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| **S/N** | **Test Case** | **Test Inputs** | **Test Procedure** | | **Expected Results** | **Actual Results**  **(Pass/Fail)** |
| **0** | **Basic Bootstrap** | **uat-data1.zip**  **Admin credential (provided by team)** | 1. Login to the admin interface 2. Bootstrap the zip file uat-data1.zip | | A message that the data is uploaded correctly (there should be no error messages printed).   |  |  | | --- | --- | | File | # of Records Loaded | | location.csv | 439 | | location-lookup.csv | 270 | | demographics.csv | 140 |   **Note**: Having to change the bootstrap data filename is considered a failure of this test case. | Pass |
| **1** | **Login** Validate that a student with incorrect credentials cannot log in | **Username:**  ace.2016  **Password:** qwerty278 | 1. Enter the EXACT username and password. 2. Press submit | | 1. “Username/password incorrect” (or a similar message) should be displayed. | Pass |
| **2** | **Login**  Validate that a student can login with his email id, not his email address | **Username:**  ace.2016@sis.smu.edu.sg  **Password:** abcd1234 | 1. Enter the username and password. 2. Press submit. | | 1. “Username/password incorrect” (or a similar message) should be displayed. | Pass |
| **3** | **Login**  Validate that a student with correct credentials can log in | **Username:**  ace.2016  **Password:** abcd1234 | 1. Enter the username and password. 2. Press submit. | | 1. Login must be successful. 2. The home page should be displayed. 3. Note the URL of the basic location reports URL. 4. Make sure that the basic location reports URL cannot be accessed when the user is not logged in (note: there should be a way to logout a current user or at least a way to login a new user) 5. Login as ace.2016 after doing test 4. | Pass |
| **4** | **Heatmap** Validate that the heatmap is generated correctly. | **Date/time:**  2017-3-31 3:15pm  **Level:** L2 | | 1. Enter the date/time and level. 2. Press submit. | The heatmap should be displayed with the following info:   |  |  | | --- | --- | | SMUSISL2LiftLobby(New) | 0 | | SMUSISL2SR2.1(New) | 1 | | SMUSISL2SR2.2(New) | 2 | | SMUSISL2SR2.3(New) | 3 | | SMUSISL2SR2.4(New) | 4 | | SMUSISL2StudyArea1(New) | 5 | | SMUSISL2StudyArea2(New) | 6 |   (Note: If graphical interface is used, check if the density levels are identifiable and displayed correctly on the map. This applies to testcase 5 and 6 as well.) | Pass (Table)  Fail (Graphical) – no overlay at all |

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| **5** | **Heatmap**  \* This case tests when a user reports > 1 update within the window.  \* This test involves very few location updates – if this is slow, other queries are likely to be slow. | **Date/time:**  2017-3-31 3:30pm  **Level:** L2 | 1. Enter the date/time and level. 2. Press submit. | | The heatmap should be displayed with the following info:   |  |  | | --- | --- | | SMUSISL2LiftLobby(New) | 0 | | SMUSISL2SR2.1(New) | 0 | | SMUSISL2SR2.2(New) | 0 | | SMUSISL2SR2.3(New) | 0 | | SMUSISL2SR2.4(New) | 0 | | SMUSISL2StudyArea1(New) | 0 | | SMUSISL2StudyArea2(New) | 1 | | Pass (Table)  Fail (Graphical) – no overlay at all |
| **6** | **Heatmap**  \* This case checks location updates on boundary time. | **Date/time:**  2017-3-31 3:45pm  **Level:** L3 | 1. Enter the date/time and level. 2. Press submit. | | The heatmap should be displayed with the following info.   |  |  | | --- | --- | | SMUSISL3CLSRM(New) | 0 | | SMUSISL3LiftLobby(New) | 1 | | SMUSISL3SR3.1(New) | 0 | | SMUSISL3SR3.2(New) | 0 | | SMUSISL3SR3.3(New) | 0 | | SMUSISL3SR3.4(New) | 0 | | SMUSISL3StudyArea1(New) | 0 | | SMUSISL3StudyArea2(New) | 0 | | SMUSISL3StudyArea3(New) | 0 | | Pass (Table)  Fail (Graphical) – SR 3-1, 3-2, 3-3 appears |
| ***7*** | **Breakdown by year/gender**  Validate that the breakdown report is generated correctly.  \* test single filtering condition. | **Date/time:**  2017-3-31 4:15pm  **Filtering condition:** First: Year  Second: N/A  Third: N/A | 1. Enter the date/time and filtering condition. 2. Press submit. | | The breakdown report should be displayed with the following info.  2016: 76 people, 76%  2015: 24 people, 24%  Other years (2013, 2014, 2017) must be shown and set to 0 people and 0%.  (Note: the results must include percentage. For the web UI, we will accept percentage numbers with up to 2 decimal points if the value is correct – for instance, for the year of 2016, 76%, 76.0%, 76.00% are considered correct. The percentage should be the whole numbers in JSON output. This applies to test case 8 and 9 as well.) | Pass |
| **8** | **Breakdown by year/gender**  \*Test multiple filtering conditions. | **Date/time:**  2017-3-31 4:15pm  **Filtering condition:** First: Year  Second: School  Third: Gender | 1. Enter the date/time and filtering condition. 2. Press submit. | | The breakdown report should be displayed with the following info.  Other years (2013, 2014, 2017) must be shown and set to 0 people and 0%. Other entries in 2015 must also be 0. | Pass |
| **9** | **Breakdown by year/gender**  \* Test with some mac-addresses without matching demographic info. | **Date/time:**  2017-3-31 4:30pm  **Filtering condition:** First: Year  Second: N/A  Third: N/A | 1. Enter the date/time and filtering condition. 2. Press submit. | | The breakdown report should be displayed with the following info.  2015: 1 person, 50%  2016: 1 person, 50%  Other years (2013, 2014, 2017) must be shown and set to 0 people and 0%. | Pass |
| **10** | **Top-k popular place** Validate that the top-k popular place is generated correctly. | **Date/time:**  2017-3-31 3:15pm  **K**:2 | 1. Enter the date/time and k. 2. Press submit. | | The top-k places should be displayed as follows.  Rank 1: SMUSISL2StudyArea2(New), 31 persons  Rank 2: SMUSISL2StudyArea1(New), 21 persons  Check that students include the number of people at the location | Pass |
| **11** | **Top-k popular place** Validate that the top-k popular places are calculated correctly.  \* Test handling the ties at a rank | **Date/time:**  2017-3-31 4:45pm  **K:** 2 | 1. Enter the date/time and k. 2. Press submit. | | The top-k places should be displayed as follows.  Rank 1: SMUSISL2SR2.1(New), 10 persons  SMUSISL2SR2.2(New)  Rank 2: SMUSISL2SR2.3(New), 9 persons  SMUSISL2SR2.4(New) | Pass (but does not show when the ranks are the same using color code) |
| **12** | **Top-k popular place**  \* Test with users with more than two updates within the window. | **Date/time:**  2017-3-31 5:00pm  **K:** 3 | 1. Enter the date/time and k. 2. Press submit. | | The top-k places should be displayed as follows.  Rank 1: SMUSISL2SR2.1(New), 10 persons  Rank 2: SMUSISL2SR2.2(New), 9 persons  Rank 3: SMUSISL2SR2.3(New), 8 persons  SMUSISL2SR2.4(New) | Pass (but does not show when the ranks are the same using color code) |
| **13** | **Top-k companion** Validate that the top-k companions are calculated correctly.  \* Test a basic case – the queried user is stationary. | **Date/time:**  2017-4-1 12:15pm  **MAC address:**  a123456789012345678901234567890123456789  **K:** 3 | 1. Enter the date/time, MAC address, and k. 2. Press submit | | The top-k companions should be displayed as follows.  **Rank 1:**  - Email: [bartholomew.WONG.2016@sis.smu.edu.sg](mailto:bartholomew.WONG.2016@sis.smu.edu.sg),  - Mac address:  1ff866e71e9fd6d2ab3ce99c44e1be725e79dcf1  -Time spent together: 300 sec  **Rank 2:**  - Email : [basanti.WONG.2016@sis.smu.edu.sg](mailto:basanti.WONG.2016@sis.smu.edu.sg)  - Mac address:  6f005f7b2f56616c0faa1d819c42ced7437664f7  -Time spent together: 240 sec  **Rank 3:**  - Email: [basil.WONG.2016@sis.smu.edu.sg](mailto:basil.WONG.2016@sis.smu.edu.sg)  - Mac address:  88dec4dc8140c033d97eed866ba932c5ac7accfa  - Time spent together: 180 sec  \* For both the Web an JSON UIs, ‘time spent together’ should also be reported in seconds | Pass |
| **14** | **Top-k companion**  \* Check the case where the queried user is moving, and some companions are moving along. | **Date/time:**  2017-4-1  1:15pm  **MAC address:**  a123456789012345678901234567890123456789  **K:** 2 | 1. Enter the date/time, MAC address, and k. 2. Press submit | | The top-k companions should be displayed as follows.  **Rank 1:**  - Email : [basanti.WONG.2016@sis.smu.edu.sg](mailto:basanti.WONG.2016@sis.smu.edu.sg)  - Mac address:  6f005f7b2f56616c0faa1d819c42ced7437664f7  - Time spent together: 360 sec.  (Note: overlap 4 mins in 1010200074 and 2 mins in 1010200116)  **Rank 2:**  - Email: [bartholomew.WONG.2016@sis.smu.edu.sg](mailto:bartholomew.WONG.2016@sis.smu.edu.sg),  -Mac address:  1ff866e71e9fd6d2ab3ce99c44e1be725e79dcf1  -Time spent together: 300 sec.  (Note: overlap 5 mins in 1010200074) | Pass |
|  | |
| **15** | **Top-k next place**  Validate that the top-k next places are calculated correctly. | **Date/time:**  2017-4-1  3:30pm  **Origin place**:  SMUSISL2SR2.1(New)  **K**: 3 | 1. Enter the date/time, origin place, and k. 2. Press submit | | The top-k next places should be displayed as follows (location ID not required).  Rank 1: SMUSISL3SR3.1(New), 5, 50%  Rank 2: SMUSISL3SR3.2(New), 3, 30%  Rank 3: SMUSISL3SR3.3(New), 2, 20%  Number of people at the origin: 10  Number of people who visited other places: 10 | Pass |
| **16** | **Top-k next place**  \* Test if 5-minute visit is handled properly | **Date/time:**  2017-4-1  4:00pm  **Origin place**:  SMUSISL2SR2.1(New)  **K**: 3 | 1. Enter the date/time, origin place, and k. 2. Press submit | | The top-k next places should be displayed as follows.  Rank 1: SMUSISL3SR3.1(New), 8, 80%,  Rank 2: SMUSISL3SR3.2(New), 1, 10%  \* Rank 3 shouldn’t be returned.  Number of people at the origin: 10  Number of people who visited other places: 9  (note: 1 repeated entry (Bernadette) and 1 (Berenice) did not stay in 3.1 long enough) | Pass |
| **17** | **Top-k next place**  \* Check the self-transition to the same location  \* Test with a user who make multiple location transitions with non-eligible last update. | **Date/time:**  2017-4-1  6:00pm  **Origin place**:  SMUSISL5LiftLobby(New)  **K**: 1 | 1. Enter the date/time, origin place, and k. 2. Press submit | | The top-k next place should be displayed as follows.  Rank 1: SMUSISL5LiftLobby(New), 1, 100%,  Total number of users at the origin: 1  People who visited another place: 1  (Note: Last update to 2.1 is not long enough) | Pass |
| **18** | **Group detection**  Validate that the groups are detected correctly.  \* Test with 2-people groups at one location | **Date/time:**  2017-10-27  12:15pm | 1. Enter the date/time. 2. Press submit. | | Groups should be reported as follows.  **Group 1:**  - Mac-addresses/emails of members:  aaaa….aaaaaaaaaaaaaaaaaa (40 digit),  [abs.2016@sis.smu.edu.sg](mailto:abs.2014@sis.smu.edu.sg)  bbbb… bbbbbbbbbbbbbbbbb (40 digit)  [busy.2016@sis.smu.edu.sg](mailto:busy.2014@sis.smu.edu.sg)  - Location visited together:  1010200116 (600 sec.),  1010200099 (120 sec.)  Number of users in SIS building: 4  Number of groups: 1 (check that this is included. some teams missed it)  **No other groups are found. Below explains why** **‘corn’ and ‘debt’ are not in a group. They are only together for 11 minutes and all other pairs are lower than that.**  - Mac-addresses/emails of members:  cccc….ccccccccccccccccccccc (40 digit)  [corn.2016@sis.smu.edu.sg](mailto:corn.2014@sis.smu.edu.sg)  dddd…dddddddddddddddddd (40 digit)  [debt.2016@sis.smu.edu.sg](mailto:debt.2014@sis.smu.edu.sg)  - Locations visited together:  1010200116 (600 sec.)  1010200080 (60 sec.) | Pass |
| **19** | **Group detection**  \* Test a wiki example, i.e., with n-people group moving together  \* Test a time that the processing window span over two different days | **Date/time:**  2017-10-28  12:04am | 1. Enter the date/time. 2. Press submit. | | Groups should be reported as follows.  **Group 1:**  - Mac-addresses/emails of members:  aaaa….aaaaaaaaaaaaaaaaaa (40 digit)  [abs.2016@sis.smu.edu.sg](mailto:abs.2014@sis.smu.edu.sg)  bbbb… bbbbbbbbbbbbbbbbb (40 digit)  [busy.2016@sis.smu.edu.sg](mailto:busy.2014@sis.smu.edu.sg)  cccc…. ccccccccccccccccccccc (40 digit)  [corn.2016@sis.smu.edu.sg](mailto:corn.2014@sis.smu.edu.sg)  - Locations visited together:  1010200116 (720 sec.)  (Note: aa.. & bb… are together for 14 mins)  **Group 2:**  - Mac-addresses/emails of members:  aaaa….aaaaaaaaaaaaaaaaaa (40 digit)  [abs.2016@sis.smu.edu.sg](mailto:abs.2014@sis.smu.edu.sg)  bbbb… bbbbbbbbbbbbbbbbb (40 digit)  [busy.2016@sis.smu.edu.sg](mailto:busy.2014@sis.smu.edu.sg)  dddd…dddddddddddddddddd (40 digit)  [debt.2016@sis.smu.edu.sg](mailto:debt.2014@sis.smu.edu.sg)  - Locations visited together:  1010200116 (720 sec.)  Number of users in SIS building: 4  Number of groups: 2  (check that this is included. some teams missed it) | Pass |
| **20** | **Group detection**  \* Test n-people group where members leave and join  \* Test the exact time for the last record – inclusive property  \* Test if the groups are detected using location ids, not semantic places. | **Date/time:**  2017-10-29  12:14:59pm | 1. Enter the date/time. 2. Press submit. | | Groups should be reported as follows.  **Group 1:**  - Mac-addresses/emails of members:  aaaa….aaaaaaaaaaaaaaaaaa (40 digit)  [abs.2016@sis.smu.edu.sg](mailto:abs.2014@sis.smu.edu.sg)  cccc…. ccccccccccccccccccccc (40 digit)  [corn.2016@sis.smu.edu.sg](mailto:corn.2014@sis.smu.edu.sg)  - Locations visited together:  1010200116 (601 sec.),  1010300149 (119 sec.)  Number of users in SIS building: 4  Number of groups: 1  **No other groups are found. Below explains why ‘busy’ and ‘debt’ is not in a group.**  - Mac-addresses/emails of members:  bbbb… bbbbbbbbbbbbbbbbb (40 digit)  [busy.2016@sis.smu.edu.sg](mailto:busy.2014@sis.smu.edu.sg)  dddd…dddddddddddddddddd (40 digit)  [debt.2016@sis.smu.edu.sg](mailto:debt.2014@sis.smu.edu.sg)  - Locations visited together:  1010200116 (600 sec.),  1010300148 (60 + 59 sec.)  So short by 1s from forming a group | Pass |
| **21** | **Group detection**  \* Test a complicated case with multiple corner cases occur together. | **Date/time:**  2017-10-30  12:14:59pm | 1. Enter the date/time. 2. Press submit. | | Groups should be reported as follows.  **Group 1:**  - Mac-addresses/emails of members:  aaaa….aaaaaaaaaaaaaaaaaa (40 digit)  [abs.2016@sis.smu.edu.sg](mailto:abs.2014@sis.smu.edu.sg)  bbbb… bbbbbbbbbbbbbbbbb (40 digit)  [busy.2016@sis.smu.edu.sg](mailto:busy.2014@sis.smu.edu.sg)  dddd…dddddddddddddddddd (40 digit)  [debt.2016@sis.smu.edu.sg](mailto:debt.2014@sis.smu.edu.sg)  - Locations visited together:  1010200116 (720 sec.)  **Group 2:**  - Mac-addresses/emails of members:  aaaa….aaaaaaaaaaaaaaaaaa (40 digit)  [abs.2016@sis.smu.edu.sg](mailto:abs.2014@sis.smu.edu.sg)  bbbb… bbbbbbbbbbbbbbbbb (40 digit)  [busy.2016@sis.smu.edu.sg](mailto:busy.2014@sis.smu.edu.sg)  eeee…eeeeeeeeeeeeeeeeee (40 digit)  [elf.2016@sis.smu.edu.sg](mailto:elf.2014@sis.smu.edu.sg)  - Locations visited together:  1010200116 (660 sec.),  1010300138 (60 sec.)  **Group 3:**  - Mac-addresses/emails of members:  dddd… ddddddddddddddddd (40 digit)  [debt.2016@sis.smu.edu.sg](mailto:debt.2014@sis.smu.edu.sg)  eeee…eeeeeeeeeeeeeeeeee (40 digit)  [elf.2016@sis.smu.edu.sg](mailto:elf.2014@sis.smu.edu.sg)  - Locations visited together:  1010200116 (660 sec.),  1010300149 (60 sec.)  Number of users in SIS building: 5  Number of groups: 3  **Note: ‘busy’ and ‘corn’ only spend 11 mins 59s together. 11 mins in 111, and 59s in 136** | Pass |
| **22** | **Upload additional files**  Test if adding a new file works | **uat-data2.zip**  **Admin credential (provided by team)** | 1. Login to the admin interface 2. Use the upload additional data option to load uat-data2.zip   **Note**: Having to change the bootstrap data filename is considered a failure of this test case. | A message that the data is uploaded correctly (there should be no error messages printed).   |  |  | | --- | --- | | File | # of Records Loaded | | location.csv | 20 | | demographics.csv | 4 |   **Note**: Having to change the additional data filename is considered a failure of this test case.  Test that the new data went in by trying to login as  Username: test3.new.2014  Password: 10011001  And do a heatmap lookup for  2014-10-11 12.40 p.m. (Oct 11 2014), SIS Level 5. The crowd density is 2 SMUSISL5AcadOffice(New)**.** | | Pass |
| **23** | **Bootstrap validation**  Validate that the system checks for invalid data entries | **uat-data3.zip**  **Admin id/pwd:** <Provided by team> | 1. Login as admin. 2. Bootstrap uat-data3.zip.   **NOTES For This Test:**   1. The admin output must be human readable and not in JSON format as stated in the project writeup. If it is JSON, this test fails.   From the wiki page  “The admin page needs not be pretty but it has to be user friendly (simple design will do) without the need for users to know JSON request nor read JSON response.”   1. The errors should be displayed (with proper error messages):   **Note**: The ordering of the errors is not crucial except that it must be clear which file the error being reported is for. To make things easier, please sort and combine your errors by name of the CSV file (as shown below).  **However**, it must be clear which record in which file has the errors reported. The best reports will state the file, line number, and the specific error. If it is not clear which specific file or record corresponds to the error, this test fails.  **Note**: Having to change the bootstrap data filename is considered a failure of this test case. | |  |  | | --- | --- | | File | # of Records Loaded | | location.csv | 2 | | location-lookup.csv | 541 | | demographics.csv | 1 |   The errors are:  demographics.csv (4 errors) Line 2: Invalid mac address (char g inside) Line 3: invalid password (7 chars) Line 4: invalid password (whitespace),  invalid gender (S)  Line 5: invalid mac address(39 char)  Location.csv (17 errors) Line 2: invalid location(not found in location lookup) Line 3: invalid timestamp (2016-3-31 15:04:00) Line 4: duplicate row, Line 5: duplicate row Line 6: duplicate row Line 7: duplicate row Line 8: duplicate row Line 9: duplicate row Line 10: duplicate row Line 11: duplicate row Line 12: duplicate row Line 13: duplicate row Line 14: duplicate row Line 15: duplicate row Line 16: duplicate row Line 17: duplicate row Line 20: invalid location  location-lookup (4 errors) Line 3: invalid location id (negative location) Line 4: invalid location id, invalid semantic place   (negative location, NTU) Line 5: invalid semantic place  (should be L/B instead of C) Line 6: invalid location id (having comma) | | Fail  Loc Lookup Line 6 gives error “[rows contain less than or more than 2 fields]” |