|  |  |  |
| --- | --- | --- |
| Number of Workers | Package Planned | Actually delivered |
| 1 | 2000 | 2000 |
| 2 | 2000 | 3028 |
| 3 | 2000 | 3835 |
| 4 | 2000 | 3423 |
| 5 | 2000 | 3182 |
| 6 | 2000 | 3481 |

Second Phase(lower value):

|  |  |  |
| --- | --- | --- |
| Number of Workers | Package Planned | Actually delivered |
| 1 | 500 | 500 |
| 2 | 500 | 764 |
| 3 | 500 | 942 |
| 4 | 500 | 780 |
| 5 | 500 | 843 |
| 6 | 500 | 871 |

***My first observation is the problem:***

AFTER SEVERAL CHECK , I found there is no problem with the NUMBER OF PACKAGES , there is a problem with NUMBER OF WORKERS

My first observation is the problem acquires when the number of workers greater than 1 (when there is one worker the packages are correctly delivered)

***What are all may be the reason:***

1. reason may be they are delivering the same package by 2 or more workers ---> need to fix it (count increment is happening even if the package already delivered is detected)
2. The logger didn't maintain the package delivered information correctly
3. Even after delivered the package, package delivered status didn't update.
4. Same package assigned to 2 or more workers (need to check already assigned or not while assigning packages) ((((CORRECT))))
5. Threading is used here, so there is a chance for "race condition".

***SOLUTION:***

After checking all the possibility, The 4th reason is correct. While assigning the packages to the worker, they are checking only if the package is delivered or not. But actually sometimes the package is already assigned to someone and the worker was busy with delivering the package. So the status delivered was not changed, as a result the same package assigned to another worker again. This is the actual problem acquiring here.

So simply check, weather the package is already assigned to someone or not. If yes, move to the next package . If no, then assign that package to the coming worker.

Now the package problem is fixed

|  |  |  |
| --- | --- | --- |
| Package planned | Actually delivered | Time taken (sec) |
| 20 | 20 | 1 |
| 50 | 50 | 2 |
| 500 | 500 | 4 |
| 3000 | 3000 | 10 |
| 10,000 | 10,000 | 38 |

Now it is taking 13 sec to deliver 5000 packages . So, optimization is required.