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| STAGE 1 – STEP A |

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| --- | --- | --- |
| QUERY | PROCESS TIME | INFORMATION |
| 1 | 3.631951 seconds | 37 users |
| 2 | 6.127432 seconds | 1519 users |
| 3 | 4.429980 seconds | 28 users |
| 4 | 2.182598 seconds | ID: 001997 |

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| STAGE 2 – STEP A |
| Process time for stage a is 47.854652 seconds |

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| STAGE 2 – STEP B |
| Process time for sorting all tables is 5.381380 seconds |

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| --- | --- | --- |
| TABLE | COLUMN SORTED | REASON WHY |
| Record | Name(sorted it alphabetically) | This was the only column that was not sorted a certain way and it would be easy to query the table or find a user if their names where sorted alphabetically. |
| Location | City(sorted it alphabetically) | We can find the users that message in the same cities and states if they are sorted alphabetically. |

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| STAGE 2 – STEP C |

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| --- | --- | --- |
| QUERY | PROCESS TIME | INFORMATION |
| 1 | 1.186604 | 37 users |
| 2 | 45.599331 | 1519 users |
| 3 | 50.652843 | 28 users |
| 4 | 45.740452 | ID: 001997 |

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| COMPARISON OF TIMING RESULT OF STAGE 1 AND STAGE 2 |

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| --- | --- | --- | --- | --- |
| QUERY | TIMING RESULT STAGE 1(secs) | TIMING RESULT STAGE 2(secs) | DISCOVERY | EXPLANATION |
| 1 | 3.631951 | 1.186604 | The timing result in stage 2 is less than the timing result in stage 1 | This is probably because in stage 2 we are only querying the location files which has less data than stage 1 where we are querying the record files |
| 2 | 6.127432 | 45.599331 | The timing result in stage 2 is more than the timing result in stage 1 | This is probably because in stage 2, we are querying through the record and location files which is twice the number of files we are querying through in stage 1 |
| 3 | 4.429980 | 50.652843 | The timing result in stage 2 is more than the timing result in stage 1 | This is probably because in stage 2, we are querying through the record and location files which is twice the number of files we are querying through in stage 1 |
| 4 | 2.182598 | 45.740452 | The timing result in stage 2 is more than the timing result in stage 1 | This is probably because in stage 2, we are querying through the record and location files which is twice the number of files we are querying through in stage 1 |

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| COMPARISON OF ALGORITHM COMPLEXITIES AND TIMING RESULT OF EACH QUERY |

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| --- | --- | --- |
| QUERY | ALGORITHM COMPLEXITIES | PROCESS TIME |
| 1 | O(1) | 1.186604 |
| 2 | O(n) | 45.599331 |
| 3 | O(n+2) | 50.652843 |
| 4 | O(n+2) | 45.740452 |

DISCOVERY

Query 1 has the smallest process time, Query 3 has the largest process time while Query 4 and 2 share approximately the same process time.

EXPLANANTION

Query 1 probably has the smallest process time because it only goes through an if statement. Query 3 has the largest because it goes through a for loop and 2 if statements.