

# LOGICAL

***NOTES: If you are running for 2 processes that is the first line in the input file is 2, then the command for command line on putty will be np-2.***

***If you are running for 5 processes that is the first line in the input file is 5, then the command for command line on putty will be np-5.***

***In case, any confusion, please refer to the below screen shots, I have captured screen shots clearly with all the commands that I used.***

Also, the screen shots have some unnecessary warning. That is not from my program but due to joker server out of memory issue. Initially it was not even running, but I found a temporary solution on google which was creating MPI session and this made the code run.

If the Joker out of memory problem gets resolved, it should run and compile without all those warning messages which you will notice in below screen shots.

I compiled on local server, it run perfectly.

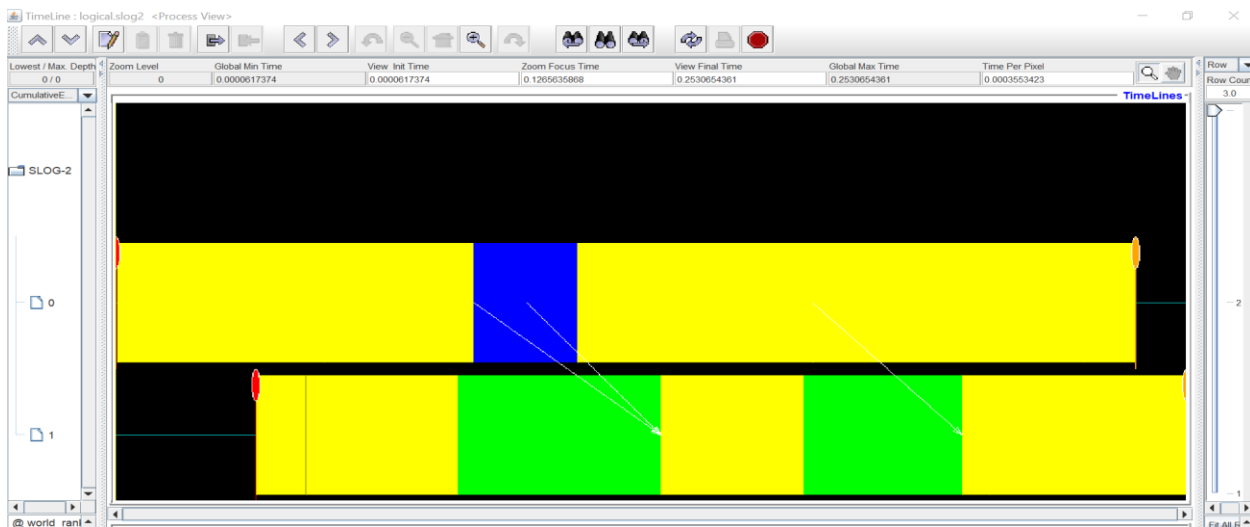
I have given Complete screen shots of the outputs. Also, have validated the test cases. It appears to be fully correct

Test Case# 1(no line change in below input file,since 1 line in my code means 1 command(whether it is exec or send)

```
1 2
2 exec 1
3 send 1 2 "silly message"
4 send 1 2 "res messaf"
5 end
```

```
umehta@joker:~/UKM_Logical
Local host: joker.tamucc.edu
Filename: /home/students/umehta/uk10/openmpi-sessions-8578@joker_0/40607/1/shared_mem_p
ool.joker

You can set the MCA paramter shmем_mmap_enable_nfs_warning to 0 to
disable this message.
-----
There are 2 processes in the system
Execution event in process 0
Logical time at process 0 is 1
Message sent from process 0 to process 1: silly message
Logical time at process 0 is: 2
Message received from process 0 by process 1: silly message
Logical time at process 1 is: 3
Message sent from process 0 to process 1: res messaf
Logical time at process 0 is: 3
Message received from process 0 by process 1: res messaf
Logical time at process 1 is: 4
[joker.tamucc.edu:22188] 3 more processes have sent help message help-opal-shmem-mmap.txt /
mmap on nfs
[joker.tamucc.edu:22188] Set MCA parameter "orte_base_help_aggregate" to 0 to see all help
/ error messages
[umehta@joker UKM_Logical]$
```



TestCase #2

```
logical.cpp logical.txt logical1.txt
1 5
2 exec 1
3 exec 1
4 send 2 3 "hello3"
5 send 2 1 "hello1"
6 send 3 1 "hello1"
7 exec 4
8 exec 4
9 send 4 5 "hello 5"
10 exec 5
11 exec 1
12 send 1 5 "hello 5"
13 exec 3
14 end
15
```

```
umehta@joker:~/UKM_Logical
There are 5 processes in the system
Execution event in process 0
Logical time at process 0 is 1
Execution event in process 0
Logical time at process 0 is 2
Message sent from process 1 to process 2: hello3"
Logical time at process 1 is: 1
Message received from process 1 by process 2: hello3"
Logical time at process 2 is: 2
Message sent from process 1 to process 0: hello1"
Logical time at process 1 is: 2
Message received from process 1 by process 0: hello1"
Logical time at process 0 is: 3
Message sent from process 2 to process 0: hello1"
Logical time at process 2 is: 3
Message received from process 2 by process 0: hello1"
Logical time at process 0 is: 4
Execution event in process 3
Logical time at process 3 is 1
Execution event in process 3
Logical time at process 3 is 2
Message sent from process 3 to process 4: hello 5"
Logical time at process 3 is: 3
```

```
umehta@joker:~/UKM_Logical
Logical time at process 2 is: 3
Message received from process 2 by process 0: hello1"
Logical time at process 0 is: 4
Execution event in process 3
Logical time at process 3 is 1
Execution event in process 3
Logical time at process 3 is 2
Message sent from process 3 to process 4: hello 5"
Logical time at process 3 is: 3
Message received from process 3 by process 4: hello 5"
Logical time at process 4 is: 4
Execution event in process 4
Logical time at process 4 is 5
Execution event in process 0
Logical time at process 0 is 5
Message sent from process 0 to process 4: hello 5"
Logical time at process 0 is: 6
Message received from process 0 by process 4: hello 5"
Logical time at process 4 is: 7
Execution event in process 2
Logical time at process 2 is 4
[joker.tamucc.edu:22469] 6 more processes have sent help message help-opal-shmem-mmap.txt /
mmap on nfs
```

### Test Case #3

```
logical.cpp logical.txt logical1.txt logical2.txt
1 6
2 exec 1
3 send 1 2 "mes12"
4 exec 2
5 send 2 1 "mes21"
6 exec 2
7 send 2 3 "mes23"
8 exec 2
9 send 2 1 "mes21"
10 exec 3
11 send 3 2 "mes32"
12 exec 1
13 send 1 3 "mes13"
14 exec 3
15 send 3 6 "mes36"
16 end
```

```
umehta@joker:~/UKM_Logical
-----
There are 6 processes in the system
Execution event in process 0
Logical time at process 0 is 1
Message sent from process 0 to process 1: mes12"
Logical time at process 0 is: 2
Message received from process 0 by process 1: mes12"
Logical time at process 1 is: 3
Execution event in process 1
Logical time at process 1 is 4
Message sent from process 1 to process 0: mes21"
Logical time at process 1 is: 5
Message received from process 1 by process 0: mes21"
Logical time at process 0 is: 6
Execution event in process 1
Logical time at process 1 is 6
Message sent from process 1 to process 2: mes23"
Logical time at process 1 is: 7
Message received from process 1 by process 2: mes23"
Logical time at process 2 is: 8
Execution event in process 1
Logical time at process 1 is 8
Message sent from process 1 to process 0: mes21"
```

```
umehta@joker:~/UKM_Logical
Logical time at process 1 is 8
Message sent from process 1 to process 0: mes21"
Logical time at process 1 is: 9
Message received from process 1 by process 0: mes21"
Logical time at process 0 is: 10
Execution event in process 2
Logical time at process 2 is 9
Message sent from process 2 to process 1: mes32"
Logical time at process 2 is: 10
Message received from process 2 by process 1: mes32"
Logical time at process 1 is: 11
[joker.tamucc.edu:22623] 7 more processes have sent help message help-opal-shmem-mmap.txt /
mmap on nfs
[joker.tamucc.edu:22623] Set MCA parameter "orte_base_help_aggregate" to 0 to see all help
/ error messages
Execution event in process 0
Logical time at process 0 is 11
Message sent from process 0 to process 2: mes13"
Logical time at process 0 is: 12
Message received from process 0 by process 2: mes13"
Logical time at process 2 is: 13
Execution event in process 2
Logical time at process 2 is 14
```

```
umehta@joker:~/UKM_Logical
Execution event in process 2
Logical time at process 2 is 9
Message sent from process 2 to process 1: mes32"
Logical time at process 2 is: 10
Message received from process 2 by process 1: mes32"
Logical time at process 1 is: 11
[joker.tamucc.edu:22623] 7 more processes have sent help message help-opal-shmem-mmap.txt /
mmap on nfs
[joker.tamucc.edu:22623] Set MCA parameter "orte_base_help_aggregate" to 0 to see all help
/ error messages
Execution event in process 0
Logical time at process 0 is 11
Message sent from process 0 to process 2: mes13"
Logical time at process 0 is: 12
Message received from process 0 by process 2: mes13"
Logical time at process 2 is: 13
Execution event in process 2
Logical time at process 2 is 14
Message sent from process 2 to process 5: mes36"
Logical time at process 2 is: 15
Message received from process 2 by process 5: mes36"
Logical time at process 5 is: 16
[umehta@joker UKM_Logical]$
```

#### Test Case #4

```
logical.cpp logical.txt logical1.txt logical2.txt logical3.txt
1 5
2 exec 5
3 send 5 2 "mes12"
4 exec 2
5 send 2 5 "mes21"
6 exec 2
7 send 2 1 "mes23"
8 exec 3
9 send 3 4 "mes21"
10 exec 5
11 send 5 1 "mes32"
12 exec 2
13 send 2 3 "mes13"
14 exec 1
15 send 1 5 "mes36"
16 end
```

```
umehta@joker:~/UKM_Logical
ool.joker

You can set the MCA paramter shmем_mmap_enable_nfs_warning to 0 to
disable this message.
-----
There are 5 processes in the system
Execution event in process 4
Logical time at process 4 is: 1
Message sent from process 4 to process 1: mes12"
Logical time at process 4 is: 2
Message received from process 4 by process 1: mes12"
Logical time at process 1 is: 3
Execution event in process 1
Logical time at process 1 is 4
Message sent from process 1 to process 4: mes21"
Logical time at process 1 is: 5
Message received from process 1 by process 4: mes21"
Logical time at process 4 is: 6
Execution event in process 1
Logical time at process 1 is 6
Message sent from process 1 to process 0: mes23"
Logical time at process 1 is: 7
Message received from process 1 by process 0: mes23"
```

```
umehta@joker:~/UKM_Logical

Message sent from process 1 to process 0: mes23"
Logical time at process 1 is: 7
Message received from process 1 by process 0: mes23"
Logical time at process 0 is: 8
Execution event in process 2
Logical time at process 2 is 1
Message sent from process 2 to process 3: mes21"
Logical time at process 2 is: 2
Message received from process 2 by process 3: mes21"
Logical time at process 3 is: 3
Execution event in process 4
Logical time at process 4 is 7
Message sent from process 4 to process 0: mes32"
Logical time at process 4 is: 8
Message received from process 4 by process 0: mes32"
Logical time at process 0 is: 9
Execution event in process 1
Logical time at process 1 is 8
Message sent from process 1 to process 2: mes13"
Logical time at process 1 is: 9
Message received from process 1 by process 2: mes13"
Logical time at process 2 is: 10
Execution event in process 0
```

```
umehta@joker:~/UKM_Logical
Execution event in process 2
Logical time at process 2 is 1
Message sent from process 2 to process 3: mes21"
Logical time at process 2 is: 2
Message received from process 2 by process 3: mes21"
Logical time at process 3 is: 3
Execution event in process 4
Logical time at process 4 is 7
Message sent from process 4 to process 0: mes32"
Logical time at process 4 is: 8
Message received from process 4 by process 0: mes32"
Logical time at process 0 is: 9
Execution event in process 1
Logical time at process 1 is 8
Message sent from process 1 to process 2: mes13"
Logical time at process 1 is: 9
Message received from process 1 by process 2: mes13"
Logical time at process 2 is: 10
Execution event in process 0
Logical time at process 0 is 10
[joker.tamucc.edu:26754] 6 more processes have sent help message help-opal-shmem-mmap.txt /
mmap on nfs
[joker.tamucc.edu:26754] Set MCA parameter "orte_base_help_aggregate" to 0 to see all help
```

# VECTOR:

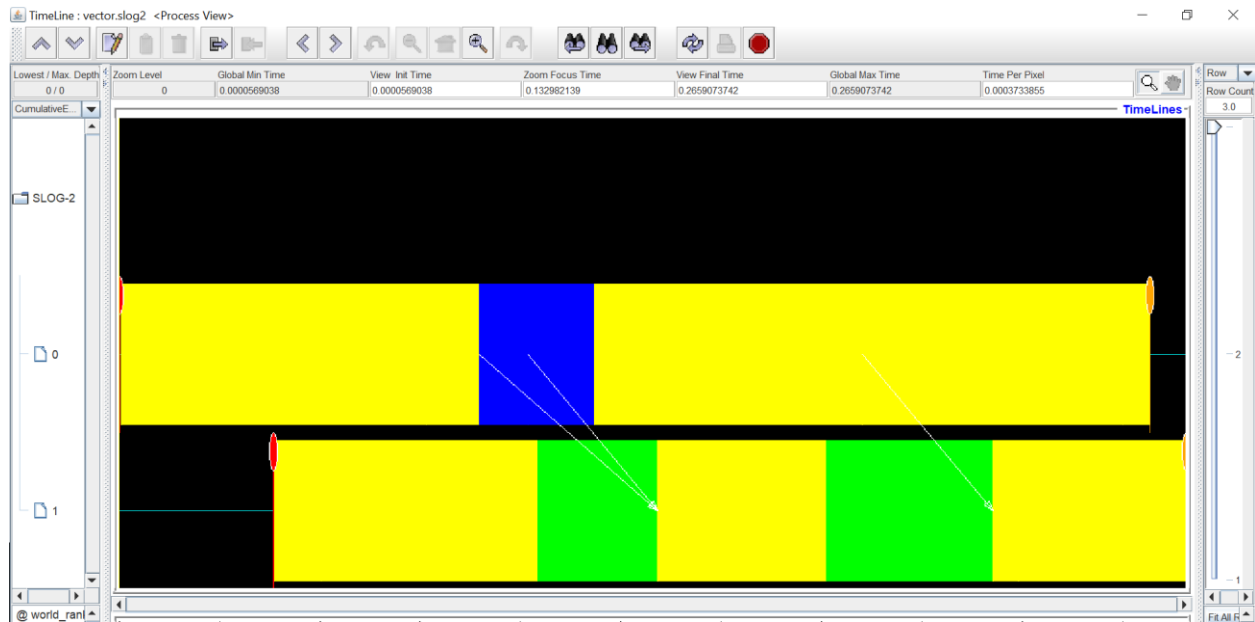
## TEST CASE #1

```
logical.cpp logical.txt logical1.txt logical2.txt logical3.txt vector.cpp
1 2
2 exec 1
3 send 1 2 "silly message"
4 send 1 2 "res messaf"
5 end
```



```
umehta@joker:~/UKM_Logical
[umehta@joker UKM_Logical]$ mpic++ vector.cpp -o vector
[umehta@joker UKM_Logical]$
```

```
umehta@joker:~/UKM_Logical
You can set the MCA paramter shmem_mmap_enable_nfs_warning to 0 to
disable this message.
-----
There are 2 processes in the system
Execution event in process 0
Vector time at process 0 is 1
Vector Value is 1 0
Message sent from process 0 to process 1: silly message
Vector time at process 0 is: 2
Vector Value is 2 0
Message received from process 0 by process 1: silly message
Vector time at process 1 is: 1
Vector Value is 2 1
Message sent from process 0 to process 1: res messaf
Vector time at process 0 is: 3
Vector Value is 3 0
Message received from process 0 by process 1: res messaf
Vector time at process 1 is: 2
Vector Value is 3 2
[joker.tamucc.edu:30439] 3 more processes have sent help message help-opal-shmem
-mmap.txt / mmap on nfs
[joker.tamucc.edu:30439] Set MCA parameter "orte_base_help_aggregate" to 0 to se
e all help / error messages
[umehta@joker UKM_Logical]$
```



## TEST CASE #2

```
vector.cpp x logical1.txt x
1 5
2 exec 1
3 exec 1
4 send 2 3 "hello3"
5 send 2 1 "hello1"
6 send 3 1 "hello1"
7 exec 4
8 exec 4
9 send 4 5 "hello 5"
10 exec 5
11 exec 1
12 send 1 5 "hello 5"
13 exec 3
14 end
15
```

```
umehta@joker:~/UKM_Logical

You can set the MCA paramter shmem_mmap_enable_nfs_warning to 0 to
disable this message.
-----
There are 5 processes in the system
Execution event in process 0
Vector time at process 0 is 1
Vector Value is 1 0 0 0 0
Execution event in process 0
Vector time at process 0 is 2
Vector Value is 2 0 0 0 0
Message sent from process 1 to process 2: hello3"
Vector time at process 1 is: 1
Vector Value is 0 1 0 0 0
Message received from process 1 by process 2: hello3"
Vector time at process 2 is: 1
Vector Value is 0 1 1 0 0
Message sent from process 1 to process 0: hello1"
Vector time at process 1 is: 2
Vector Value is 0 2 0 0 0
Message received from process 1 by process 0: hello1"
Vector time at process 0 is: 3
Vector Value is 3 2 0 0 0
Message sent from process 2 to process 0: hello1"
```

```
umehta@joker:~/UKM_Logical

Message sent from process 2 to process 0: hello1"
Vector time at process 2 is: 2
Vector Value is 0 1 2 0 0
Message received from process 2 by process 0: hello1"
Vector time at process 0 is: 4
Vector Value is 4 2 2 0 0
Execution event in process 3
Vector time at process 3 is 1
Vector Value is 0 0 0 1 0
Execution event in process 3
Vector time at process 3 is 2
Vector Value is 0 0 0 2 0
Message sent from process 3 to process 4: hello 5"
Vector time at process 3 is: 3
Vector Value is 0 0 0 3 0
Message received from process 3 by process 4: hello 5"
Vector time at process 4 is: 1
Vector Value is 0 0 0 3 1
Execution event in process 4
Vector time at process 4 is 2
Vector Value is 0 0 0 3 2
Execution event in process 0
Vector time at process 0 is 5
Vector Value is 5 2 2 0 0
```

```
umehta@joker:~/UKM_Logical
Vector Value is 0 0 0 3 0
Message received from process 3 by process 4: hello 5"
Vector time at process 4 is: 1
Vector Value is 0 0 0 3 1
Execution event in process 4
Vector time at process 4 is 2
Vector Value is 0 0 0 3 2
Execution event in process 0
Vector time at process 0 is 5
Vector Value is 5 2 2 0 0
[joker.tamucc.edu:31263] 6 more processes have sent help message help-opal-shmem
-mmmap.txt / mmap on nfs
[joker.tamucc.edu:31263] Set MCA parameter "orte_base_help_aggregate" to 0 to se
e all help / error messages
Message sent from process 0 to process 4: hello 5"
Vector time at process 0 is: 6
Vector Value is 6 2 2 0 0
Message received from process 0 by process 4: hello 5"
Vector time at process 4 is: 3
Vector Value is 6 2 2 3 3
Execution event in process 2
Vector time at process 2 is 3
Vector Value is 0 1 3 0 0
Writing logfile....
```

### TEST CASE #3

C:\Users\utkar\AppData\Local\Temp\scp10435\home\students\umehta\UKM\_Logical\log

File Edit Search View Encoding Language Settings Tools Macro Run Plugins Win



```
vector.cpp x logical1.txt x logical2.txt x
1 6
2 exec 1
3 send 1 2 "mes12"
4 exec 2
5 send 2 1 "mes21"
6 exec 2
7 send 2 3 "mes23"
8 exec 2
9 send 2 1 "mes21"
10 exec 3
11 send 3 2 "mes32"
12 exec 1
13 send 1 3 "mes13"
14 exec 3
15 send 3 6 "mes36"
16 end
```


```
umehta@joker:~/UKM_Logical
disable this message.
-----
There are 6 processes in the system
Execution event in process 0
Vector time at process 0 is 1
Vector Value is 1 0 0 0 0 0
Message sent from process 0 to process 1: mes12"
Vector time at process 0 is: 2
Vector Value is 2 0 0 0 0 0
Message received from process 0 by process 1: mes12"
Vector time at process 1 is: 1
Vector Value is 2 1 0 0 0 0
Execution event in process 1
Vector time at process 1 is 2
Vector Value is 2 2 0 0 0 0
Message sent from process 1 to process 0: mes21"
Vector time at process 1 is: 3
Vector Value is 2 3 0 0 0 0
[joker.tamucc.edu:31763] 7 more processes have sent help message help-opal-shmem
-mmmap.txt / mmap on nfs
[joker.tamucc.edu:31763] Set MCA parameter "orte_base_help_aggregate" to 0 to se
e all help / error messages
Message received from process 1 by process 0: mes21"
Vector time at process 0 is: 3
```

```
umehta@joker:~/UKM_Logical
Message received from process 1 by process 0: mes21"
Vector time at process 0 is: 3
Vector Value is 3 3 0 0 0 0
Execution event in process 1
Vector time at process 1 is 4
Vector Value is 2 4 0 0 0 0
Message sent from process 1 to process 2: mes23"
Vector time at process 1 is: 5
Vector Value is 2 5 0 0 0 0
Message received from process 1 by process 2: mes23"
Vector time at process 2 is: 1
Vector Value is 2 5 1 0 0 0
Execution event in process 1
Vector time at process 1 is 6
Vector Value is 2 6 0 0 0 0
Message sent from process 1 to process 0: mes21"
Vector time at process 1 is: 7
Vector Value is 2 7 0 0 0 0
Message received from process 1 by process 0: mes21"
Vector time at process 0 is: 4
Vector Value is 4 7 0 0 0 0
Execution event in process 2
Vector time at process 2 is 2
Vector Value is 2 5 2 0 0 0
```

```
umehta@joker:~/UKM_Logical
Execution event in process 2
Vector time at process 2 is 2
Vector Value is 2 5 2 0 0 0
Message sent from process 2 to process 1: mes32"
Vector time at process 2 is: 3
Vector Value is 2 5 3 0 0 0
Message received from process 2 by process 1: mes32"
Vector time at process 1 is: 8
Vector Value is 2 8 3 0 0 0
Execution event in process 0
Vector time at process 0 is 5
Vector Value is 5 7 0 0 0 0
Message sent from process 0 to process 2: mes13"
Vector time at process 0 is: 6
Vector Value is 6 7 0 0 0 0
Message received from process 0 by process 2: mes13"
Vector time at process 2 is: 4
Vector Value is 6 7 4 0 0 0
Execution event in process 2
Vector time at process 2 is 5
Vector Value is 6 7 5 0 0 0
Message sent from process 2 to process 5: mes36"
Vector time at process 2 is: 6
Vector Value is 6 7 6 0 0 0
```


```
umehta@joker:~/UKM_Logical
Message received from process 2 by process 1: mes32"
Vector time at process 1 is: 8
Vector Value is 2 8 3 0 0 0
Execution event in process 0
Vector time at process 0 is 5
Vector Value is 5 7 0 0 0 0
Message sent from process 0 to process 2: mes13"
Vector time at process 0 is: 6
Vector Value is 6 7 0 0 0 0
Message received from process 0 by process 2: mes13"
Vector time at process 2 is: 4
Vector Value is 6 7 4 0 0 0
Execution event in process 2
Vector time at process 2 is 5
Vector Value is 6 7 5 0 0 0
Message sent from process 2 to process 5: mes36"
Vector time at process 2 is: 6
Vector Value is 6 7 6 0 0 0
Message received from process 2 by process 5: mes36"
Vector time at process 5 is: 1
Vector Value is 6 7 6 0 0 1
Writing logfile....
Enabling the Default clock synchronization...
Finished writing logfile vector.clog2.
```

#### Test CASE #4

 C:\Users\utkar\AppData\Local\Temp\scp14306\home\students\umehta

File Edit Search View Encoding Language Settings Tools Macro R



 vector.cpp   logical1.txt   logical2.txt   logical3.txt 

```
1 5
2 exec 5
3 send 5 2 "mes12"
4 exec 2
5 send 2 5 "mes21"
6 exec 2
7 send 2 1 "mes23"
8 exec 3
9 send 3 4 "mes21"
10 exec 5
11 send 5 1 "mes32"
12 exec 2
13 send 2 3 "mes13"
14 exec 1
15 send 1 5 "mes36"
16 end
```



```
umehta@joker:~/UKM_Logical
disable this message.
-----
There are 5 processes in the system
Execution event in process 4
Vector time at process 4 is 1
Vector Value is 0 0 0 0 1
Message sent from process 4 to process 1: mes12"
Vector time at process 4 is: 2
Vector Value is 0 0 0 0 2
Message received from process 4 by process 1: mes12"
Vector time at process 1 is: 1
Vector Value is 0 1 0 0 2
Execution event in process 1
Vector time at process 1 is 2
Vector Value is 0 2 0 0 2
Message sent from process 1 to process 4: mes21"
Vector time at process 1 is: 3
Vector Value is 0 3 0 0 2
Message received from process 1 by process 4: mes21"
Vector time at process 4 is: 3
Vector Value is 0 3 0 0 3
Execution event in process 1
Vector time at process 1 is 4
Vector Value is 0 4 0 0 2
```

```
umehta@joker:~/UKM_Logical
Vector Value is 0 4 0 0 2
Message sent from process 1 to process 0: mes23"
Vector time at process 1 is: 5
Vector Value is 0 5 0 0 2
Message received from process 1 by process 0: mes23"
Vector time at process 0 is: 1
Vector Value is 1 5 0 0 2
Execution event in process 2
Vector time at process 2 is 1
Vector Value is 0 0 1 0 0
Message sent from process 2 to process 3: mes21"
Vector time at process 2 is: 2
Vector Value is 0 0 2 0 0
Message received from process 2 by process 3: mes21"
Vector time at process 3 is: 1
Vector Value is 0 0 2 1 0
Execution event in process 4
Vector time at process 4 is 4
Vector Value is 0 3 0 0 4
Message sent from process 4 to process 0: mes32"
Vector time at process 4 is: 5
Vector Value is 0 3 0 0 5
Message received from process 4 by process 0: mes32"
Vector time at process 0 is: 2
```

```
umehta@joker:~/UKM_Logical
Vector time at process 0 is: 2
Vector Value is 2 5 0 0 5
Execution event in process 1
Vector time at process 1 is 6
Vector Value is 0 6 0 0 2
Message sent from process 1 to process 2: mes13"
Vector time at process 1 is: 7
Vector Value is 0 7 0 0 2
Message received from process 1 by process 2: mes13"
Vector time at process 2 is: 3
Vector Value is 0 7 3 0 2
Execution event in process 0
Vector time at process 0 is 3
Vector Value is 3 5 0 0 5
Message sent from process 0 to process 4: mes36"
Vector time at process 0 is: 4
Vector Value is 4 5 0 0 5
Message received from process 0 by process 4: mes36"
Vector time at process 4 is: 6
Vector Value is 4 5 0 0 6
[joker.tamucc.edu:32085] 6 more processes have sent help message help-opal-shmem
-mmap.txt / mmap on nfs
[joker.tamucc.edu:32085] Set MCA parameter "orte_base_help_aggregate" to 0 to se
e all help / error messages
```

\*\*\*\*\*END\*\*\*\*\*