**Test Cases – Iteration 4**

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| **S/N** | **Functionality** | **Description** | **Test Inputs** | **Test Procedure** | **Expected Results** | **Actual Results** | **Pass/Fail** |
| 1 | Login | Validation of student is logged in will be successfully when they enter the correct for both email id and password. | Email Id: sean.tan.2011  Password: asdf0000 | Enter student id and password into input text fields provided at the login menu. | Login successful.  Welcome page is displayed. | Student is logged in | Pass |
| 2 | Login | Validation of student is not logged in will be successfully when they enter the incorrect email id and correct password. | Email Id: 123456  Password: asdf0000 | Enter student id and password into input text fields provided at the login menu. | Login unsuccessful.  Re-directs the student to login page. An error message will be displayed and student is asked to re-enter email and password. | Wrong email id/password error message is alerted to the student | Pass |
| 3 | Login | Validation of student is not logged in will be successfully when they enter the correct email id and incorrect password. | Email Id: sean.tan.2011  Password: abcdefgh | Enter student id and password into input text fields provided at the login menu. | Login unsuccessful.  Re-directs the student to login page. An error message will be displayed and student is asked to re-enter email and password. | Wrong email id/password error message is alerted to the student | Pass |
| 4 | Login | Validation of student is not logged in will be successfully when they leave email id empty and enter correct password. | Email Id:  Password: asdf0000 | Leave the student id empty and enter the password into input text fields provided at the login menu. | Login unsuccessful.  Re-directs the student to login page. An error message will be displayed and student is asked to re-enter email and password. | Wrong email id/password error message is alerted to the student | Pass |
| 5 | Login | Validation of student is not logged in will be successfully when they enter the correct email id and leave the password empty. | Email Id: sean.tan.2011  Password: | Enter student id and leave the password empty in the input text fields provided at the login menu. | Login unsuccessful.  Re-directs the student to login page. An error message will be displayed and student is asked to re-enter email and password. | Wrong email id/password error message is alerted to the student | Pass |
| 6 | Login | Validation is successful when student has been logged in before re-direction to the welcome.jsp. | ……/SMUA/home.jsp | Enter “welcome.jsp” in the url of a browser. | Student will be redirected to the login page. | Student is redirected back to the login page | Pass |
| 7 | Logout | Validation is successful when logged in student is successfully logged out. | Student clicks on the ‘Logout’ button | Student has successfully logged in and clicks on the logout button. | Logout is successful.  Student is redirected to login page. | Student is redirected back to login page. | Pass |

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| **S/N** | **Functionality** | **Description** | **Test Inputs** | **Test Procedure** | **Expected Results** | **Actual Results** | **Pass/Fail** |
| 1 | Bootstrap (Validate zip file) | Validate that the file is of zip extension | 001.jpg | Load .jpg into database | Page returns with an error message | The .jpg file cannot be selected | Pass |
| 2 | Bootstrap (Validate common csv files) | Validate that the file has no blank fields | app-lookup.csv  demographics.csv  app.csv | Load a .zip file containing listed .csv files | The erroneous row is discarded with no further validations on the row required; display number of rows discarded | The error messages are successfully printed out | Pass |
| 3 | Bootstrap (Validate demographics.csv) | Validate the mac-address to be a 40-digit hexadecimal number | 713hsiasd23ih34  12321$#@$! | Load a .zip file containing demographics.csv | Return error message “invalid mac-address” | Error messages are returned with information “invalid mac-address” | Pass |
| 4 | Bootstrap (Validate demographics.csv) | Validate the student’s name (cannot contain numbers or symbols) | Tan88  $$Money | Load a .zip file containing demographics.csv | Return error message “invalid name” | Error messages are returned with information “invalid name” | Pass |
| 5 | Bootstrap (Validate demographics.csv) | Validate the student’s password (Must be more than 8 char and cannot contain white spaces) | Asdfg  Qwe rt y | Load a .zip file containing demographics.csv | Return error message “invalid password” | Error messages are returned with information “invalid password” | Pass |
| 6 | Bootstrap (Validate demographics.csv) | Validate the student’s email (must contain xxx.<year>@<school>.smu.edu.sg)  Year between 2011-2015  Xxx should contain only letters | [Testing.2010@sis.smu.edu.sg](mailto:Testing.2010@sis.smu.edu.sg)  [Testing.2016@sis.smu.edu.sg](mailto:Testing.2016@sis.smu.edu.sg)  [Noschool.2014@nothing.smu.edu.sg](mailto:Noschool.2014@nothing.smu.edu.sg)  [Name464.2013@accountancy.smu.edu.sg](mailto:Name464.2013@accountancy.smu.edu.sg)  Dumb!.2013@business.smu.edu.sg | Load a .zip file containing demographics.csv | Return error message “invalid email” | Error messages are returned with information “invalid email” | Pass |
| 7 | Bootstrap (Validate demographics.csv) | Validate the student’s gender (either F or M, case sensitive) | G  Female  Male  m | Load a .zip file containing demographics.csv | Return error message “invalid gender” | Error messages are returned with information “invalid email” when input is m/f | Pass |
| 8 | Bootstrap (Validate app-lookup.csv) | Validate the app-id (unique identifier, must be positive non-zero integer) | -23  0  A123 | Load a .zip file containing app-lookup.csv.csv | Return error message “invalid app-id” | Error messages are returned with information “invalid app-id” | Pass |
| 9 | Bootstrap (Validate app-lookup.csv) | Validate the app-category (can only be predefined categorical values) | Fun  123  Local! | Load a .zip file containing app-lookup.csv.csv | Return error message “invalid app-category” | Error messages are returned with information “invalid app-category” | Pass |
| 10 | Bootstrap (Validate app.csv) | Validate the app-id (must be in app-lookup.csv) | 999  500#  App123 | Load a .zip file containing app-lookup.csv.csv | Return error message “invalid app-id” | Error messages are returned with information “invalid app-id” | Pass |
| 11 | Bootstrap (Validate app.csv) | Validate the mac-address to be a 40-digit hexadecimal number | 8138wbdfh8r23427dsa  28eh3rffas#\*$@#&%(@#E(@#DH!## | Load a .zip file containing app.csv | Return error message “invalid mac-address” | Error messages are returned with information “invalid mac-address” | Pass |
| 12 | Bootstrap (Validate app.csv) | Validate mac-address (must be in demographics.csv) | 3776412bsajdhjad89212312312312sadasdjbejbasdassdasd  #@%@#duashdiasne1bj2hveqwe123131 | Load a .zip file containing app.csv | Return error message “no matching mac-address” | Error messages are returned with information “no matching mac-address” | Pass |
| 13 | Bootstrap (Validate app.csv) | Validate timestamp (format of date and time YYYY-MM-DD HH:MM:SS) | 1994-13-34 43:11:32  Tsaesdanq123  2014-10-33 12:10:20  2014-10-22 12:10:61 | Load a .zip file containing app.csv | Return error message “invalid timestamp” | Error message is returned when input value is 1994-13-34 3:11:32 | Pass |
| 14 | Bootstrap (Validate app.csv) | Validate duplicate rows (records with same values) | (duplicate rows) | Load a .zip file containing app.csv | Return error message “duplicate row” | Error messages are returned with information “duplicate row” | Pass |
| 15 | Bootstrap : Add additional data (demographics.csv) | Validation of additional demographics.csv which follows the same logic as bootstrap | Mac-address = “1212324234”  Password = “fd s a 1 2132”  Email = [roy.dai.2017@accountancy.smu.edu.sg](mailto:roy.dai.2017@accountancy.smu.edu.sg)  Gender = “female”  CCA = “ghewgjkfehjfkewhjfkehfjkefgejhfgewfhjewgffegwfjkefgejkfewjkfefbjewkfebwjkfewbfejkwfbewjfbewjkfewbjekwbfjewbfewjkfbwejkfbewjkfbewjfkwbfjkewfbewjkfbewjkfbewjkfbewjkewbfjkewbfjkewbewjkfbewjkfbewjkfewbfjkewbfjewbewjkfebwjkfewbfjkebfjewbfejwbfewjkfbjewbfjkewfbewjkfbewjkfewbfjkewbfjkewbfewkjfewhfvehjfvehjfwvhjfwevhjwvfhjewvfjhwefvewhjfvwehjfvefhjewvfhjwevejw” | Load a new zip file named “additional data” which consists of “demographics.csv” | Return corresponding error message for each different case of validation. | Various error message information is displayed in different cases:  “invalid mac-address”  “invalid password”  “invalid email”  “invalid gender”  “invalid CCA” | Pass |
| 16 | Bootstrap : Add additional data (demographics.csv) | Validation of additional demographics.csv which owns the correct format | Correct input in the right format | Load a new zip file named “additional data” which consists of “demographics.csv” | Display a message which indicates “successfully added” | userDAO is updated, new data inserted successfully | Pass |
| 17 | Bootstrap: Add additional data (app.csv) | Validation of additional app.csv which follows the same logic as bootstrap with different issues | Timestamp = “2015-04- 07 99:99:99”  Mac-address = “1324334545654645”  (use a duplicate role)  app-id = “abc123” | Load a new zip file named “additional data” which consists of “app.csv” | Return corresponding error message for each different case of validation. | Various error message information is displayed in different cases:  “Invalid timestamp”  “Invalid mac-address”  “duplicate row”  “Invalid app-id” | Pass |
| 18 | Bootstrap: Add additional data (app.csv) | Validation additional app.csv which owns the correct format | Correct input in the right format | Load a new zip file named “additional data” which consists of “app.csv” | Display a message which indicates “successfully added” | AppDAO is updated, new data inserted successfully | Pass |

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| **S/N** | **Functionality** | **Description** | **Test Inputs** | **Test Procedure** | **Expected Results** | **Actual Results** | **Pass/Fail** |
| 1 | Basic App Usage Report: Breakdown by time usage | Validation report is display with valid start date and end date within the app usage timestamp | Date format (yyyy-MM-dd hh:MM:ss)  Start date: 2015-04-06 00:00:00  End date: 2015-04-07 00:00:00 | Select start date and end date into readable only input text fields provided at the Breakdown by time usage. | View report successful.  Redirect user to Breakdown by time usage page. Display time usage report of type of users (intense, normal, mild), number of that users and percentage | Display time usage report of type of users (intense, normal, mild), number of that users and percentage | Pass |
| 2 | Basic App Usage Report: Breakdown by time usage | Validation start date is before end date | Date format (yyyy-MM-dd hh:MM:ss)  Start date: 2015-04-07 00:00:00  End date: 2015-04-06 00:00:00 | Select start date and end date into readable only input text fields provided at the Breakdown by time usage. | View report unsuccessful.  Redirect user to Breakdown by time usage page. An error message is displayed and user is told that start date must be before end date | Start date must be after End date error message is alerted to the user | Pass |
| 3 | Basic App Usage Report: Breakdown by time usage | Validation app usage timestamp is after start date and before end date | Date format (yyyy-MM-dd hh:MM:ss)  Start date: 2015-04-04 00:00:00  End date: 2015-04-05 00:00:00 | Select start date and end date into readable only input text fields provided at the Breakdown by time usage. | View report unsuccessful.  Redirect user to Welcome page. A message is displayed and user is told that there is no record shown | Shows 0 users if selected dates contain no data | Pass |
| 4 | Basic App Usage Report: Breakdown by time usage & demographics | Displaying results categorized by year | Select “year” as the first choice in the category | If year is selected, usage report should be categorized by administrative years (from 2011 - 2015) | Redirect to the same page:  If year is selected, the results will be categorized by year. | Results are categorized by year. | Pass |
| 5 | Basic App Usage Report: Breakdown by time usage & demographics | Displaying results categorized by gender | Select “gender” as the first choice in the category | If gender is selected, usage report should be categorized by the total number and percentage of gender (‘M’ and ‘F’) | Redirect to the same page:  If gender is selected, the results will be categorized by gender. | Results are categorized by gender. | Pass |
| 6 | Basic App Usage Report: Breakdown by time usage & demographics | Displaying results categorized by school | Select “school” as the first choice in the category | If school is selected, usage report should be categorized by the total number and percentage of school ("sis", "economics", "socsc", "law", "accountancy", "business") | Redirect to the same page:  If school is selected, the results will be categorized by school. | Results are categorized by school. | Pass |
| 7 | Basic App Usage Report: Breakdown by time usage & demographics | Displaying results categorized by year, followed by gender | Select “year” as the first choice in the category, followed by selecting “gender” as the second choice in the category | When year is selected as the first choice, followed by “gender” as the second choice, the usage report should be categorized by administrative years (from 2011 - 2015), followed by gender (‘M’ or ‘F’) | Redirect to the same page:  The results will be categorized first by year, second by gender. | Results are categorized by year, then gender. | Pass |
| 8 | Basic App Usage Report: Breakdown by time usage & demographics | Displaying results categorized by year, followed by school | Select “year” as the first choice in the category, followed by selecting “school” as the second choice in the category | When year is selected as the first choice, followed by school as the second choice, the usage report should be categorized by administrative years (from 2011 - 2015), followed by school ("sis", "economics", "socsc", "law", "accountancy", "business") | Redirect to the same page:  The results will be categorized first by year, second by school. | Results are categorized by year, then school. | Pass |
| 9 | Basic App Usage Report: Breakdown by time usage & demographics | Displaying results categorized by gender, followed by year | Select “gender” as the first choice in the category, followed by selecting “year” as the second choice in the category | When gender is selected as the first choice, followed by year as the second choice, the usage report should be categorized by gender (‘M’ or ‘F’), followed by administrative years (from 2011 - 2015) | Redirect to the same page:  The results will be categorized first by gender, second by year. | Results are categorized by gender, then year. | Pass |
| 10 | Basic App Usage Report: Breakdown by time usage & demographics | Displaying results categorized by gender, followed by school | Select “gender” as the first choice in the category, followed by selecting “school” as the second choice in the category | When gender is selected as the first choice, followed by school as the second choice, the usage report should be categorized by gender (‘M’ or ‘F’), followed by school ("sis", "economics", "socsc", "law", "accountancy", "business") | Redirect to the same page:  The results will be categorized first by gender, second by school. | Results are categorized by gender, then school. | Pass |
| 11 | Basic App Usage Report: Breakdown by time usage & demographics | Displaying results categorized by school, followed by year | Select “school” as the first choice in the category, followed by selecting “year” as the second choice in the category | When school is selected as the first choice, followed by year as the second choice, the usage report should be categorized by school ("sis", "economics", "socsc", "law", "accountancy", "business"), followed by administrative years (from 2011 - 2015) | Redirect to the same page:  The results will be categorized first by school, second by year. | Results are categorized by school, then year. | Pass |
| 12 | Basic App Usage Report: Breakdown by time usage & demographics | Displaying results categorized by school, followed by gender | Select “school” as the first choice in the category, followed by selecting “gender” as the second choice in the category | When school is selected as the first choice, followed by gender as the second choice, the usage report should be categorized by school ("sis", "economics", "socsc", "law", "accountancy", "business"), followed by gender (‘M’ or ‘F’) | Redirect to the same page:  The results will be categorized first by school, second by gender. | Results are categorized by school, then gender. | Pass |
| 13 | Basic App Usage Report: Breakdown by time usage & demographics | Displaying results categorized by the first choice (year/gender/school), second choice (year/gender/school), & third choice (year/gender/school) based on what the user selected | Select “year/gender/school” as the first choice in the category, followed by selecting “year/gender/school” as the second choice in the category, and lastly selecting “year/gender/school” as the third choice | The usage report should be categorized by the first, second and third choices selected by the user | Redirect to the same page:  The results will be categorized according to the selection (first, second and third choice) from the user | Records does not display accordingly when 3 inputs are selected | Fail |
| 14 | Basic App Usage Report: Breakdown by time usage & demographics | Validation of not selecting any category of choices | Not selecting any choices provided in the page. | If no choice is selected in the drop-down list, an error message will be displayed to alert the user | Redirect to the same page:  Display an error message “No category was selected” | Error message displayed | Pass |
| 15 | Basic App Usage Report: Breakdown by time usage & demographics | Validation of selecting the same category of choices | Selecting the same choices provided in the page. Example:  First: Gender  Second: Gender  Third: Gender  OR  First: School  Second: Year  Third: Year  OR  First: Year  Second: School  Third: Year | If same choices are selected in the drop-down list, an error message will be displayed to alert the user | Redirect to the same page:  Display an error message “Duplicate choice. All choices must be different” | Error message displayed | Pass |
| 16 | Basic App Usage Report: Breakdown by time usage & demographics | Validation of selecting start date that is after end date | Selecting start date and end date provided in the page. | If start date is after end date, an error message will be displayed to alert the user | Redirect to the same page:  Display an error message “No record during this period OR invalid date input” | Error message displayed | Pass |
| 17 | Basic App Usage Report: Breakdown by time usage & demographics | Validation of selecting any category of choices and start date/end date that has no record | Selecting any choices, start date and end date correctly provided in the page. | If choices and dates are selected with no record found in the database, an error message will be displayed to alert the user | Redirect to the same page:  Display an error message “No record during this period OR invalid date input” | Error message displayed | Pass |
| 18 | Basic App Usage Report: Breakdown by app category | Validation report is display with valid start date and end date within the app usage timestamp | Date format (yyyy-MM-dd hh:MM:ss)  Start date: 2015-04-06 00:00:00  End date: 2015-04-07 00:00:00 | Select start date and end date into readable only input text fields provided at the Breakdown by app category. | View report successful.  Redirect user to Breakdown by time usage page. Display daily usage duration as well as the percentage of the total (0 would be displayed if there is no usage in an app category) | Results displayed as expected | Pass |
| 19 | Basic App Usage Report: Breakdown by app category | Validation report of invalid period of time input(does not overlap with the duration in app.csv) | Date format (yyyy-MM-dd hh:MM:ss)  Start date: 2015-04-06 00:00:00  End date: 2015-04-02 00:00:00 | Select start date and end date into readable only input text fields provided at the Breakdown by app category. | View report unsuccessful.  Redirect user to Breakdown by app category page. An error message is displayed and user is told that start date must be before end date | Error message displayed | Pass |
| 21 | Diurnal pattern of app usage time | Validation report from no selection of choice | No choice is selected | No selection of gender/year/school from the drop-down list input text fields provided at the Diurnal pattern of app usage time. | View report successful.  Redirect user to diurnal pattern app usage. Display records in diurnal pattern accordingly. | Results displayed as expected | Pass |
| 22 | Diurnal pattern of app usage time | Validation report from selection of a single choice | Gender: ‘M’ or ‘F’  OR  Year: “2011, 2012, 2013, 2014, 2015”  OR  School: "sis", "economics", "socsc", "law", "accountancy", "business” | Select gender/year/schol from the drop-down list input text fields provided at the Diurnal pattern of app usage time. | View report successful.  Redirect user to diurnal pattern app usage. Display records in diurnal pattern accordingly. | Results displayed as expected | Pass |
| 23 | Diurnal pattern of app usage time | Validation report from selection of two choices | Gender: ‘M’ or ‘F’  Year: “2011, 2012, 2013, 2014, 2015”  OR  Year: “2011, 2012, 2013, 2014, 2015”  School: "sis", "economics", "socsc", "law", "accountancy", "business”  OR  Gender: ‘M’ or ‘F’  School: "sis", "economics", "socsc", "law", "accountancy", "business” | Selection of two choices category: gender/year/school from the drop-down list input text fields provided at the Diurnal pattern of app usage time. | View report successful.  Redirect user to diurnal pattern app usage. Display records in diurnal pattern accordingly. | Results displayed as expected | Pass |
| 24 | Diurnal pattern of app usage time | Validation report from selection of three choices | Gender: ‘M’ or ‘F’  School: "sis", "economics", "socsc", "law", "accountancy", "business”  Year: “2011, 2012, 2013, 2014, 2015” | Selection of three choices category: gender/year/school from the drop-down list input text fields provided at the Diurnal pattern of app usage time | View report successful.  Redirect user to diurnal pattern app usage. Display records in diurnal pattern accordingly. | Display records in diurnal pattern of average app usage time accordingly to the selected category and on an hourly basis to calculate | Pass |

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| **S/N** | **Functionality** | **Description** | **Test Inputs** | **Test Procedure** | **Expected Results** | **Actual Results** | **Pass/Fail** |
| 1 | Top-k Usage Report: Top-k most used apps | Validation report is display with valid start date and end date within the app usage timestamp, k is an integer within the range from 1 – 10, school is selected from one of the schools. | Date format (yyyy-MM-dd hh:MM:ss)  Start date: 2015-04-06 00:00:00  End date: 2015-04-07 00:00:00  School name: SIS, SOE, LKCSB,SOA,SOL,SOSS  k = 1 ~ 10 | Select start date and end date into readable only input text fields provided at the App. | View report successful.  Redirect user to Top-k most used app web page. Display top-k apps for a certain school during certain period. | View report successfully.  The report result is displayed based on the input of the user. | Pass |
| 2 | Top-k Usage Report: Top-k most used apps | Validation start date is before end date | Date format (yyyy-MM-dd hh:MM:ss)  Start date: 2015-04-06 00:00:00  End date: 2015-04-07 00:00:00 | Select start date and end date into readable only input text fields provided at the App Usage by time usage. | View report unsuccessful.  Redirect user to Top-k app web page. An error message is displayed and user is told that start date must be before end date | Display list of possible error messages on the same jsp page | Pass |
| 3 | Top-k Usage Report: Top-k most used apps | Validation timestamp is after start date and before end date | Date format (yyyy-MM-dd hh:MM:ss)  Start date: 2015-04-06 00:00:00  End date: 2015-04-07 00:00:00 | Select start date and end date into readable only input text fields provided at the Breakdown by time usage. | View report unsuccessful.  Redirect user to Top-k app web page. A message is displayed and user is told that there is no record shown | Display list of possible error messages on the same jsp page | Pass |
| 4 | Top-k Usage Report: Top-k most used apps | Validation of input value of k | The value of k must be an integer which lies between 1 to 10 | Input k multiple times with negative value, double value | View report unsuccessful.  Redirect user to Top-k app web page. A message is displayed and user is told that k should be an integer which lies between 1 to 10 | K cannot be selected when a chosen value is not within the range of 1 – 10. | Pass |
| 5 | Top-k Usage Report: Top-k most used apps | Validation of not selecting start date and/or end date | Date format (yyyy-MM-dd hh:MM:ss)  Start date: dd - - - - yyyy  End date: dd - - - - yyyy | Enter top K and select school without selecting start date and/or end date | View report unsuccessful.  Redirect user to Top-k web page. An error message “You haven't entered the Start/End date” is displayed to the user. | Display list of possible error messages on the same jsp page | Pass |
| 6 | Top-k Usage Report: Top-k students with most used apps | Validation report is display with valid start date and end date within the app usage timestamp, k is an integer within the range from 1 – 10, school is selected from one of the schools. | Date format (yyyy-MM-dd hh:MM:ss)  Start date: 2015-04-06 00:00:00  End date: 2015-04-07 00:00:00  School name: SIS, SOE, LKCSB,SOA,SOL,SOSS  k = 1 ~ 10 | Select start date and end date into readable only input text fields provided at the App usage. | View report successful.  Redirect user to Top-k students with most used app web page. Display top-k students with longest period of app usage. | View report successful.  The report result is displayed on the same jsp page | Pass |
| 7 | Top-k Usage Report: Top-k students with most used apps | Validation start date is before end date | Date format (yyyy-MM-dd hh:MM:ss)  Start date: 2015-04-06 00:00:00  End date: 2015-04-07 00:00:00 | Select start date and end date into readable only input text fields provided at the App Usage by time usage. | View report unsuccessful.  Redirect user to Top-k students with app usage web page. An error message is displayed and user is told that start date must be before end date | Display list of possible error messages on the same jsp page | Pass |
| 8 | Top-k Usage Report: Top-k students with most used apps | Validation timestamp is after start date and before end date. Does not match the records in the database | Date format (yyyy-MM-dd hh:MM:ss)  Start date: 2015-04-06 00:00:00  End date: 2015-04-07 00:00:00 | Select start date and end date into readable only input text fields provided at the Breakdown by time usage. | View report unsuccessful.  Redirect user to Top-k students with app usage web page. A message is displayed and user is told that there is no record shown | Display list of possible error messages on the same jsp page | Pass |
| 9 | Top-k Usage Report: Top-k students with most used apps | Validation of input value of k | The value of k must be an integer which lies between 1 to 10 | Input k multiple times with negative value, double value | View report unsuccessful.  Redirect user to Top-k students with app usage web page. A message is displayed and user is told that k should be an integer which lies between 1 to 10 | K cannot be selected when a chosen value is not within the range of 1 – 10. | Pass |
| 10 | Top-k Usage Report: Top-k students with most used apps | Validation of not selecting start date and/or end date | Date format (yyyy-MM-dd hh:MM:ss)  Start date: dd - - - - yyyy  End date: dd - - - - yyyy | Enter top K and select school without selecting start date and/or end date | View report unsuccessful.  Redirect user to Top-k web page. An error message “You haven't entered the Start/End date” is displayed to the user. | Display list of possible error messages on the same jsp page | Pass |
| 11 | Top-k Usage Report: Top-k schools with most used apps | Validation report is display with valid start date and end date within the app usage timestamp, k is an integer within the range from 1 – 10, category is selected. | Date format (yyyy-MM-dd hh:MM:ss)  Start date: 2015-04-06 00:00:00  End date: 2015-04-07 00:00:00  School name: Book, Social, Education, Entertainment, Information, Library, Local, Tools, Fitness, Games, Others  k = 1 ~ 10 | Select start date and end date into readable only input text fields provided at the Top-k App usage. | View report successful.  Redirect user to Top-k students with most used app web page. Display top-k students with longest period of app usage. | View report successful.  The report result is displayed on the same jsp page | Pass |
| 12 | Top-k Usage Report: Top-k schools with most used apps | Validation start date is before end date | Date format (yyyy-MM-dd hh:MM:ss)  Start date: 2015-04-06 00:00:00  End date: 2015-04-07 00:00:00 | Select start date and end date into readable only input text fields provided at the App Usage by time usage. | View report unsuccessful.  Redirect user to Top-k students with app usage web page. An error message is displayed and user is told that start date must be before end date | Display list of possible error messages on the same jsp page | Pass |
| 13 | Top-k Usage Report: Top-k schools with most used apps | Validation timestamp is after start date and before end date. Does not match the records in the database | Date format (yyyy-MM-dd hh:MM:ss)  Start date: 2015-04-06 00:00:00  End date: 2015-04-07 00:00:00 | Select start date and end date into readable only input text fields provided at the Breakdown by time usage. | View report unsuccessful.  Redirect user to Top-k students with app usage web page. A message is displayed and user is told that there is no record shown | Display list of possible error messages on the same jsp page | Pass |
| 14 | Top-k Usage Report: Top-k schools with most used apps | Validation of input value of k | The value of k must be an integer which lies between 1 to 10 | Input k multiple times with negative value, double value | View report unsuccessful.  Redirect user to Top-k students with app usage web page. A message is displayed and user is told that k should be an integer which lies between 1 to 10 | K cannot be selected when a chosen value is not within the range of 1 – 10. | Pass |
| 15 | Top-k Usage Report: Top-k schools with most used apps | Validation of not selecting start date and/or end date | Date format (yyyy-MM-dd hh:MM:ss)  Start date: dd - - - - yyyy  End date: dd - - - - yyyy | Enter top K and select school without selecting start date and/or end date | View report unsuccessful.  Redirect user to Top-k web page. An error message “You haven't entered the Start/End date” is displayed to the user. | Display list of possible error messages on the same jsp page | Pass |

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| **S/N** | **Functionality** | **Description** | **Test Inputs** | **Test Procedure** | **Expected Results** | **Actual Results** | **Pass/Fail** |
| 1 | Smartphone Overuse Report | Validation report is display with valid start date and end date within the app usage timestamp  User has smartphone usage history | Date format (yyyy-MM-dd hh:MM:ss)  Start date: 2015-04-06 00:00:00  End date: 2015-04-07 00:00:00 | Select start date and end date into readable only input text fields provided. | View report successful.  Redirect user to Smartphone overuse report. Display Smartphone Overuse Report for a certain school during certain period. | The displayed output for smartphone overuse Report is 0.0 which is wrong | Fail |
| 2 | Smartphone Overuse Report | Validation of input date which is not within the range of csv | Date format (yyyy-MM-dd hh:MM:ss)  Start date: 2015-04-06 00:00:00  End date: 2015-04-07 00:00:00 | Select start date and end date which is different from any dates recorded in the csv file. | View report unsuccessful.  Redirect user to Smartphone Overuse Report web page. A message is displayed “No record shown” to the user | Display list of possible error messages on the same jsp page | Pass |
| 3 | Smartphone Overuse Report | Validation start date is before end date | Date format (yyyy-MM-dd hh:MM:ss)  Start date: 2015-04-06 00:00:00  End date: 2015-04-07 00:00:00 | Select start date and end date into readable only input text fields provided. | View report unsuccessful.  Redirect user to Smartphone Overuse Report web page. An error message is displayed “start date must be before end date” to the user | Display list of possible error messages on the same jsp page | Pass |
| 4 | Smartphone Overuse Report | Validation report is display with valid start date and end date within the app usage timestamp  User has no smartphone usage history userID: | Login as: emily.teo.2011  pw: asdf1181  Date format (yyyy-MM-dd hh:MM:ss)  Start date: 2015-04-06 00:00:00  End date: 2015-04-07 00:00:00 | Select start date and end date into readable only input text fields provided. | View report unsuccessful.  Redirect user to Smartphone overuse report. A message is displayed “No record shown” to the user | Display list of possible error messages on the same jsp page | Pass |
| 5 | Smartphone Overuse Report | Validation of user not selecting the start date and/or end date | Date format (yyyy-MM-dd hh:MM:ss)  Start date: dd - - - - yyyy  End date: dd - - - - yyyy | Not selecting start date and end date into readable only input text fields provided. | View report unsuccessful.  Redirect user to Smartphone Overuse Report web page. An error message is displayed “Invalid start date and/or end date” to the user | Display list of possible error messages on the same jsp page | Pass |

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| **S/N** | **Functionality** | **Description** | **Test Inputs** | **Test Procedure** | **Expected Results** | **Actual Results** | **Pass/Fail** |
| 1 | Loading Location Data functionality (upload additional location data) | Upload an invalid file - an empty non .zip file | Empty.zip | Click on "Choose File", browse and select the file and Open. Select the file and click on "Bootstrap" | Display error message “Invalid file type” to the user | Nothing displayed after bootstrap an empty zip file | Pass |
| 2 | Loading Location Data functionality (upload additional location data) | Upload an invalid file - a non .zip file | Testing.docx | Click on "Choose File", browse and select the file and Open. Select the file and click on "Bootstrap" | Display error message “Invalid file type” to the user | The file cannot be selected. | Pass |
| 3 | Loading Location Data functionality (upload additional location data) | Validate that bootstrap controller is able to read "demographics.csv", "app-lookup.csv", "app.csv" | A zip file contains "demographics.csv", "app-lookup.csv", "app.csv" within correct format | Upload the zip file | Upload of zip files successful | The file | Pass |
| 4 | Loading Location Data functionality (upload additional location data) | Validate that bootstrap is able to identify invalid semantic-place from location-lookup.csv | Semantic-place = “NUSPARKINGSPACE” | Upload the zip file | Upload of zip files successful. Display invalid of data row and row number in location-lookup.csv | “Invalid semantic-place” | Pass |
| 5 | Loading Location Data functionality (upload additional location data) | Validate that bootstrap controller is able to identify duplicate row error from location-lookup.csv | 1010100020,"SMUSISL1RECEPTION" (a duplicate row in location-lookup.csv) | Upload the zip file | Upload of zip files successful. Display duplication of data row and row number in location-lookup.csv | Error message: “duplicate row” | Pass |
| 6 | Loading Location Data functionality (upload additional location data) | Validate that bootstrap controller is able to identify empty field error from location-lookup.csv | Data is in the correct format without duplicate | Upload the zip file | Upload of zip files successful. Display invalid of empty data row and row number in location-lookup.csv | LocationLookupDAO is updated, new data successfully inserted into the database | Pass |

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| **S/N** | **Functionality** | **Description** | **Test Inputs** | **Test Procedure** | **Expected Results** | **Actual Results** | **Pass/Fail** |
| 1 | Deletion of Location Data | Validation of correct start date, end date and mac-address | Date format (yyyy-MM-dd hh:MM:ss)  Start date: 2015-04-06  End date: 2015-04-07  Mac-address: 8a41a1b03ef31d3eae51b73f853fb4fe6ebb5077 | Enter start date, end date and mac-address into input text fields provided at the Administrative page. | Display deleted successfully message “Location deleted successfully. 1 row has been deleted” | Display deleted successfully message “Location deleted successfully. 1 row has been deleted” | Pass |
| 2 | Deletion of Location Data | Validation of start date is after end date | Date format (yyyy-MM-dd hh:MM:ss)  Start date: 2015-04-09  End date: 2015-04-06  Mac-address:  8a41a1b03ef31d3eae51b73f853fb4fe6ebb5077 | Enter start date, end date and mac-address into input text fields provided at the Administrative page. | Display error message “Start date cannot be after end date” | Display error message “Start date cannot be after end date” | Pass |
| 3 | Deletion of Location Data | Validation of empty start date, end date and mac-address | Date format (yyyy-MM-dd hh:MM:ss)  Start date: dd - - - - yyyy  End date: dd - - - - yyyy  Mac-address: | No input of start date, end date and mac-address into input text fields provided at the Administrative page. | Display error message:  “Invalid start date”  “Invalid end date”  “Invalid mac-address” | Display error message:  “Invalid start date”  “Invalid end date”  “Invalid mac-address” | Pass |
| 4 | Deletion of Location Data | Validation of invalid mac-address | Date format (yyyy-MM-dd hh:MM:ss)  Start date: 2015-04-09  End date: 2015-04-06  Mac-address:  1a1a1a1a1a1a1a1a1a1a1a1a1a1a1a1a1a1a1a1a  AND  Date format (yyyy-MM-dd hh:MM:ss)  Start date: 2015-04-09  End date: 2015-04-06  Mac-address:  8a41a1b0 | Enter start date, end date and mac-address into input text fields provided at the Administrative page. | Display error message:  “Invalid mac-address” | Display error message:  “Invalid mac-address” | Pass |
| 5 | Deletion of Location Data | Validation of empty start date | Date format (yyyy-MM-dd hh:MM:ss)  Start date: dd - - - - yyyy  End date: 2015-04-07  Mac-address: 8a41a1b03ef31d3eae51b73f853fb4fe6ebb5077 | Enter end date and mac-address into input text fields provided at the Administrative page. | Display error message:  “Invalid start date” | Display error message:  “Invalid start date” | Pass |
| 6 | Deletion of Location Data | Validation of empty end date | Date format (yyyy-MM-dd hh:MM:ss)  Start date: 2015-04-06  End date: dd - - - - yyyy  Mac-address: 8a41a1b03ef31d3eae51b73f853fb4fe6ebb5077 | Enter start date and mac-address into input text fields provided at the Administrative page. | Display error message:  “Invalid end date” | Display error message:  “Invalid end date” | Pass |
| 7 | Deletion of Location Data | Upload an invalid file - an empty non .zip file | Delete\_Empty.zip | Click on "Choose File", browse and select the file and Open. Select the file and click on "Delete" | Display message “0 record(s) is deleted” to the user | Display message “0 record(s) is deleted” to the user | Pass |
| 8 | Deletion of Location Data | Upload an invalid file - a non .zip file | Testing.docx | Click on "Choose File", browse and select the file and Open. Select the file and click on "Delete" | Display error message “Invalid file type” to the user | Display error message “Invalid file type” to the user | Pass |
| 9 | Deletion of Location Data | Upload a valid deletion file | Delete.zip | Click on "Choose File", browse and select the file and Open. Select the file and click on "Delete" | Display message “1 record(s) is deleted” to the user | Display message “1 record(s) is deleted” to the user | Pass |
| 10 | Deletion of Location Data | Upload a valid deletion file with invalid data in the csv | Delete\_with\_invalid\_data.zip | Click on "Choose File", browse and select the file and Open. Select the file and click on "Delete" | Display message “0 record(s) is deleted” to the user | Display message “0 record(s) is deleted” to the user | Pass |

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| **S/N** | **Functionality** | **Description** | **Test Inputs** | **Test Procedure** | **Expected Results** | **Actual Results** | **Pass/Fail** |
| 1 | JSON for Login | Validation of student is logged in will be successfully when they enter the correct for both email id and password. | URL Token | Input the URL on the browser |  |  |  |
| 2 | JSON for Login | Validation of student is not logged in will be successfully when they enter the incorrect email id and correct password. | URL Token | Input the URL on the browser |  |  |  |
| 3 | JSON for Login | Validation of student is not logged in will be successfully when they enter the correct email id and incorrect password. | URL Token | Input the URL on the browser |  |  |  |
| 4 | JSON for Login | Validation of student is not logged in will be successfully when they leave email id empty and enter correct password. | URL Token | Input the URL on the browser |  |  |  |
| 5 | JSON for Login | Validation of student is not logged in will be successfully when they enter the correct email id and leave the password empty. | URL Token | Input the URL on the browser |  |  |  |

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| **S/N** | **Functionality** | **Description** | **Test Inputs** | **Test Procedure** | **Expected Results** | **Actual Results** | **Pass/Fail** |
| 1 | JSON API for Basic App Usage Report: Breakdown by time usage | Validation report is display with valid start date and end date within the app usage timestamp | URL Token | Input the URL on the browser |  |  |  |
| 2 | JSON API for Basic App Usage Report: Breakdown by time usage | Validation start date is before end date | URL Token | Input the URL on the browser |  |  |  |
| 3 | JSON API for Basic App Usage Report: Breakdown by time usage | Validation app usage timestamp is after start date and before end date | URL Token | Input the URL on the browser |  |  |  |
| 4 | JSON API for Basic App Usage Report: Breakdown by time usage & demographics | Displaying results categorized by year | URL Token | Input the URL on the browser |  |  |  |
| 5 | JSON API for Basic App Usage Report: Breakdown by time usage & demographics | Displaying results categorized by gender | URL Token | Input the URL on the browser |  |  |  |
| 6 | JSON API for Basic App Usage Report: Breakdown by time usage & demographics | Displaying results categorized by school | URL Token | Input the URL on the browser |  |  |  |
| 7 | JSON API for Basic App Usage Report: Breakdown by time usage & demographics | Displaying results categorized by year, followed by gender | URL Token | Input the URL on the browser |  |  |  |
| 8 | JSON API for Basic App Usage Report: Breakdown by time usage & demographics | Displaying results categorized by year, followed by school | URL Token | Input the URL on the browser |  |  |  |
| 9 | JSON API for Basic App Usage Report: Breakdown by time usage & demographics | Displaying results categorized by gender, followed by year | URL Token | Input the URL on the browser |  |  |  |
| 10 | JSON API for Basic App Usage Report: Breakdown by time usage & demographics | Displaying results categorized by gender, followed by school | URL Token | Input the URL on the browser |  |  |  |
| 11 | JSON API for Basic App Usage Report: Breakdown by time usage & demographics | Displaying results categorized by school, followed by year | URL Token | Input the URL on the browser |  |  |  |
| 12 | JSON API for Basic App Usage Report: Breakdown by time usage & demographics | Displaying results categorized by school, followed by gender | URL Token | Input the URL on the browser |  |  |  |
| 13 | JSON API for Basic App Usage Report: Breakdown by time usage & demographics | Displaying results categorized by the first choice (year/gender/school), second choice (year/gender/school), & third choice (year/gender/school) based on what the user selected | URL Token | Input the URL on the browser |  |  |  |
| 14 | JSON API for Basic App Usage Report: Breakdown by time usage & demographics | Validation of not selecting any category of choices | URL Token | Input the URL on the browser |  |  |  |
| 15 | JSON API for Basic App Usage Report: Breakdown by time usage & demographics | Validation of selecting the same category of choices | URL Token | Input the URL on the browser |  |  |  |
| 16 | JSON API for Basic App Usage Report: Breakdown by time usage & demographics | Validation of selecting start date that is after end date | URL Token | Input the URL on the browser |  |  |  |
| 17 | JSON API for Basic App Usage Report: Breakdown by time usage & demographics | Validation of selecting any category of choices and start date/end date that has no record | URL Token | Input the URL on the browser |  |  |  |
| 18 | JSON API for Basic App Usage Report: Breakdown by app category | Validation report is display with valid start date and end date within the app usage timestamp | URL Token | Input the URL on the browser |  |  |  |
| 19 | JSON API for Basic App Usage Report: Breakdown by app category | Validation report of invalid period of time input(does not overlap with the duration in app.csv) | URL Token | Input the URL on the browser |  |  |  |
| 21 | JSON API for Diurnal pattern of app usage time | Validation report from no selection of choice | URL Token | Input the URL on the browser |  |  |  |
| 22 | JSON API for Diurnal pattern of app usage time | Validation report from selection of a single choice | URL Token | Input the URL on the browser |  |  |  |
| 23 | JSON API for Diurnal pattern of app usage time | Validation report from selection of two choices | URL Token | Input the URL on the browser |  |  |  |
| 24 | JSON API for Diurnal pattern of app usage time | Validation report from selection of three choices | URL Token | Input the URL on the browser |  |  |  |

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| **S/N** | **Functionality** | **Description** | **Test Inputs** | **Test Procedure** | **Expected Results** | **Actual Results** | **Pass/Fail** |
| 1 | JSON API for Top-k Usage Report: Top-k most used apps | Validation report is display with valid start date and end date within the app usage timestamp, k is an integer within the range from 1 – 10, school is selected from one of the schools. | URL Token | Input the URL on the browser |  |  |  |
| 2 | JSON API for Top-k Usage Report: Top-k most used apps | Validation start date is before end date | URL Token | Input the URL on the browser |  |  |  |
| 3 | JSON API for Top-k Usage Report: Top-k most used apps | Validation timestamp is after start date and before end date | URL Token | Input the URL on the browser |  |  |  |
| 4 | JSON API for Top-k Usage Report: Top-k most used apps | Validation of input value of k | URL Token | Input the URL on the browser |  |  |  |
| 5 | JSON API for Top-k Usage Report: Top-k most used apps | Validation of not selecting start date and/or end date | URL Token | Input the URL on the browser |  |  |  |
| 6 | JSON API for Top-k Usage Report: Top-k students with most used apps | Validation report is display with valid start date and end date within the app usage timestamp, k is an integer within the range from 1 – 10, school is selected from one of the schools. | URL Token | Input the URL on the browser |  |  |  |
| 7 | JSON API for Top-k Usage Report: Top-k students with most used apps | Validation start date is before end date | URL Token | Input the URL on the browser |  |  |  |
| 8 | JSON API for Top-k Usage Report: Top-k students with most used apps | Validation timestamp is after start date and before end date. Does not match the records in the database | URL Token | Input the URL on the browser |  |  |  |
| 9 | JSON API for Top-k Usage Report: Top-k students with most used apps | Validation of input value of k | URL Token | Input the URL on the browser |  |  |  |
| 10 | JSON API for Top-k Usage Report: Top-k students with most used apps | Validation of not selecting start date and/or end date | URL Token | Input the URL on the browser |  |  |  |
| 11 | JSON API for Top-k Usage Report: Top-k schools with most used apps | Validation report is display with valid start date and end date within the app usage timestamp, k is an integer within the range from 1 – 10, category is selected. | URL Token | Input the URL on the browser |  |  |  |
| 12 | JSON API for Top-k Usage Report: Top-k schools with most used apps | Validation start date is before end date | URL Token | Input the URL on the browser |  |  |  |
| 13 | JSON API for Top-k Usage Report: Top-k schools with most used apps | Validation timestamp is after start date and before end date. Does not match the records in the database | URL Token | Input the URL on the browser |  |  |  |
| 14 | JSON API for Top-k Usage Report: Top-k schools with most used apps | Validation of input value of k | URL Token | Input the URL on the browser |  |  |  |
| 15 | JSON API for Top-k Usage Report: Top-k schools with most used apps | Validation of not selecting start date and/or end date | URL Token | Input the URL on the browser |  |  |  |

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| **S/N** | **Functionality** | **Description** | **Test Inputs** | **Test Procedure** | **Expected Results** | **Actual Results** | **Pass/Fail** |
| 1 | JSON API for Smartphone Overuse Report | Validation report is display with valid start date and end date within the app usage timestamp  User has smartphone usage history | URL Token | Input the URL on the browser |  |  |  |
| 2 | JSON API for Smartphone Overuse Report | Validation of input date which is not within the range of csv | URL Token | Input the URL on the browser |  |  |  |
| 3 | JSON API for Smartphone Overuse Report | Validation start date is before end date | URL Token | Input the URL on the browser |  |  |  |
| 4 | JSON API for Smartphone Overuse Report | Validation report is display with valid start date and end date within the app usage timestamp  User has no smartphone usage history userID: | URL Token | Input the URL on the browser |  |  |  |
| 5 | JSON API for Smartphone Overuse Report | Validation of user not selecting the start date and/or end date | URL Token | Input the URL on the browser |  |  |  |

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| **S/N** | **Functionality** | **Description** | **Test Inputs** | **Test Procedure** | **Expected Results** | **Actual Results** | **Pass/Fail** |
| 1 | Social Activeness Report | Validation of error message when no date is selected | dd/mm/yyyy | User does not select a date | Print error message |  |  |
| 2 | Social Activeness Report | Validates that total time spent is 0 when no data exists in selected date | 01/10/2016 | User selects a date with no data | The total usage time of applications in “Social” category: 0.0 min  The total time spent in the SIS building: 0.0 |  |  |
| 3 | Social Activeness Report | Validates correct output | 06/04/2015 | User selects a date with data |  |  |  |
| 4 | Social Activeness Report |  |  |  |  |  |  |
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| **S/N** | **Functionality** | **Description** | **Test Inputs** | **Test Procedure** | **Expected Results** | **Actual Results** | **Pass/Fail** |
| 1 | Smartphone Usage Heatmap | Validation of error message when no date is selected | dd/mm/yyyy | User does not select a date | Print error message |  |  |
| 2 | Smartphone Usage Heatmap | Validates that number of people and density is zero when date contains no data | 01/10/2016 | User selects a date with no data | Output 0 for all columns |  |  |
| 3 | Smartphone Usage Heatmap | Validates correct output | Basement 1  06/04/2015  02:00 PM | User selects a date with data |  |  |  |
| 4 | Smartphone Usage Heatmap | Validates correct output | Level 1  06/04/2015  02:30 PM | User selects a date with data |  |  |  |
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| **S/N** | **Functionality** | **Description** | **Test Inputs** | **Test Procedure** | **Expected Results** | **Actual Results** | **Pass/Fail** |
| 1 | JSON API for Smartphone Usage Heatmap | Validation report is display with valid date within the app usage timestamp  User has smartphone usage history | URL Token | Input the URL on the browser |  |  |  |
| 2 | JSON API for Smartphone Usage Heatmap | Validation of input date which is not within the range of csv | URL Token | Input the URL on the browser |  |  |  |
| 3 | JSON API for Smartphone Usage Heatmap | Validation of input for invalid location | URL Token | Input the URL on the browser |  |  |  |
| 4 | JSON API for Smartphone Usage Heatmap | Validation of user not selecting the date | URL Token | Input the URL on the browser |  |  |  |

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| **S/N** | **Functionality** | **Description** | **Test Inputs** | **Test Procedure** | **Expected Results** | **Actual Results** | **Pass/Fail** |
| 1 | JSON API for Social Activeness Report | Validation report is display with valid date within the app usage timestamp  User has smartphone usage history | URL Token | Input the URL on the browser |  |  |  |
| 2 | JSON API for Social Activeness Report | Validation of input date which is not within the range of csv | URL Token | Input the URL on the browser |  |  |  |
| 4 | JSON API for Social Activeness Report | Validation of user not selecting the date | URL Token | Input the URL on the browser |  |  |  |