**LOAD CALCULATION OF SERVICE STATIONS ON APPLYING A FILTRATION PROCESS USIN EDGE COMPUTING: -**

**Problems solved by fellow cars on applying edge computing: -**

Let,

**N** = no. of cars in trouble in a radius of **r** kms. at a time instant **T.**

**f =** total no. of fellow car present at a time instant **T.**

**p1 =** percentage of fellow car who can provide assistance to some or all of the **N** cars in trouble.

So, the no. of problems solved by fellow cars =

**Problems solved by service cars on applying edge computing: -**

Again,

**s** = no. of service cars presents at time instant **T**.

**r** = maximum radius allowed for each car in trouble.

**p2** = percentage of service vehicles who can provide assistance to some or all of the **N** cars in trouble.

So, no. of problems solved by service cars =

**Problem solved by service stations on applying edge computing: -**

Now, rest of the problems will be solved by service stations.

No. of problems solved by service stations =

Now,

Average value of p1 =

Average value of p2 =

Average value of f =

Average value of s =

**Problem solved by service stations without applying edge computing: -**

No. of problem solved by the service station = *N*

If filtering is done then the no. of cars serviced less by service stations is =

=

Hence, it can be said that the service stations are doing service of a smaller number of cars after filtration process.

**FUEL CONSUMPTION: -**

Fuel consumption is directly proportional to the distance travelled. That means the more distance travelled means more fuel consumed.

**Fuel consumption on applying edge computing.**

Let,

**N** = no. of cars in trouble at time **T.**

**f** = no. of fellow cars presents at time instant **T**.

**r** = maximum radius allowed for each car in trouble.

**p1** = percentage of fellow vehicles who can provide assistance to some or all of the N cars in trouble.

Now, we note that the fellow cars which will provide assistance will actually travel no extra distance because fellow cars accept requests only if they find that the assistance has to be provided in to a vehicle which is on their desired route they are travelling in.

So, distance travelled by fellow cars to provide assistance **=**

Again,

**s** = no. of service cars presents at time instant **T**.

**r** = maximum radius allowed for each car in trouble.

**p2** = percentage of service vehicles who can provide assistance to some or all of the N cars in trouble.

**davg =** average up-down distance from service car to car in trouble. Note that **davg<=r.**

So, distance travelled by service cars to provide assistance **=**

Finally, after all the filtering is done rest of the cars in trouble will be sent to the service station. They are either towed or reaches there on it’s own. Hence,

**Davg =** average up-down distance from service station to car in trouble.

So, distance travelled to reach service station **=**

Hence, Total distance **dedge = d1 + d2 + d3 =**

**Fuel consumption on not applying edge computing.**

Let,

**N** = no. of cars in trouble at time **T.**

**Davg =** average up-down distance from service station to car in trouble.

Since none of the filtering is done the cars are directly taken to the service stations. Hence total distance travelled **= dnon-edge =**

**Improvement in fuel consumption**

Distance improved by

**dimproved = dnon-edge – dedge**

**=**

**=**