PA2 REPORT

Rajesh Reddy Mekala 50415674 Sai Kumar Madhadi 50419505 Srinand Andey 50416798

I have read and understood the course's academic integrity policy.

Alternating-Bit-Protocol (ABT)

Sanity test screenshots

```
highgate {/local/Fall_2021/smadhadi/cse489589_assignment2/grader} > ./sanity_tests -p ../smadhadi/abt -r ./run_experiments
                                         LOSS:0.1, CORRUPTION:0.0, ARRIVAL:50, WINDOW:0
Running simulator [10 Runs] ...
                                 Done!
                                  Done!
                                  Done!
PASS!
Testing with MESSAGES:1000, LOSS:0.2, CORRUPTION:0.0, ARRIVAL:50, WINDOW:0 ...
Running simulator [10 Runs] ...
 unning simulator [10 F

un#1 [seed=1234] ...

un#2 [seed=1111] ...

un#3 [seed=2222] ...

un#4 [seed=3333] ...

un#5 [seed=4444] ...

un#6 [seed=5555] ...

un#7 [seed=6666] ...

un#8 [seed=7777] ...

un#9 [seed=8888] ...
                                  Done!
                                  Done!
                                  Done!
 esting with MESSAGES:1000, LOSS:0.4, CORRUPTION:0.0, ARRIVAL:50, WINDOW:0 ...
Running simulator [10 Runs] ...
                                  Done!
                                  Done!
                                   Done!
```

```
:1000, LOSS:0.6, CORRUPTION:0.0, ARRIVAL:50, WINDOW:0 ...
Running simulator [10 Runs] ...
  Running simulator [10 F
Runn#1 [seed=1234] ...
Runn#3 [seed=2222] ...
Runn#4 [seed=23333] ...
Runn#5 [seed=4444] ...
Runn#6 [seed=5555] ...
Runn#7 [seed=6666] ...
Runn#8 [seed=7777] ...
Runn#8 [seed=8888] ...
Runn#10 [seed=9999] ...
PASS!
                                                              Done!
  PASS!
Testing with MESSAGES:1000, LOSS:0.8, CORRUPTION:0.0, ARRIVAL:50, WINDOW:0 ... Running simulator [10 Runs] ...
  Running simulator [10 Runs] ...
Runn#1 [seed=1234] ... Done!
Runn#3 [seed=2222] ... Done!
Runn#4 [seed=3333] ... Done!
Runn#5 [seed=4444] ... Done!
Runn#6 [seed=5555] ... Done!
Runn#7 [seed=6666] ... Done!
Runn#8 [seed=7777] ... Done!
Runn#8 [seed=8888] ... Done!
Runn#10 [seed=9999] ... Done!
PASS!
 PASS!
Testing with MESSAGES:1000, LOSS:0.0, CORRUPTION:0.1, ARRIVAL:50, WINDOW:0 ... Running simulator [10 Runs] ...
  Run#1 [seed=1234]
Run#2 [seed=1111]
Run#3 [seed=2222]
Run#4 [seed=3333]
Run#5 [seed=4444]
Run#6 [seed=5555]
                                                              Done!
                                                              Done!
   Run#8 [seed=7777]
Run#9 [seed=8888]
                                                              Done!
                                                              Done!
   tun#10 [seed=9999] ...
                                                              Done!
```

```
LOSS:0.0, CORRUPTION:0.2, ARRIVAL:50, WINDOW:0
Running simulator [10 Runs] ...
 tun#1 [seed=1234]
tun#2 [seed=1111]
                                    Done!
                                     Done!
         [seed=2222]
[seed=3333]
                                    Done!
                                    Done!
 tun#5 [seed=4444]
tun#6 [seed=5555]
tun#7 [seed=6666]
                                    Done!
                                    Done!
                                    Done!
 tun#8 [seed=7777]
tun#9 [seed=8888]
                                    Done!
                                    Done!
                                    Done!
PASS!
Testing with MESSAGES:1000, LOSS:0.0, CORRUPTION:0.4, ARRIVAL:50, WINDOW:0 ...
Running simulator [10 Runs] ...
 tun#1 [seed=1234]
tun#2 [seed=1111]
                                   Done!
                                    Done!
 Run#3 [seed=2222]
Run#4 [seed=3333]
                                    Done!
                                    Done!
 Run#5 [seed=3333]
Run#5 [seed=4444]
Run#6 [seed=5555]
Run#7 [seed=6666]
                                    Done!
                                    Done!
 tun#8 [seed=7777]
tun#9 [seed=8888]
 esting with MESSAGES:1000, LOSS:0.0, CORRUPTION:0.6, ARRIVAL:50, WINDOW:0 ...
Running simulator [10 Runs] ...
 Run#1 [seed=1234]
Run#2 [seed=1111]
Run#3 [seed=2222]
Run#4 [seed=3333]
                                    Done!
         [seed=4444]
[seed=5555]
[seed=6666]
                                    Done!
                                    Done!
 un#8 [seed=7777]
un#9 [seed=8888]
                                    Done!
 un#10 [seed=9999]
```

```
SS:0.0, CORRUPTION:0.0, ARRIVAL:1000, WINDOW:0
Running simulator [10 Runs] ...
                            Done!
                            Done!
                            Done!
                            Done!
 ASS!
esting with MESSAGES:20, LOSS:1.0, CORRUPTION:0.0, ARRIVAL:1000, WINDOW:0 ...
Running simulator [10 Runs] ...
 un#1 [seed=1234]
un#2 [seed=1111]
un#3 [seed=2222]
un#4 [seed=3333]
                             Done!
                            Done!
                            Done!
       [seed=4444]
[seed=5555]
[seed=6666]
                            Done!
                            Done!
                            Done!
 ASS!
esting with MESSAGES:20, LOSS:0.0, CORRUPTION:1.0, ARRIVAL:1000, WINDOW:0 ...
Running simulator [10 Runs] ...
                             Done!
       [seed=1111]
[seed=2222]
[seed=3333]
                            Done!
                            Done!
                            Done!
                            Done!
SANITY TESTS: PASS
```

Basic tests screenshots

```
stones {/local/Fall_2021/rajeshre/cse489589_assignment2/grader} > ./basic_tests -p ../rajeshre/abt -r ./run_experiments
 Running simulator [10 Runs] ...
                          Done!
       [seed=1234]
[seed=1111]
                          Done!
                          Done!
                          Done!
 'ASS:!
Testing with MESSAGES:20, LOSS:0.4, CORRUPTION:0.0, ARRIVAL:1000, WINDOW:0 ...
Running simulator [10 Runs] ...
                    ... Done!
                          Done!
                          Done!
                          Done!
 ASS!
esting with MESSAGES:20, LOSS:0.8, CORRUPTION:0.0, ARRIVAL:1000, WINDOW:0 ...
 Running simulator [10 Runs] ...
                         Done!
                          Done!
                          Done!
                          Done!
```

```
:20, LOSS:0.0, CORRUPTION:0.1, ARRIVAL:1000, WINDOW:0
Running simulator [10 Runs] ...
         [seed=1234]
[seed=1111]
                                Done!
                                 Done!
        [seed=111]
[seed=2222]
[seed=3333]
[seed=4444]
[seed=5555]
[seed=6666]
                                 Done!
 tun#8 [seed=7777]
tun#9 [seed=8888]
                                 Done!
                                 Done!
  un#10 [seed=9999] ... Done!
  esting with MESSAGES:20, LOSS:0.0, CORRUPTION:0.4, ARRIVAL:1000, WINDOW:0 ...
Running simulator [10 Runs] ...
 Run#1 [seed=1234]
Run#2 [seed=1111]
Run#3 [seed=2222]
Run#4 [seed=3333]
Run#5 [seed=4444]
                                 Done!
                                 Done!
                                 Done!
        [seed=5555]
[seed=6666]
                                 Done!
                                 Done!
Testing with MESSAGES:20, LOSS:0.0, CORRUPTION:0.8, ARRIVAL:1000, WINDOW:0 ... Running simulator [10 Runs] ...
 kun#1 [seed=1234]
kun#2 [seed=1111]
                                 Done!
                                 Done!
                                 Done!
        [seed=8888]
                                 Done!
 un#10 [seed=9999] ...
                                  Done!
```

Advanced tests screenshots

```
Stones (/local/Fall 2021/rajeshre/csc489589 assignment2/grader) > ./advanced_tests -p ../rajeshre/abt -r ./run_experiments
Testing with MESSAGES:1000, LOSS:0.1, CORRUPTION:0.0, ARRIVAL:50, WINDOW:0 ...
Runwal [seed=1234] ... Done!
Runwal [seed=1234] ... Done!
Runwal [seed=2222] ... Done!
Runwal [seed=23333] ... Done!
Runwal [seed=4444] ... Done!
Runwal [seed=45555] ... Done!
Runwal [seed=6666] ... Done!
Runwal [seed=6666] ... Done!
Runwal [seed=6999] ... Done!
Runwal [seed=6999] ... Done!
Runwal [seed=6999] ... Done!
Runwal [seed=2333] ... Done!
Runwal [seed=2333] ... Done!
Runwal [seed=234] ... Done!
Runwal [seed=4344] ... Done!
Runwal [seed=4444] ... Done!
Runwal [seed=4444] ... Done!
Runwal [seed=6666] ... Done!
Runwal [seed=9999] ... Done!
Runwal [seed=9999] ... Done!
Runwal [seed=2222] ... Done!
Runwal [seed=2222] ... Done!
Runwal [seed=2222] ... Done!
Runwal [seed=2233] ... Done!
Runwal [seed=2234] ... Done!
Runwal [seed=2333] ... Done!
Runwal [seed=3333] ... Done!
Runwal [seed=3333] ... Done!
Runwal [seed=2333] ... Done!
Runwal [seed=3333] ... Done!
Runwal [seed=333
```

```
LOSS:0.6, CORRUPTION:0.0, ARRIVAL:50, WINDOW:0
Running simulator [10 Runs] ...
           | Sed=1234|
| [seed=1111]
| [seed=2222]
| [seed=3333]
| [seed=4545]
| [seed=5555]
| [seed=6666]
| [seed=8888]
                                              Done
                                              Done!
                                              Done!
                                              Done!
                                              Done!
   in#10 [seed=9999]
PASS:
Testing with MESSAGES:1000, LOSS:0.8, CORRUPTION:0.0, ARRIVAL:50, WINDOW:0 ...
Running simulator [10 Runs] ...
          [seed=1234]
[seed=1111]
[seed=2222]
[seed=33333]
[seed=4443]
[seed=5555]
[seed=6666]
[seed=7777]
[seed=8888]
                                              Done!
                                              Done!
                                              Done!
                                              Done!
                                              Done!
                                              Done!
rass:
Testing with MESSAGES:1000, LOSS:0.0, CORRUPTION:0.1, ARRIVAL:50, WINDOW:0 ...
Running simulator [10 Runs] ...
           [seed=1234]
[seed=1111]
[seed=2222]
[seed=3333]
[seed=4343]
[seed=5555]
[seed=6666]
[seed=7777]
[seed=8888]
                                              Done!
                                              Done!
                                              Done!
```

```
Running simulator [10 Runs]
 Run#1 [seed=1234]
Run#2 [seed=1234]
Run#3 [seed=1111]
Run#4 [seed=3333]
Run#5 [seed=4444]
Run#6 [seed=5555]
Run#7 [seed=6666]
                                                  Done!
                                                  Done
                                                  Done!
                                                  Done!
                                                  Done!
                                                  Done!
Testing with MESSAGES:1000, LOSS:0.0, CORRUPTION:0.4, ARRIVAL:50, WINDOW:0 ...
Running simulator [10 Runs] ...
 Run#1 [seed=1234]
Run#2 [seed=1111]
Run#3 [seed=2222]
Run#4 [seed=3333]
Run#5 [seed=4444]
                                                  Done!
                                                  Done!
                                                  Done!
                                                  Done!
  un#5 [sed=4444] ...
un#6 [seed=5555] ...
un#7 [seed=6666] ...
un#8 [seed=7777] ...
un#9 [seed=8888] ...
un#10 [seed=9999] ...
                                                  Done!
                                                  Done!
                                                  Done!
Testing with MESSAGES:1000, LOSS:0.0, CORRUPTION:0.6, ARRIVAL:50, WINDOW:0 ...
Running simulator [10 Runs] ...
           [seed=1234]
[seed=1111]
[seed=2222]
[seed=3333]
[seed=4444]
[seed=5555]
 tun#2
tun#3
tun#4
tun#5
                                                  Done!
                                                  Done
                                                  Done!
                                                  Done!
                                                  Done!
                                                  Done!
```

```
Testing with MESSAGES:1000, LOSS:0.0, CORRUPTION:0.8, ARRIVAL:50, WINDOW:0 ...

Running simulator [10 Runs] ...

Run#1 [seed=1234] ... Done!

Run#2 [seed=1111] ... Done!

Run#3 [seed=2222] ... Done!

Run#4 [seed=3333] ... Done!

Run#5 [seed=4444] ... Done!

Run#6 [seed=5555] ... Done!

Run#7 [seed=6666] ... Done!

Run#8 [seed=7777] ... Done!

Run#9 [seed=8888] ... Done!

Run#10 [seed=9999] ... Done!

Run#10 [seed=9999] ... Done!
```

Go-Back-N Protocol (GBN)

We used a array of structures to buffer the incoming messages received from layers5 to A. The messages in this buffer are later sent to B according to the windows size.

Sanity tests screenshots

```
highgate {/local/Fall_2021/smadhadi/cse489589_assignment2/grader} > ./sanity_tests -p ../smadhadi/gbn -r ./run_experiments
Testing with MESSAGES:1000, LOSS:0.1, CORRUPTION:0.0, ARRIVAL:50, WINDOW:10 ...
Running simulator [10 Runs] ...
                                Done!
                                Done!
                                 Done!
 rass:
Testing with MESSAGES:1000, LOSS:0.2, CORRUPTION:0.0, ARRIVAL:50, WINDOW:10 ...
Running simulator [10 Runs] ...
                                Done!
                                Done!
                                Done!
                                 Done!
 ASS!
  esting with MESSAGES:1000, LOSS:0.4, CORRUPTION:0.0, ARRIVAL:50, WINDOW:10 ...
 unning simulator [10 Runs] ...
 un#1 [seed=1234] ...
un#2 [seed=1111] ...
un#3 [seed=2222] ...
un#4 [seed=3333] ...
                                 Done!
                                 Done!
                                 Done!
                                 Done!
```

```
LOSS:0.6, CORRUPTION:0.0, ARRIVAL:50, WINDOW:10
Running simulator [10 Runs] ...
           [seed=1234]
[seed=1111]
                                         Done
                                         Done!
          [seed=2222]
[seed=3333]
                                         Done
          [seed=5555]
                                         Done!
  tun#8 [seed=7777]
tun#9 [seed=8888]
                                         Done!
  un#10 [seed=9999] ...
Running simulator [10 Runs] ...
          [seed=3555]
[seed=4444]
[seed=5555]
                                         Done!
 Run#O [seed=5555] .
Run#7 [seed=6666] .
Run#8 [seed=7777] .
Run#9 [seed=8888] .
Run#10 [seed=9999]
                                         Done!
                                         Done!
Testing with MESSAGES:1000, LOSS:0.0, CORRUPTION:0.1, ARRIVAL:50, WINDOW:10 ...
Running simulator [10 Runs] ...
 Run#1 [seed=1234] ...
Run#2 [seed=12111] ...
Run#3 [seed=2222] ...
Run#4 [seed=3333] ...
Run#5 [seed=4444] ...
Run#6 [seed=5555] ...
                                         Done!
                                         Done!
                                         Done!
                                         Done!
                                         Done!
 Run#7 [seed=5555]
Run#7 [seed=6666]
Run#8 [seed=7777]
Run#9 [seed=8888]
                                         Done!
                                         Done!
                                         Done!
  tun#10 [seed=9999] ... Done!
PASS!
```

```
Running simulator [10 Runs] ...
 Run#1 [seed=1234]
Run#2 [seed=1111]
                                           Done!
 kun#2 [seed=1111]
kun#3 [seed=2222]
kun#4 [seed=3333]
kun#5 [seed=4444]
kun#6 [seed=5555]
kun#7 [seed=6666]
                                            Done!
                                            Done!
  un#7 [seed=0000]
un#8 [seed=7777]
un#9 [seed=8888]
un#10 [seed=9999]
                                            Done!
  ASS:
esting with MESSAGES:20, LOSS:1.0, CORRUPTION:0.0, ARRIVAL:50, WINDOW:50 ...
Running simulator [10 Runs] ...
 tun#1 [seed=1234]
tun#2 [seed=1111]
                                           Done!
 kun#2 [seed=1111]
kun#3 [seed=2222]
kun#4 [seed=3333]
kun#5 [seed=4444]
kun#6 [seed=5555]
                                            Done!
  un#7 [seed=3333]
un#7 [seed=6666]
un#8 [seed=7777]
un#9 [seed=8888]
                                            Done!
                                            Done!
 esting with MESSAGES:20, LOSS:0.0, CORRUPTION:1.0, ARRIVAL:50, WINDOW:50 ...
Running simulator [10 Runs] ...
 Run#1 [seed=1234]
Run#2 [seed=1211]
Run#3 [seed=2222]
Run#4 [seed=3333]
Run#5 [seed=4444]
Run#6 [seed=5555]
Run#7 [seed=6666]
                                           Done!
                                            Done!
                                            Done!
                                            Done!
                                            Done!
SANITY TESTS: PASS
```

Basic test screenshots

```
Highpate (/local/Fall_2021/smadhadi/cse409589 assignment2/grader) > /basic_tests -p ../smadhadi/gbn -r ./run_experiments
Tesling with MESSAGES:20, LOSS:0.1, CORRUPTION:0.0, ARRIVAL:50, WINDOW:50 ...
Runal [seed=1234] ... Done!
Runal [seed=1234] ... Done!
Runal [seed=1234] ... Done!
Runal [seed=222] ... Done!
Runal [seed=3333] ... Done!
Runal [seed=3333] ... Done!
Runal [seed=6666] ... Done!
Runal [seed=69999] ... Done!
Runal [seed=9999] ... Done!
Runal [seed=234] ... Done!
Runal [seed=234] ... Done!
Runal [seed=3333] ... Done!
Runal [seed=3333] ... Done!
Runal [seed=3333] ... Done!
Runal [seed=3333] ... Done!
Runal [seed=6366] ... Done!
Runal [seed=6388] ... Done!
Runal [seed=6388] ... Done!
Runal [seed=9999] ... Done!
Runal [seed=9999] ... Done!
Runal [seed=234] ... Done!
Runal [seed=9999] ... Done!
Runal [seed=3333] ... Done!
Runal [seed=3333] ... Done!
Runal [seed=3333] ... Done!
Runal [seed=333] ... Done!
Runal [seed=6366] ... Done!
Runal [seed=5355] ... Done!
Runal [seed=6333] ... Done!
```

```
LOSS:0.0, CORRUPTION:0.1, ARRIVAL:50, WINDOW:50 .
Running simulator [10 Runs] ...
           [seed=1234]
[seed=1111]
                                          Done!
           [seed=2222]
[seed=3333]
[seed=4444]
[seed=5555]
[seed=6666]
                                           Done!
                                           Done!
          [seed=7777]
[seed=8888]
                                           Done!
                                           Done!
Testing with MESSAGES:20, LOSS:0.0, CORRUPTION:0.4, ARRIVAL:50, WINDOW:50 ...
Running simulator [10 Runs] ...
 Run#1 [seed=1234]
Run#2 [seed=1111]
Run#3 [seed=2222]
                                          Done!
                                          Done!
                                          Done!
 Lun#4 [seed=3333] . . Done!
Lun#5 [seed=4444] . . Done!
Lun#6 [seed=5555] . . Done!
Lun#7 [seed=6666] . Done!
Lun#8 [seed=7777] . Done!
Lun#9 [seed=8888] . Done!
Lun#10 [seed=9999] . . Done!
  esting with MESSAGES:20, LOSS:0.0, CORRUPTION:0.8, ARRIVAL:50, WINDOW:50 ...
Running simulator [10 Runs] ...
          [seed=1234]
[seed=1111]
[seed=2222]
[seed=3333]
[seed=4444]
[seed=5555]
                                          Done!
  lun#3
lun#4
                                          Done!
                                          Done!
  un#8 [seed=7777] ...
un#9 [seed=8888] ...
un#10 [seed=9999] ...
                                          Done!
                                           Done
BASIC TESTS: PASS
```

Advanced test screenshots

```
highgate {/local/Fall_2021/smadhadi/cse489589_assignment2/grader} > ./advanced_tests -p ../smadhadi/gbn -r ./run_experiments
Testing with MESSAGES:1000, LOSS:0.1, CORRUPTION:0.0, ARRIVAL:50, WINDOW:10 ...
Running simulator [10 Runs] ...
Running simulator
```

```
LOSS:0.4, CORRUPTION:0.0, ARRIVAL:50, WINDOW:10
Running simulator [10 Runs] ...
          [seed=1234]
[seed=1111]
[seed=2222]
[seed=3333]
[seed=4444]
[seed=5555]
[seed=6666]
         [seed=0000]
[seed=7777]
[seed=8888]
 ASS!
Running simulator [10 Runs] ...
          [seed=1234]
[seed=1111]
[seed=2222]
[seed=3333]
                                          Done!
         [seed=3333]
[seed=4444]
[seed=5555]
[seed=6666]
[seed=7777]
[seed=8888]
 un#9 [seed=8888] ... Done!
un#10 [seed=9999] ... Done!
Running simulator [10 Runs] ...
          [seed=1234]
[seed=1111]
[seed=2222]
[seed=3333]
[seed=4444]
[seed=5555]
[seed=6666]
         [seed=7777]
[seed=8888]
                                                    LOSS:0.0, CORRUPTION:0.1, ARRIVAL:50, WINDOW:10 ...
Running simulator [10 Runs] ...
          [seed=1234]
[seed=1111]
[seed=2222]
[seed=33333]
[seed=44444]
           [seed=5555]
[seed=6666]
 kunning simulator [10 Runs] ...
          [seed=1234]
[seed=1111]
[seed=2222]
[seed=3333]
                                          Done!
           [seed=4444]
[seed=5555]
[seed=6666]
  esting with MESSAGES:1000, LOSS:0.0, CORRUPTION:0.4, ARRIVAL:50, WINDOW:10 ...
Running simulator [10 Runs] ...
          [seed=1234]
[seed=1111]
[seed=2222]
[seed=3333]
```

```
Running simulator [10 Runs] ...
 Running simulator [10 |
Run#1 [seed=1234] ...
Run#2 [seed=1111] ...
Run#3 [seed=2222] ...
Run#4 [seed=3333] ...
Run#5 [seed=4444] ...
Run#6 [seed=5555] ...
Run#7 [seed=6666] ...
Run#8 [seed=7777] ...
Run#9 [seed=8888] ...
Run#10 [seed=9999] ...
PASS!
                                                                        Done!
                                                                        Done!
                                                                        Done!
                                                                        Done!
TROS:
Testing with MESSAGES:1000, LOSS:0.0, CORRUPTION:0.6, ARRIVAL:50, WINDOW:10 ...
Running simulator [10 Runs] ...
 Running simulator [10 F
Run#1 [seed=1234] . . .
Run#3 [seed=2222] . . .
Run#4 [seed=3333] . .
Run#5 [seed=4444] . . .
Run#6 [seed=5555] . .
Run#7 [seed=6666] . . .
Run#8 [seed=7777] . .
Run#8 [seed=8888] . . .
Run#10 [seed=9999] . . .
PASS!
                                                                        Done!
                                                                        Done!
                                                                       Done!
                                                                        Done!
PASS!
Testing with MESSAGES:1000, LOSS:0.0, CORRUPTION:0.8, ARRIVAL:50, WINDOW:10 ...
Running simulator [10 Runs] ...
 Running simulator [10 Run#1 [seed=1234] ... Run#3 [seed=2222] ... Run#4 [seed=3333] ... Run#5 [seed=4444] ... Run#6 [seed=5555] ... Run#7 [seed=6666] ... Run#8 [seed=7777] ... Run#9 [seed=8888] ... Run#10 [seed=9999] ... PASS!
                                                                       Done!
                                                                        Done!
ADVANCED TESTS: PASS
```