

## Stop and Wait

Cmd: python demo\_sender.py ss

```
C:\Users\Chang Ke\Desktop\5700\project03\hw3 correct>python demo_sender.py ss
MSG:0
Sending pkt: b'\x00\x01\x00\x00kqMSG:0'
Received packet: b'\x00\x02\x00\x00\xff\xfd'
MSG:1
Sending pkt: b'\x00\x01\x00\x01kpMSG:1'
Received packet: b'\x00\x02\x00\x01\x00\xfc'
Received corrupt packet: b'\x00\x02\x00\x01\x00\xfc'
Sending pkt: b'\x00\x01\x00\x01kpMSG:1'
Sending pkt: b'\x00\x01\x00\x01kpMSG:1'
Received packet: b'\x00\x02\x00\x01\xff\xfc'
MSG:2
Sending pkt: b'\x00\x01\x00\x00kqMSG:2'
Received packet: b'\x00\x02\x00\x00\xff\xfd'
MSG:3
Sending pkt: b'\x00\x01\x00\x01kpMSG:3'
Received packet: b'\x00\xfd\x00\x01\xff\xfc'
Received corrupt packet: b'\x00\xfd\x00\x01\xff\xfc'
Sending pkt: b'\x00\x01\x00\x01kpMSG:3'
Received packet: b'\x00\x02\x00\x01\xff\xfc'
MSG:4
Sending pkt: b'\x00\x01\x00\x00kqMSG:4'
Received packet: b'\x00\x02\x00\x00\xff\xfd'
MSG:5
Sending pkt: b'\x00\x01\x00\x01kpMSG:5'
Received packet: b'\x00\x02\x00\x01\xff\xfc'
MSG:6
Sending pkt: b'\x00\x01\x00\x00kqMSG:6'
Received packet: b'\x00\x02\x00\x00\xff\xfd'
MSG:7
Sending pkt: b'\x00\x01\x00\x01kpMSG:7'
Received packet: b'\x00\x02\x00\x01\xff\xfc'
MSG:8
Sending pkt: b'\x00\x01\x00\x00kqMSG:8'
Received packet: b'\x00\x02\x00\x00\xff\xfd'
MSG:9
Sending pkt: b'\x00\x01\x00\x01kpMSG:9'
Received packet: b'\x00\x02\x00\x01\xff\xfc'
MSG:10
Sending pkt: b'\x00\x01\x00\x00kqMSG:10'
Sending pkt: b'\x00\x01\x00\x00kqMSG:10'
Received packet: b'\x00\x02\x00\x00\xff\xfd'
MSG:11
Sending pkt: b'\x00\x01\x00\x01kpMSG:11'
Received packet: b'\x00\x02\x00\x01\xff\xfc'
MSG:12
Sending pkt: b'\x00\x01\x00\x00kqMSG:12'
Sending pkt: b'\x00\x01\x00\x00kqMSG:12'
```

CMD: python demo\_receiver.py ss

```
C:\Users\Chang Ke\Desktop\5700\project03\hw3 correct>python demo_receiver.py
Received packet: b'\x00\x01\x00\x00kqMSG:0'
Received seq number: 0
Expected seq number: 0
b'MSG:0'
Received packet: b'\x00\x01\x00\x01kpMSG:1'
Received seq number: 1
Expected seq number: 1
b'MSG:1'
Received packet: b'\x00\x01\x00\x01kpMSG:1'
Received seq number: 1
Expected seq number: 0
Received packet: b'\x00\x01\x00\x00kqMSG:\xcd'
Received seq number: 0
Expected seq number: 0
b'MSG:\xcd'
Received packet: b'\x00\x01\x00\x01kpMSG:3'
Received seq number: 1
Expected seq number: 1
b'MSG:3'
Received packet: b'\x00\x01\x00\x01kpMSG:3'
Received seq number: 1
Expected seq number: 0
Received packet: b'\x00\x01\x00\x00kqMSG:4'
Received seq number: 0
Expected seq number: 0
b'MSG:4'
Received packet: b'\x00\x01\x00\x01kpMSG:5'
Received seq number: 1
Expected seq number: 1
b'MSG:5'
Received packet: b'\x00\x01\x00\x00kqMSG:6'
Received seq number: 0
Expected seq number: 0
b'MSG:6'
Received packet: b'\x00\x01\x00\x01kpMSG:7'
Received seq number: 1
Expected seq number: 1
b'MSG:7'
Received packet: b'\x00\x01\x00\x00kqMSG:\xc7'
Received seq number: 0
Expected seq number: 0
b'MSG:\xc7'
Received packet: b'\x00\x01\x00\x01kpMSG:9'
Received seq number: 1
Expected seq number: 1
b'MSG:9'
Received packet: b'\x00\x01\x00\x00kqMSG:10'
```

CMD: python file\_receiver.py ss out.txt

```
C:\Users\Chang Ke\Desktop\5700\project03\hw3 correct>
C:\Users\Chang Ke\Desktop\5700\project03\hw3 correct>
C:\Users\Chang Ke\Desktop\5700\project03\hw3 correct>python md5.py test.txt
b'\x19n8\xde\xa5\xa6V\xfcn44&@\xb7\xc4p'

C:\Users\Chang Ke\Desktop\5700\project03\hw3 correct>python file_receiver.py ss
test.txt
Traceback (most recent call last):
  File "file_receiver.py", line 22, in <module>
    assert not os.path.exists(file_name)
AssertionError

C:\Users\Chang Ke\Desktop\5700\project03\hw3 correct>python file_receiver.py ss
out.txt
Received packet: b'\x00\x01\x00\x00o\xf5In the summer of 1922, Nick writes, he
had just arrived in New York, where he moved to work in the bond business, and r
ented a house on a part of Long Island called West Egg. Unlike the conservative,
aristocratic East Egg, West Egg is home to the \xa1\xb0new rich,\xa1\xb1 those
who, having made their fortunes recently, have neither the social connections no
r the refinement to move among the East Egg set. West Egg is characterized by la
vish displays of wealth and garish poor taste. Nick\xa1\xafs comparatively mode

Received seq number: 0
Expected seq number: 0
Received packet: b'\x00\x01\x00\x00o\xf5In the summer of 1922, Nick writes, he
had just arrived in New York, where he moved to work in the bond business, and r
ented a house on a part of Long Island called West Egg. Unlike the conservative,
aristocratic East Egg, West Egg is home to the \xa1\xb0new rich,\xa1\xb1 those
who, having made their fortunes recently, have neither the social connections no
r the refinement to move among the East Egg set. West Egg is characterized by la
vish displays of wealth and garish poor taste. Nick\xa1\xafs comparatively mode

Received seq number: 0
Expected seq number: 1
Received packet: b'\x00\x01\x00\x01\x8dAst West Egg house is next door to Gatsk
y\xa1\xafs mansion, a sprawling Gothic monstrosity.\r\n\r\nNick is unlike his We
st Egg neighbors; whereas they lack social connections and aristocratic pedigree
s, Nick graduated from Yale and has many connections on East Egg. One night, he
drives out to East Egg to have dinner with his cousin Daisy and her husband, Tom
Buchanan, a former member of Nick\xa1\xafs social club at Yale. Tom, a powerfu
figure dressed in riding clothes, greets Nick on the porch. Inside, Daisy lo'

Received seq number: 1
Expected seq number: 1
Received packet: b'\x00\x01\x00\x00\xad\x81unges on a couch with her friend Jor
dan Baker, a competitive golfer who yawns as though bored by her surroundings.\r
\n\r\nTom tries to interest the others in a book called The Rise of the Colored
Empires by a man named Goddard. The book espouses racist, white-supremacist atti
tudes that Tom seems to find convincing. Daisy teases Tom about the book but is
```

CMD: python file\_sender.py ss test.txt

```
C:\Users\Chang Ke\Desktop\5700\project03\hw3 correct>python file_sender.py ss test.txt
MSG of length 500
Sending pkt: b'\x00\x01\x00\x00\xf5In the summer of 1922, Nick writes, he
just arrived in New York, where he moved to work in the bond business, and
d a house on a part of Long Island called West Egg. Unlike the conservative
stocratic East Egg, West Egg is home to the \xa1\xb0new rich,\xa1\xb1 those
having made their fortunes recently, have neither the social connections no
e refinement to move among the East Egg set. West Egg is characterized by la
displays of wealth and garish poor taste. Nick\xa1\xafs comparatively mode
Sending pkt: b'\x00\x01\x00\x00\xf5In the summer of 1922, Nick writes, he
just arrived in New York, where he moved to work in the bond business, and
d a house on a part of Long Island called West Egg. Unlike the conservative
stocratic East Egg, West Egg is home to the \xa1\xb0new rich,\xa1\xb1 those
having made their fortunes recently, have neither the social connections no
e refinement to move among the East Egg set. West Egg is characterized by la
displays of wealth and garish poor taste. Nick\xa1\xafs comparatively mode
Received packet: b'\x00\x02\x00\x00\xff\xfd'
MSG of length 500
Sending pkt: b'\x00\x01\x00\x01\x8dAst West Egg house is next door to Gatsb
l\xafs mansion, a sprawling Gothic monstrosity.\r\n\r\nNick is unlike his We
gg neighbors; whereas they lack social connections and aristocratic pedigree
ick graduated from Yale and has many connections on East Egg. One night, he
es out to East Egg to have dinner with his cousin Daisy and her husband, Tom
hanan, a former member of Nick\xa1\xafs social club at Yale. Tom, a powerfu
ure dressed in riding clothes, greets Nick on the porch. Inside, Daisy lo'
Received packet: b'\x00\x02\x00\x01\xff\xfc'
MSG of length 500
Sending pkt: b'\x00\x01\x00\x00\xad\x81unges on a couch with her friend Jor
Baker, a competitive golfer who yawns as though bored by her surroundings.\r
\r\nTom tries to interest the others in a book called The Rise of the Colored
res by a man named Goddard. The book espouses racist, white-supremacist atti
s that Tom seems to find convincing. Daisy teases Tom about the book but is
rrupted when Tom leaves the room to take a phone call. Daisy follows him hur
ly, and Jordan tells Nick that the call is from Tom\xa1\xafs lover in '
Received packet: b'\x00\x02\x00\x00\xff\xfd'
MSG of length 500
Sending pkt: b'\x00\x01\x00\x01\x83%New York.\r\n\r\nAfter an awkward dinne
he party breaks up. Jordan wants to go to bed because she has a golf tourna
the next day. As Nick leaves, Tom and Daisy hint that they would like for h
take a romantic interest in Jordan.\r\n\r\nWhen Nick arrives home, he sees
by for the first time, a handsome young man standing on the lawn with his ar
eaching out toward the dark water. Nick looks out at the water, but all he c
ee is a distant green light that might mark the end of a dock.In '
Received packet: b'\x00\x02\x00\xfe\xff\xfc'
Received corrupt packet: b'\x00\x02\x00\xfe\xff\xfc'
```

CMD: python md5.py test.txt

python md5.py out.txt

```
C:\Windows\system32\cmd.exe
C:\Users\Chang Ke\Desktop\5700\project03\hw3 correct>python md5.py test.txt
b'\x19n8\xde\xa5\xa6Y\xfcn44&@\xb7\xc4p'

C:\Users\Chang Ke\Desktop\5700\project03\hw3 correct>python md5.py out.txt
b'\x19n8\xde\xa5\xa6Y\xfcn44&@\xb7\xc4p'
```

## Go Back N:

Cmd: python demo\_sender.py gnb

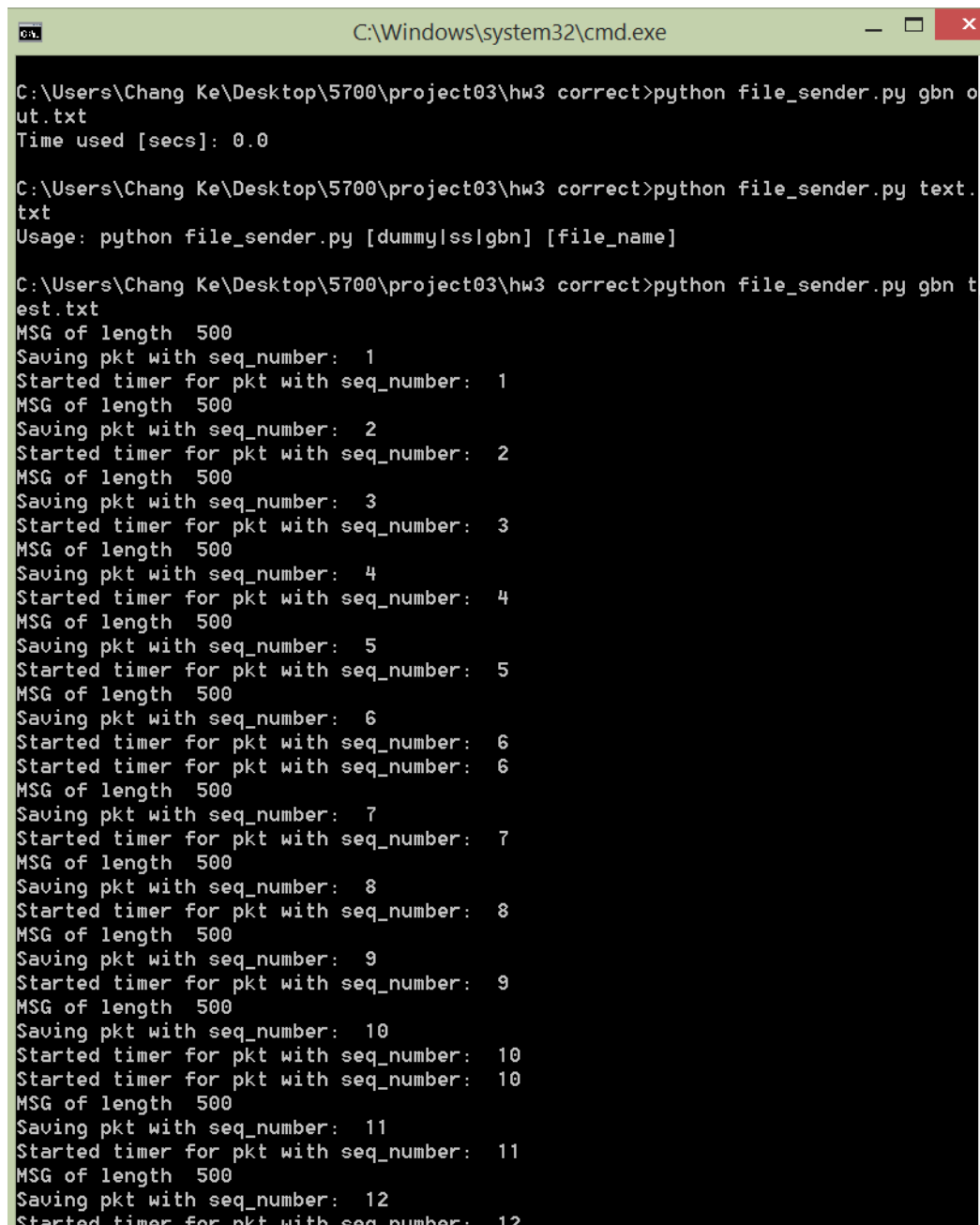
```
AssertionError
C:\Windows\system32\cmd.exe
C:\Users\Chang Ke\Desktop\5700\project03\hw3 correct>python demo_sender.py gbn
MSG:0
Saving pkt with seq_number: 1
Started timer for pkt with seq_number: 1
Started timer for pkt with seq_number: 1
Started timer for pkt with seq_number: 1
Started timer for pkt with seq_number: 1
MSG:1
Saving pkt with seq_number: 2
Started timer for pkt with seq_number: 2
Started timer for pkt with seq_number: 2
MSG:2
Saving pkt with seq_number: 3
Started timer for pkt with seq_number: 3
MSG:3
Saving pkt with seq_number: 4
Started timer for pkt with seq_number: 4
MSG:4
Saving pkt with seq_number: 5
Started timer for pkt with seq_number: 5
MSG:5
Saving pkt with seq_number: 6
Started timer for pkt with seq_number: 6
MSG:6
Saving pkt with seq_number: 7
Started timer for pkt with seq_number: 7
Started timer for pkt with seq_number: 7
Started timer for pkt with seq_number: 7
MSG:7
Saving pkt with seq_number: 8
Started timer for pkt with seq_number: 8
Started timer for pkt with seq_number: 8
MSG:8
Saving pkt with seq_number: 9
Started timer for pkt with seq_number: 9
MSG:9
Saving pkt with seq_number: 10
Started timer for pkt with seq_number: 10
MSG:10
Saving pkt with seq_number: 11
Started timer for pkt with seq_number: 11
MSG:11
Saving pkt with seq_number: 12
Started timer for pkt with seq_number: 12
MSG:12
Saving pkt with seq_number: 13
Started timer for pkt with seq_number: 13
```

CMD: python demo\_receiver.py gbn

```
C:\Windows\system32\cmd.exe - python demo_receiver.py gbn
C:\Users\Chang Ke\Desktop\5700\project03\hw3 correct>^Z
C:\Users\Chang Ke\Desktop\5700\project03\hw3 correct>
C:\Users\Chang Ke\Desktop\5700\project03\hw3 correct>python demo_receiver.py gbn

b'MSG:0'
b'MSG:1'
b'MSG:2'
b'MSG:3'
b'MSG:4'
b'MSG:5'
b'MSG:6'
b'MSG:7'
b'MSG:\xc7'
b'MSG:9'
b'MSG:10'
b'MSG:11'
b'MSG:12'
b'MSG:13'
b'MSG:14'
b'MSG:15'
b'MSG:16'
b'MSG:17'
b'MSG:18'
b'MSG:19'
```

CMD: python file\_sender.py gbn out.txt



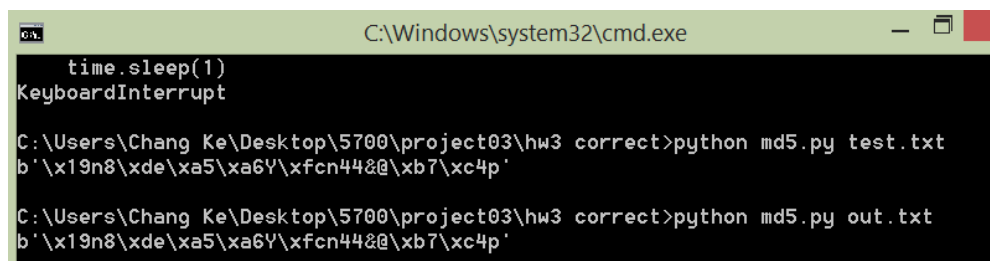
```
C:\Windows\system32\cmd.exe

C:\Users\Chang Ke\Desktop\5700\project03\hw3 correct>python file_sender.py gbn out.txt
Time used [secs]: 0.0

C:\Users\Chang Ke\Desktop\5700\project03\hw3 correct>python file_sender.py text.txt
Usage: python file_sender.py [dummy|ssl|gbn] [file_name]

C:\Users\Chang Ke\Desktop\5700\project03\hw3 correct>python file_sender.py gbn test.txt
MSG of length 500
Saving pkt with seq_number: 1
Started timer for pkt with seq_number: 1
MSG of length 500
Saving pkt with seq_number: 2
Started timer for pkt with seq_number: 2
MSG of length 500
Saving pkt with seq_number: 3
Started timer for pkt with seq_number: 3
MSG of length 500
Saving pkt with seq_number: 4
Started timer for pkt with seq_number: 4
MSG of length 500
Saving pkt with seq_number: 5
Started timer for pkt with seq_number: 5
MSG of length 500
Saving pkt with seq_number: 6
Started timer for pkt with seq_number: 6
Started timer for pkt with seq_number: 6
MSG of length 500
Saving pkt with seq_number: 7
Started timer for pkt with seq_number: 7
MSG of length 500
Saving pkt with seq_number: 8
Started timer for pkt with seq_number: 8
MSG of length 500
Saving pkt with seq_number: 9
Started timer for pkt with seq_number: 9
MSG of length 500
Saving pkt with seq_number: 10
Started timer for pkt with seq_number: 10
Started timer for pkt with seq_number: 10
MSG of length 500
Saving pkt with seq_number: 11
Started timer for pkt with seq_number: 11
MSG of length 500
Saving pkt with seq_number: 12
Started timer for pkt with seq_number: 12
```

CMD: python md5.py gbn test.txt  
python md5.py gbn out.txt



```
C:\Windows\system32\cmd.exe

time.sleep(1)
KeyboardInterrupt

C:\Users\Chang Ke\Desktop\5700\project03\hw3 correct>python md5.py test.txt
b'\x19n8\xde\xa5\xa6Y\xfcn44&@\xb7\xc4p'

C:\Users\Chang Ke\Desktop\5700\project03\hw3 correct>python md5.py out.txt
b'\x19n8\xde\xa5\xa6Y\xfcn44&@\xb7\xc4p'
```

## Some conclusion:

The bit error probability results in different md5 signature.

Smaller error probability and smaller RTT makes transaction a lot faster, but sender follows the same gbn procedure whether it has bit error or not.