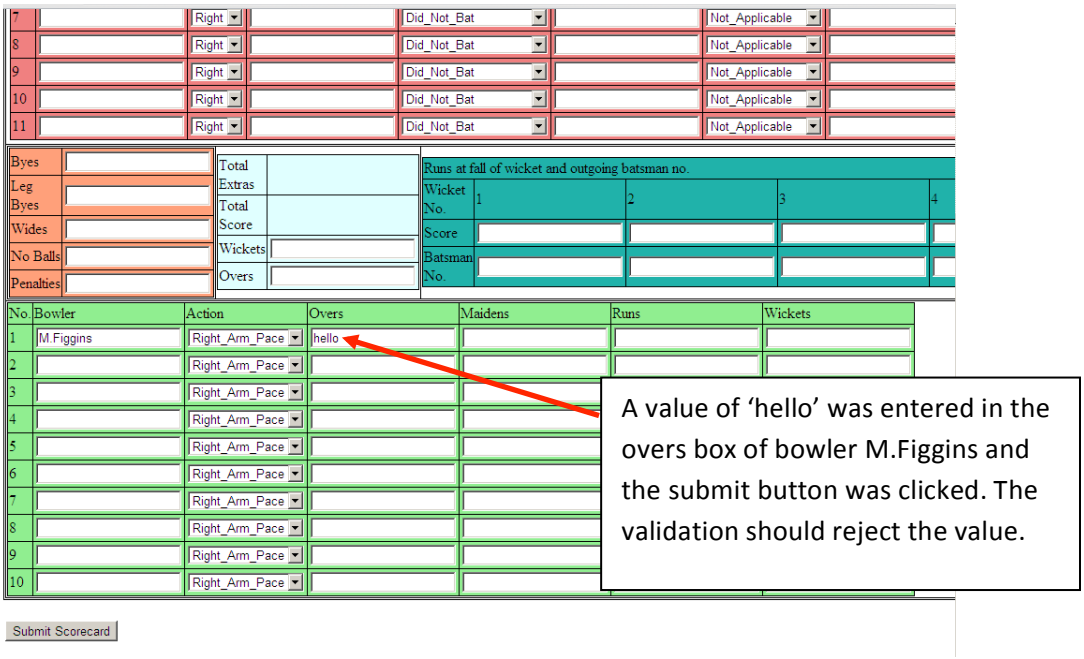
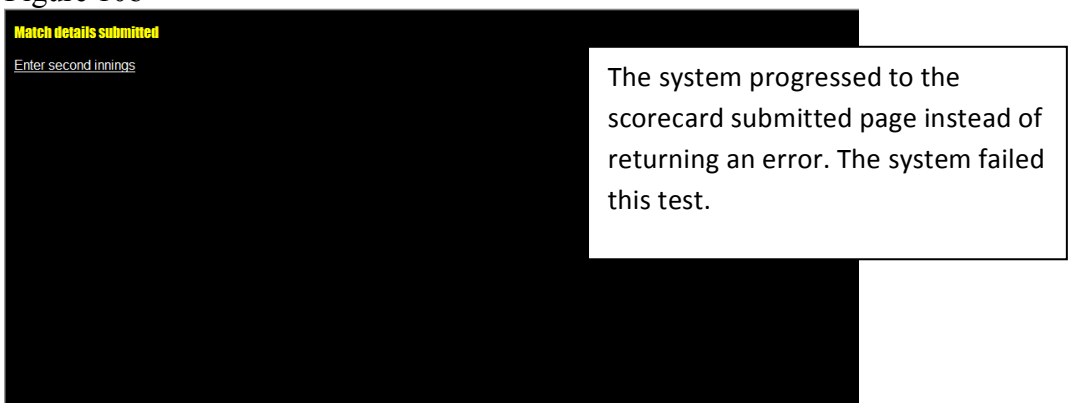


Figure 10b



Extreme/Boundary

Test 2.5

Figure 11a

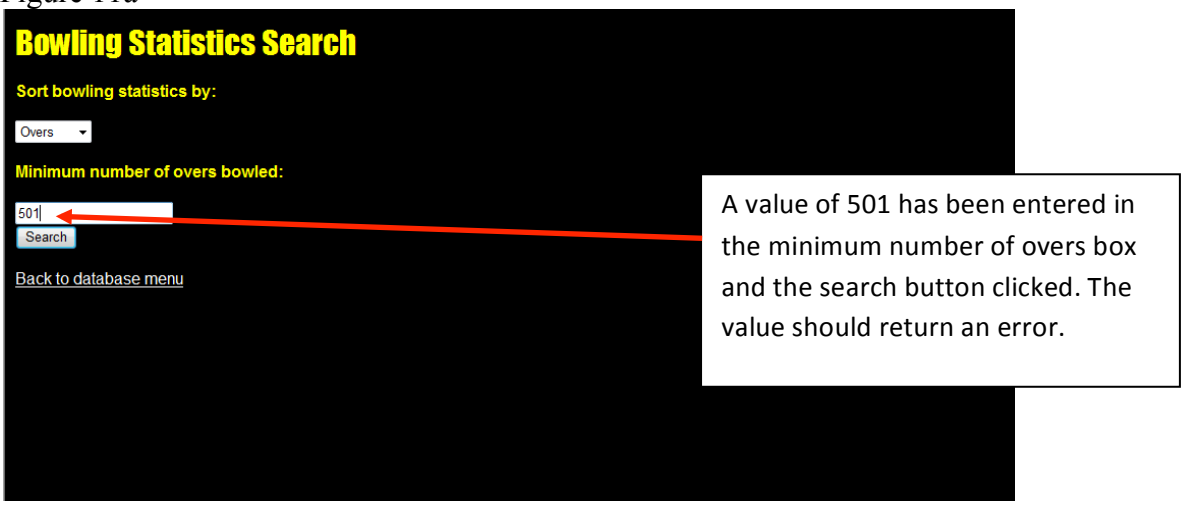
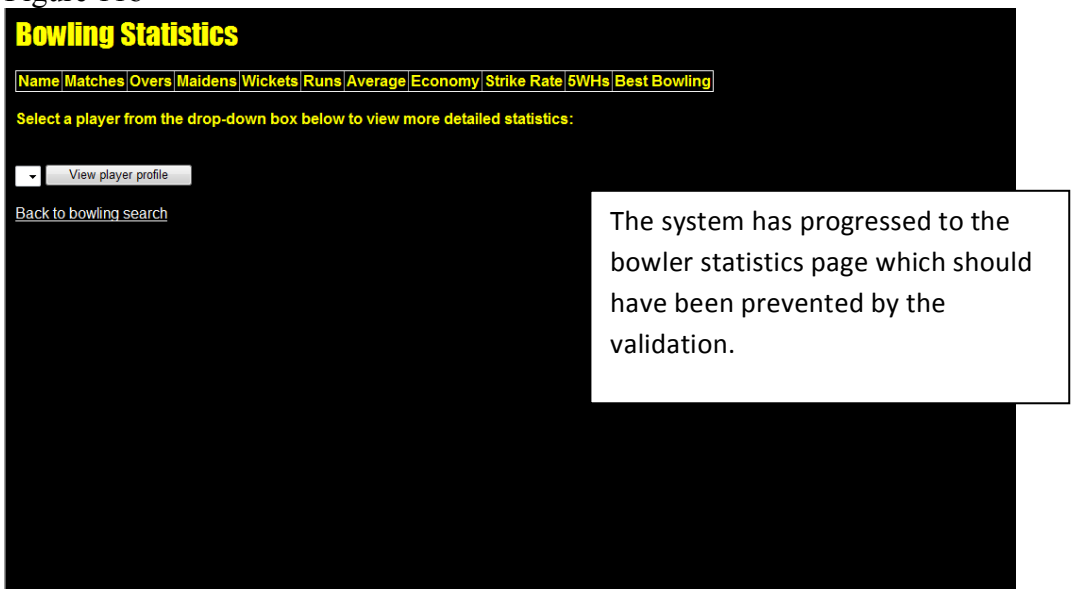


Figure 11b



Test 2.7

Figure 12a

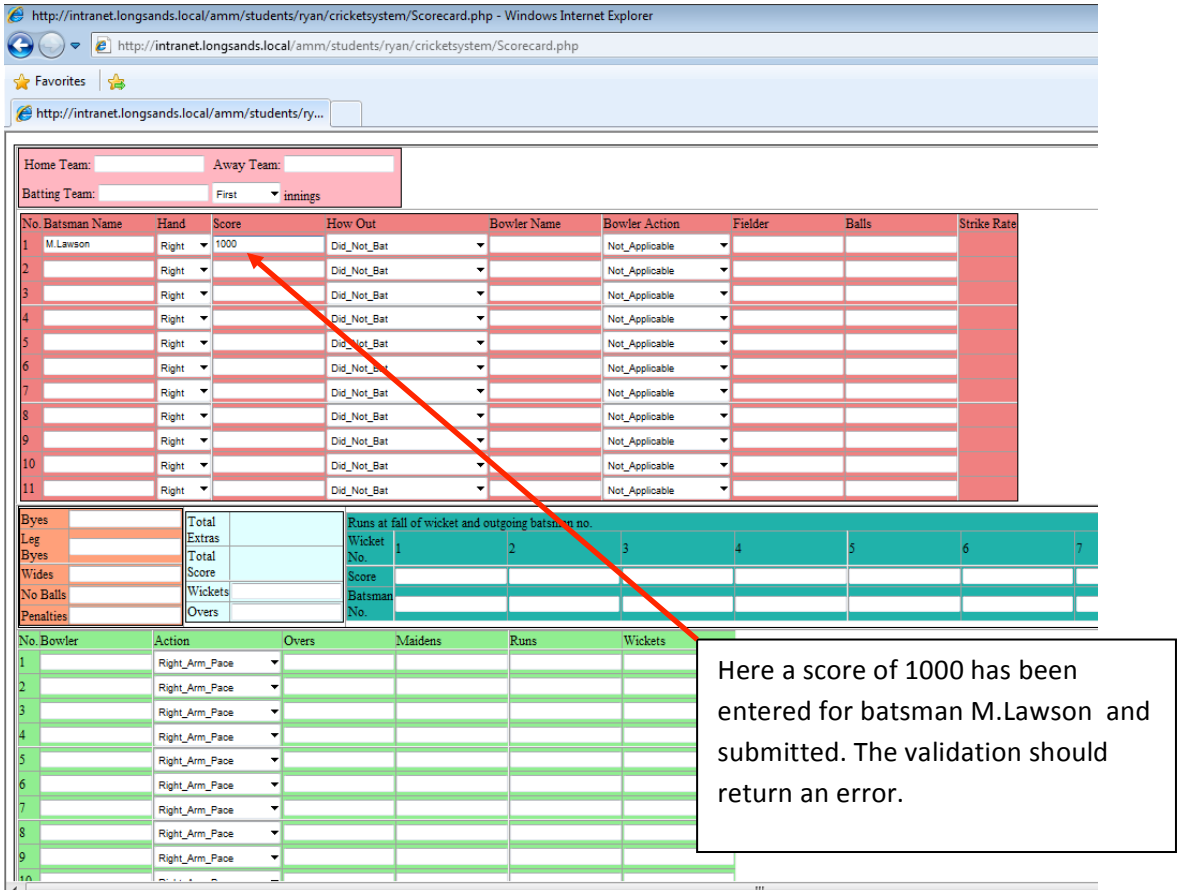
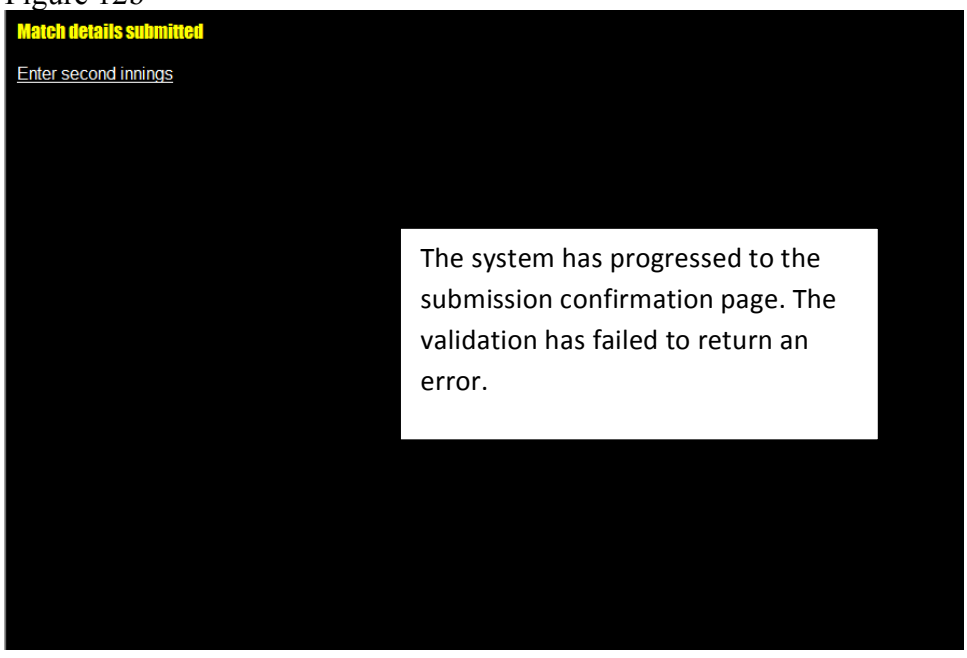


Figure 12b



4 – Evaluation

4.1 – Approach to Testing

In general I have chosen to take a mixed-level approach to testing. For example, the tests in series 1 are examples of white box tests to prove that the system can be moved through effectively by the user. Series 2 and 5 comprise of rigorous black box testing to ensure that the validation modules in the system are functioning correctly. Further black box testing is undertaken in series 4 to attempt to ensure that the system's mathematical functions are working as they are supposed to. Finally, series 6 and 7 are the overall system tests and tested whether the system worked I intended it and that it met the user's original specification which I am using as the yardstick for acceptance testing.

4.2 – Problems

My testing programme unearthed a number of problems with the system which are explained below, along with the measures I did (or didn't) take to eliminate these issues:

Test 7.1 – It proved impossible to meet my client's specification.

Obviously this is a major issue but due to the reasons explained previously I am unable to rectify this problem in the limited time available. This is an area that could be considered in the future updating of the system.

Test Series 2 – Erroneous and Extreme Testing

The first run of testing showed clearly that there was a serious problem with the validation of the scorecard form as it simply failed to return any errors. I will endeavour to correct this for the final edition of the testing.

Tests 5.2 and 5.3

The first run of these tests revealed an error whereby only wickets involving both a bowler and a fielder i.e. stumped and run out were being stored in the table. In response to this I undertook a debugging session. The error occurred because the system was attempting to store a blank string in the database in the FieldID or SpellID columns, which will only accept integers. To rectify this, I changed the program so the system stored a value of 'NULL' in the FieldID or SpellID columns in the database when there was no fielder or bowler involved in a dismissal.

4.3 – Strengths

The main strengths of my testing programme are the rigorous testing of the mathematical components of my system which proved robust and effective and the rigorous interface testing which proved that my system can be navigated effectively. I was also able to rectify the issue with storing various types of dismissal and can relatively safely conclude that the modules for transferring data to and from the database are effective and as robust on an individual level.

4.4 – Weaknesses

The main weakness of my testing programme was that due to the quantity of different input combinations possible in my scorecard, it was impossible to test all possible inputs, for example I neglected to test the more obscure dismissal methods such as obstructing the field thoroughly with many combinations of input simply because it comes up so rarely in genuine

matches and therefore was not worth strenuous testing on. This may have limited the ability of my testing programme to identify specific errors relating to particular dismissal methods. I also neglected to test some of the links back to previous pages on the system because they all use similar HTML code and therefore if the url source is correct then all of the links will work correctly. However, this means I cannot prove that the user interface is completely robust.

4.5 – Reliability

If provided with accurate data I believe that my testing has proved that my system is largely reliable. Only one error on tests 5.2 and 5.3 was found and it has been rectified. Therefore all data input and output works as expected now and is displayed as it should be. However, the system is not completely reliable because the validation is not functioning on the scorecard page. The system should still process it in the expected manner but obviously the data stored will be inaccurate, or players will be missed off the database if the data enterd is of the wrong datatype. Therefore, although the system itself is generally reliable it is only as effective as the data input is accurate.

4.6 – Robustness

My testing programme has also proved that my system is quite robust. At no point during my programme did it crash or go into infinite loops. It is conceivable that a particular kind of data entry of the wrong kind in the wrong field could cause the system to crash, but I have not found out how this might occur during implementation or during the tesing of my system.