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| Update 1  (Initialization at 9am) | Leader sheep id (10000) | Leader sheep location (“17.911847, 36.436322”) | Cluster sheep  (10001, 10002, 10003, 10004, 10005) | Initialize variables:  0.01change in latitude/longitude results in 1km displacement. |
| Leader sheep id (20000) | Leader sheep location (“10.015827, 10.386621”) | Cluster sheep  (20001, 20002, 20003, 20004, 20005) |
| Leader sheep id (30000) | Leader sheep location (“22.063343, 38.435378”) | Cluster sheep  (30001, 30002) |
| Update 2  (9:10 am)  (case 1, no missing sheep, just sheep walking to other clusters) | Leader sheep id (10000) | Leader sheep location (“17.800000, 36.300000”) | Cluster sheep  (10001, 20001, 10002, 10003, 10005) | For each id in update 1 sheep 10000 cluster, see if it is in update 2 sheep 10000 cluster. Notice 10004 is NOT in. Try to find 10004 in update 2 sheep 20000 cluster, in update 2 sheep 30000 cluster. Okay, found 10004 in sheep 30000 cluster. Not missing |
| Leader sheep id (20000) | Leader sheep location (“10.100000, 10.300003”) | Cluster sheep  (20001, 20002, 20003, 20004, 20005) | Repeat the same, no missing |
| Leader sheep id (30000) | Leader sheep location (“22.060000, 38.400000”) | Cluster sheep  (30001, 30002, 10004) | Repeat the same, no missing |
| Update 3  (9:20 am)  (case 2, missing follower sheep) | Leader sheep id (10000) | Leader sheep location (“17.800005, 36.300005”) | Cluster sheep  (10001, 20001, 10002, 10003, 10005) | Repeat the same, but this time compare sheep ids in the cluster using update 2 and 3. |
| Leader sheep id (20000) | Leader sheep location (“10.100005, 10.300005”) | Cluster sheep  (20001, 20002, 20003, 20004, 20005) | Repeat the same, but this time compare sheep ids in the cluster using update 2 and 3. |
| Leader sheep id (30000) | Leader sheep location (“22.060005, 38.400005”) | Cluster sheep  (30001, 30002) | Repeat the same but did not find 10004 in all the other clusters.  **REPORT MISSING id 10004, location, (“22.060005, 38.400005”)**  **We assume this missing sheep comes back later.** |
| Update 4  (9:30 am)  (case 3, a missing leader sheep | Leader sheep id (10000) | Leader sheep location (“17.800005, 36.300002”) | Cluster sheep  (10001, 20001, 10002, 10003, 10005, 10004) | Repeat the same, no missing |
| Leader sheep id (20000) | Leader sheep location (“10.100003, 10.300005”) | Cluster sheep  (20001, 20002, 20003, 20004, 20005, 30001, 30002) | Repeat the same, no missing |
| Leader sheep id (30000) | Leader sheep location (“22.060008, 38.400005”) | Cluster sheep | if the cluster == NULL, report a missing leader sheep.  **REPORT MISSING id 30000, location, (“22.060008, 38.400005”)** |
| Update 4  (9:40 am)  (case 4, missing a whole cluster of sheep | Leader sheep id (10000) | Leader sheep location (“17.800025, 36.300003”) | Cluster sheep  (10001, 20001, 10005, 10004) | Repeat the same, no missing |
| Leader sheep id (20000) | Leader sheep location (“10.100003, 10.300015”) | Cluster sheep  (20001, 20002, 20004, 20005, 30001, 30002) | Repeat the same, no missing |
| Leader sheep id (30000) | Leader sheep location (“22.160008, 38.300003”) (this location is exaggerated, may need to test) | Cluster sheep  (20003, 10002, 10003) | if the gps location is farther than the range.  **REPORT MISSING id 30000, 20003, 10002, 10003, location, (“22.160008, 38.300003”)** |

(research needed, for the missing a whole cluster of sheep case, we need to set a grazing range. Once the GPS location goes beyond this range, then this whole cluster of sheep is missing. But I assume this case is rare since the communal grazing area is kinda bounded by the sheds/water dam seen from the picture.)

TODO 1:

1. Case of missing multiple sheep
2. Case of missing a follower sheep from an already missed sheep cluster
3. Case of … anyone can think of more edge cases?

TODO 2:

1. Check with Ethan how precise the GPS decimals are
2. Check with Ethan how to send sheep ids using the wireless transceiver, how to store the ids using RAM?