COMPSCI 711 A2 report

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There are 2 way that can run the program.
1. Double click to run the run.bat file
2. Open 5 separate IDEs and run each of them, also the Network.exe which is not included in the zip file.

Here are some points need to be noticed:
1. My code for the Ready list part does use the total ordering of multicast, although it is not reflected clearly in the GUI.
   That is, when the middleware receives the message sent from the Network, it assigns a current received message number (timestamp) to the message and saves it to the holding queue, and then sends the timestamp to the sender, that is, another middleware such as M1. M1 gets M2-M5' timestamps for the current message to obtain a maximum value, integrates the current message with the maximum value into an "agreed timestamp message" and sends it to M2-M5. Then M1-M5 updates the current message in the holding queue to the "agreed timestamp message. If the first index of the holding queue is an updated message, it is added to the Ready list and removed from the holding queue.
2. Please be patient. In order to ensure that the time when each middleware sends the timestamp is after the time when the message is received, I added Thread.sleep(20000) in the sender part; otherwise some middleware will appear "SocketException: Connection reset by peer: socket write error"
3. After clicking the Send button of M1 normally, please wait for the operation to complete and then click the next event. This works fine. But please do not try to click M2 immediately after clicking M1, it will cause the program to get stuck

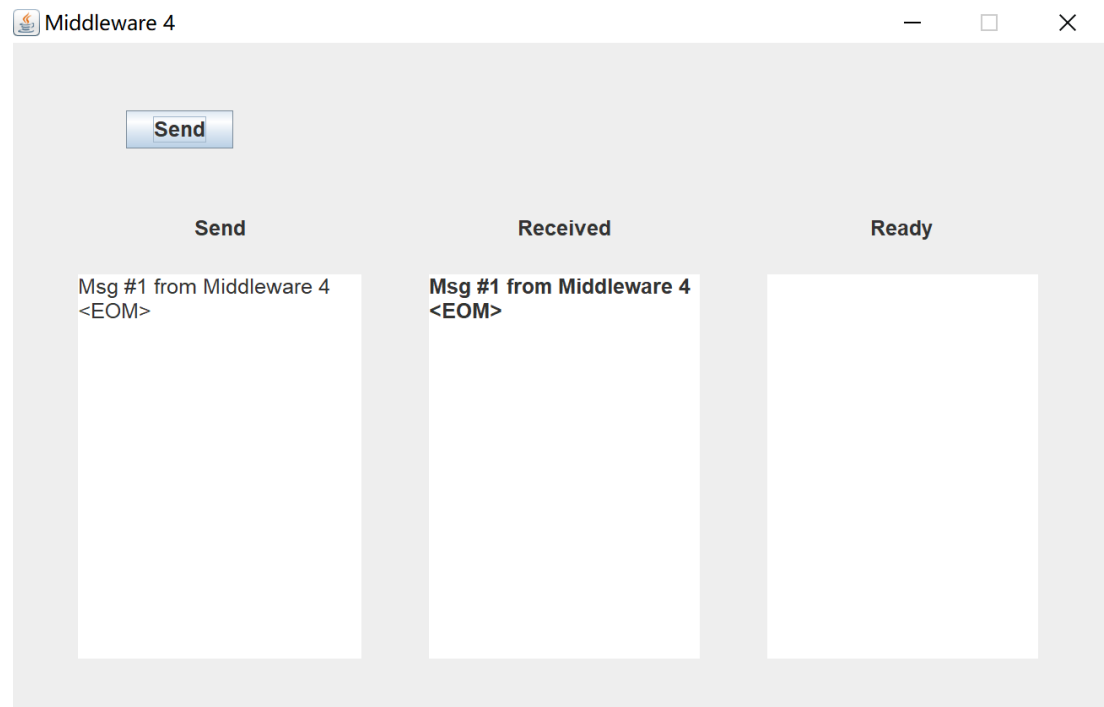The initial GUI for each middleware looks like:
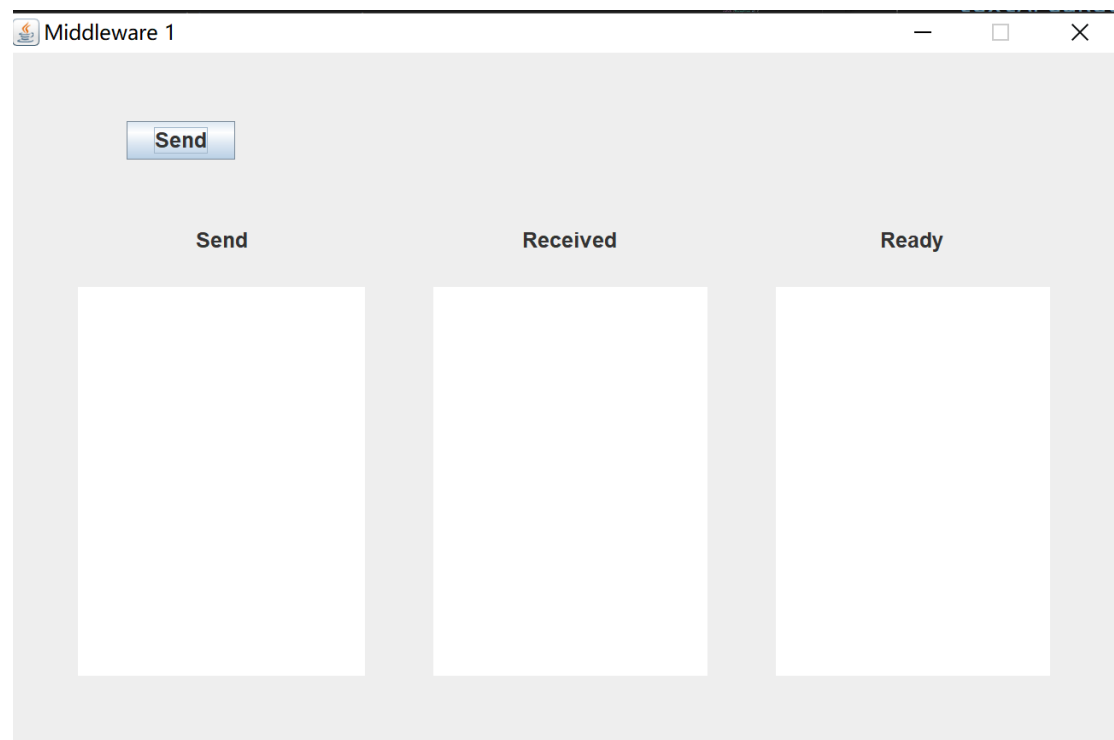
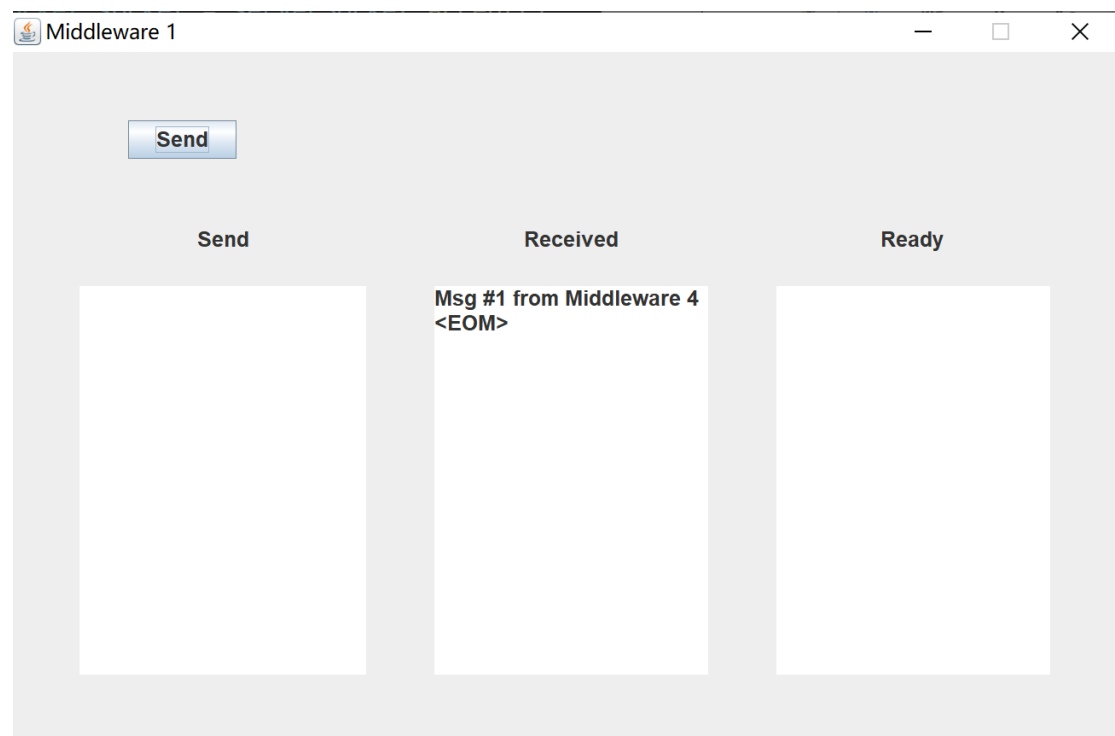Once click the Send button on Middleware 4
The Network.exe will show

The M4 GUI will show

Middleware 4   —   □   ✕

[**Send**]

Send	Received	Ready
Msg #1 from Middleware 4 <EOM>	**Msg #1 from Middleware 4 <EOM>**	

The M1 – M3 and M5 GUI will show

Middleware 1   —   □   ✕

[**Send**]

Send	Received	Ready
	Msg #1 from Middleware 4 <EOM>	

After times, the Ready list will show words:

Middleware 4 — □ ✕

Send

Send	Received	Ready
Msg #1 from Middleware 4 <EOM>	Msg #1 from Middleware 4 <EOM>	Msg #1 from Middleware 4 timestamp 1 <EOM>*

Middleware 2 — □ ✕

Send

Send	Received	Ready
	Msg #1 from Middleware 4 <EOM>	Msg #1 from Middleware 4 timestamp 1 <EOM>*