

The background of this report

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1 Some fundamental items

We provide the Simple characters and their meanings represented in matlab code as follows:

Age of Information : aoi

threshold: I

Service time: D

The deterministic time before threshold : $W1 = I - D$

The remaining time left in W state : $W2 = W - W1$, in matlab code, we apply its expected value $\frac{1}{\lambda}$.

State : s .

eg. ($s = 1$) : W

($s = 2$) : $Busy(D)$

Residual time left in $W1$ and D : $rt1$ and $rt2$.

2 Main code

Algorithm 1: AoI

Input: initial state $s = 1$; $rt1 = W1$; $rt2 = D$

Output: output AoI

```
1 if  $s == 1$  then
2   cnt1 ++;
3   if  $a \leq rt1$  then
4      $rt1 = rt1 - a$ ;
5     state stays in W;
6   end
7   if  $a > rt1$  then
8     state switches to B
9   end
10 end
11 if  $s == 2$  then
12   cnt2++;
13   if  $a \leq rt2$  then
14     state stays at B;
15      $rt2 = rt2 - a$ ;
16   end
17   if  $rt2 < a \leq W1 + rt2$  then
18     stays at W
19   end
20   end
21   if  $a > W1 + rt2$  then
22     state shifts to B
23   end
24   Calculate AoI
```
