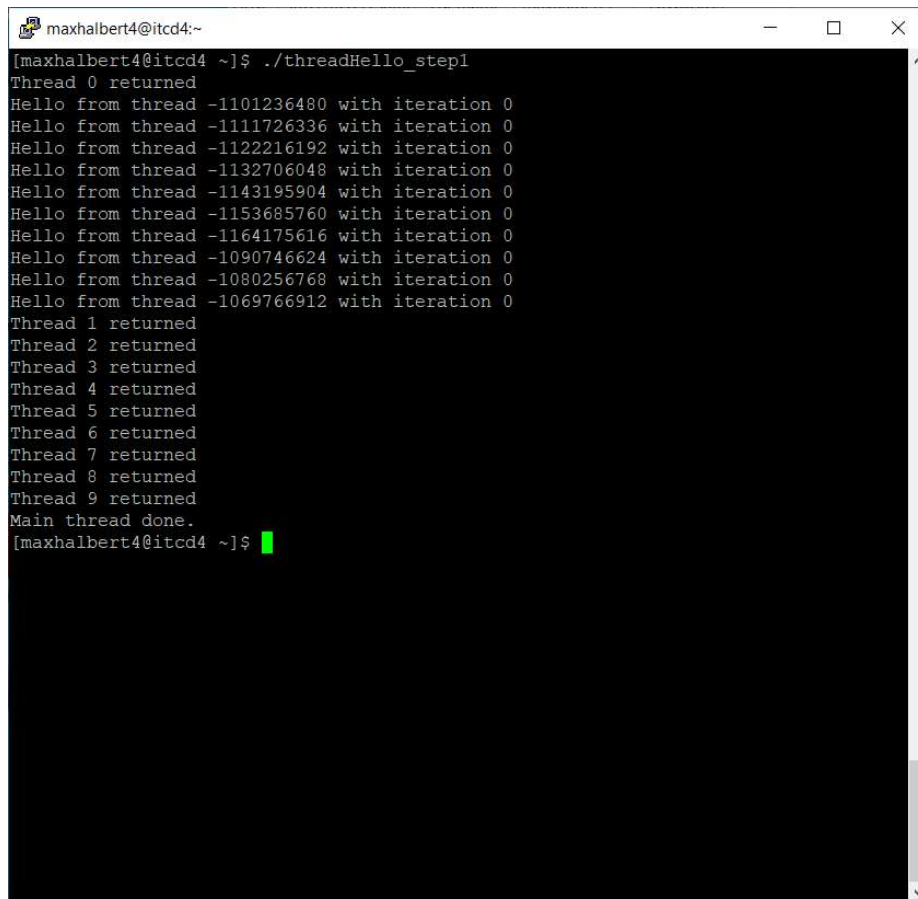


Max Halbert

Lab5 Test Run Result

1. Step 1 test run result:

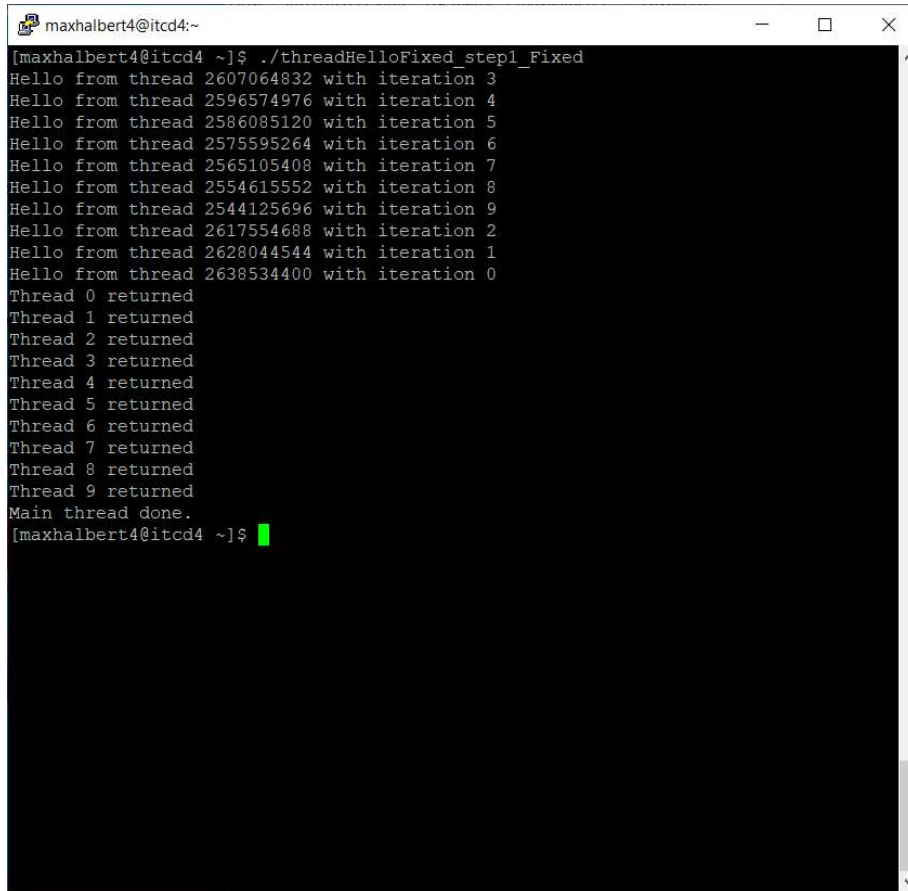
\$>./threadHello_step1

A terminal window titled 'maxhalbert4@itcd4:~' with standard window controls. The terminal shows the execution of the command './threadHello_step1'. The output consists of 10 'Hello from thread' messages, each followed by a thread ID and 'with iteration 0'. These are followed by 10 'Thread X returned' messages (Thread 0 to Thread 9) and a final 'Main thread done.' message. The prompt '[maxhalbert4@itcd4 ~]\$' is visible at the bottom with a green cursor.

```
[maxhalbert4@itcd4 ~]$ ./threadHello_step1
Thread 0 returned
Hello from thread -1101236480 with iteration 0
Hello from thread -1111726336 with iteration 0
Hello from thread -1122216192 with iteration 0
Hello from thread -1132706048 with iteration 0
Hello from thread -1143195904 with iteration 0
Hello from thread -1153685760 with iteration 0
Hello from thread -1164175616 with iteration 0
Hello from thread -1090746624 with iteration 0
Hello from thread -1080256768 with iteration 0
Hello from thread -1069766912 with iteration 0
Thread 1 returned
Thread 2 returned
Thread 3 returned
Thread 4 returned
Thread 5 returned
Thread 6 returned
Thread 7 returned
Thread 8 returned
Thread 9 returned
Main thread done.
[maxhalbert4@itcd4 ~]$
```

2. Step 2 (fixed step 1 program)

\$>./threadHelloFixed_step1_Fixed



```
maxhalbert4@itcd4:~$ ./threadHelloFixed_step1_Fixed
Hello from thread 2607064832 with iteration 3
Hello from thread 2596574976 with iteration 4
Hello from thread 2586085120 with iteration 5
Hello from thread 2575595264 with iteration 6
Hello from thread 2565105408 with iteration 7
Hello from thread 2554615552 with iteration 8
Hello from thread 2544125696 with iteration 9
Hello from thread 2617554688 with iteration 2
Hello from thread 2628044544 with iteration 1
Hello from thread 2638534400 with iteration 0
Thread 0 returned
Thread 1 returned
Thread 2 returned
Thread 3 returned
Thread 4 returned
Thread 5 returned
Thread 6 returned
Thread 7 returned
Thread 8 returned
Thread 9 returned
Main thread done.
[maxhalbert4@itcd4 ~]$
```

3. Step 3 Matrix Multiplication using threads

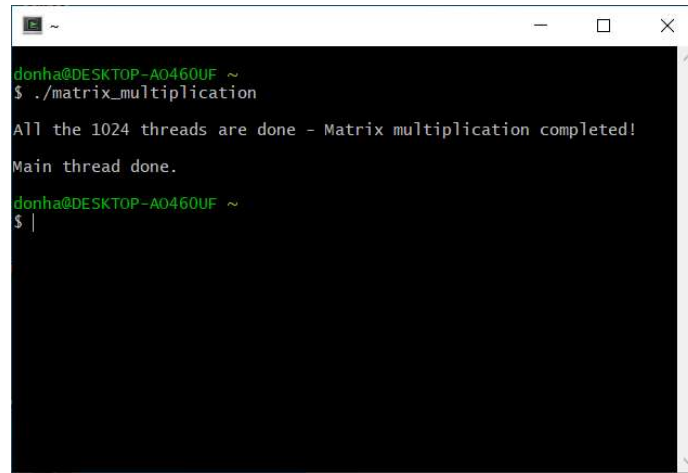
A. Matrix A is 3 x 2, Matrix B is 2 x 4, Matrix C is 3 x 4 with output (testing purpose)

\$> ./matrix_multiplication p

```
donha@DESKTOP-A0460UF ~  
$ ./matrix_multiplication p  
  
All the 3 threads are done - Matrix multiplication completed!  
  
Matrix A  
1819122838      147758478  
819822288       2088682878  
1525113836      1346898195  
  
Matrix B  
930304731      1549450259      450668278      627445567  
1486669944     1668278328      467618520      1365318047  
  
Matrix C  
1912006670675331584      3065142619117580288      888915557671745536      1343137877142211584  
3867866610375663616      4754778235907640320      1346174694958680576      3366110288126696960  
3421213681078709248      4610089096935501312      1317154966760665856      2795870328673789952  
  
Main thread done.  
  
donha@DESKTOP-A0460UF ~  
$ |
```

B. Matrix A, B, C is 1024 x 1024 without printing out the output

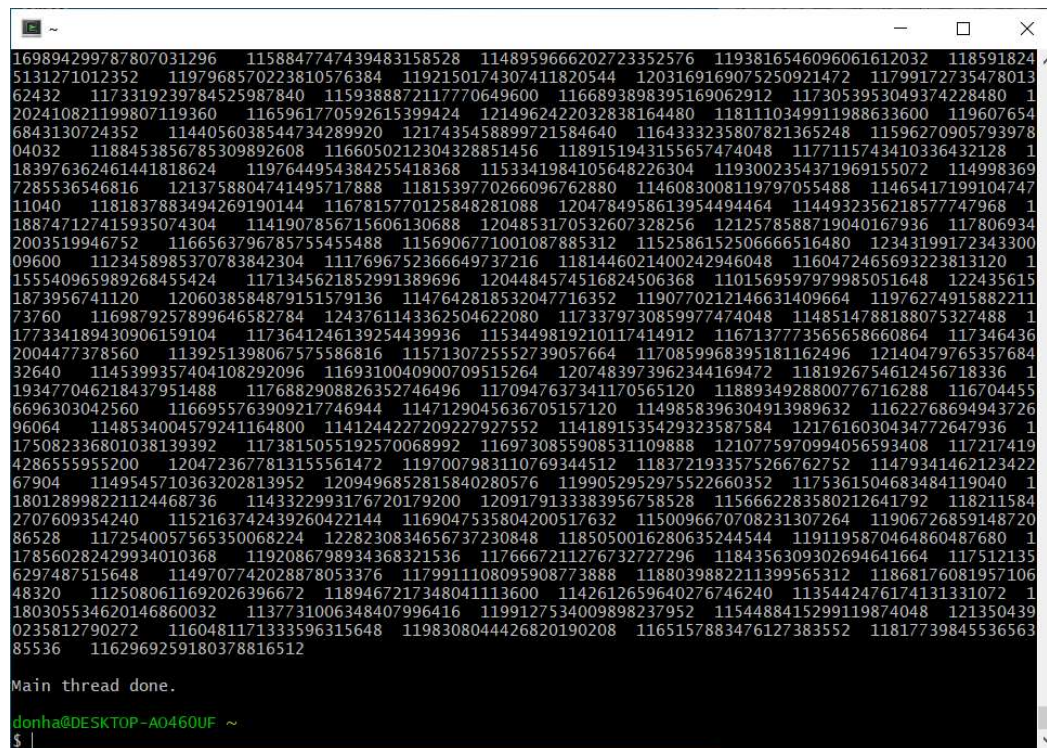
```
$> ./matrix_multiplication
```



```
donha@DESKTOP-A0460UF ~  
$ ./matrix_multiplication  
  
All the 1024 threads are done - Matrix multiplication completed!  
  
Main thread done.  
  
donha@DESKTOP-A0460UF ~  
$ |
```

C. Matrix A, B, C is 1024 x 1024 with output

```
$> ./maxtrix_multiplication p
```



```
16989429978707031296 1158847747439483158528 1148959666202723352576 1193816546096061612032 118591824  
5131271012352 1197968570223810576384 1192150174307411820544 1203169169075250921472 11799172735478013  
62432 1173319239784525987840 1159388872117770649600 1166893898395169062912 1173053953049374228480 1  
202410821199807119360 1165961770592615399424 1214962422032838164480 1181110349911988633600 119607654  
6843130724352 1144056038544734289920 1217435458899721584640 1164333235807821365248 11596270905793978  
04032 1188453856785309892608 1166050212304328851456 1189151943155657474048 1177115743410336432128 1  
183976362461441818624 1197644954384255418368 1153341984105648226304 1193002354371969155072 114998369  
7285536546816 1213758804741495717888 1181539770266096762880 1146083008119797055488 11465417199104747  
11040 1181837883494269190144 1167815770125848281088 1204784958613954494464 1144932356218577747968 1  
188747127415935074304 1141907856715606130688 1204853170532607328256 1212578588719040167936 117806934  
2003519946752 1166563796785755455488 1156906771001087885312 1152586152506666516480 12343199172343300  
09600 1123458985370783842304 1117696752366649737216 1181446021400242946048 1160472465693223813120 1  
155540965989268455424 1171345621852991389696 1204484574516824506368 1101569597979985051648 122435615  
1873956741120 1206038584879151579136 1147642818532047716352 1190770212146631409664 11976274915882211  
73760 1169879257899646582784 1243761143362504622080 1173379730859977474048 1148514788188075327488 1  
177334189430906159104 1173641246139254439936 1153449819210117414912 1167137773565658660864 117346436  
2004477378560 1139251398067575586816 1157130725552739057664 1170859968395181162496 12140479765357684  
32640 1145399357404108292096 1169310040900709515264 1207483973962344169472 1181926754612456718336 1  
193477046218437951488 1176882908826352746496 1170947637341170565120 1188934928800776716288 116704455  
6696303042560 1166955763909217746944 1147129045636705157120 1149858396304913989632 11622768694943726  
96064 1148534004579241164800 1141244227209227927552 1141891535429323587584 1217616030434772647936 1  
175082336801038139392 1173815055192570068992 1169730855908531109888 1210775970994056593408 117217419  
4286555955200 1204723677813155561472 1197007983110769344512 1183721933575266762752 11479341462123422  
67904 1149545710363202813952 1209496852815840280576 1199052952975522660352 1175361504683484119040 1  
180128998221124468736 1143322993176720179200 1209179133383956758528 1156662283580212641792 118211584  
2707609354240 1152163742439260422144 1169047535804200517632 1150096670708231307264 11906726859148720  
86528 1172540057565350068224 1228230834656737230848 1185050016280635244544 1191195870464860487680 1  
178560282429934010368 1192086798934368321536 1176667211276732727296 1184356309302694641664 117512135  
6297487515648 1149707742028878053376 1179911108095908773888 1188039882211399565312 11868176081957106  
48320 1125080611692026396672 118946721734804113600 1142612659640276746240 1135442476174131331072 1  
180305534620146860032 1137731006348407996416 1199127534009898237952 1154488415299119874048 121350439  
0235812790272 1160481171333596315648 1198308044426820190208 1165157883476127383552 11817739845536563  
85536 1162969259180378816512  
  
Main thread done.  
  
donha@DESKTOP-A0460UF ~  
$ |
```