

# Concurrent Dependency Discoverer Report

## Status of implementation

The **dependencyDiscovered.cpp** file compiles with no errors. The compiled **dependencyDiscovered** program returns an identical output to that of the **output**, file found in the test folder, when run from inside the folder using `$ ../dependencyDiscoverer *.y *.l *.c`. Thus the command `$ ../dependencyDiscoverer *.y *.l *.c | diff - output` produces no output as expected.

## Sequential Build

```
-bash-4.2$ pwd
/users/level3/2382904f/systemsae2/systems-ae2-sequential
-bash-4.2$ make
clang++ -Wall -Werror -std=c++17 -o dependencyDiscoverer dependencyDiscoverer.cpp -lpthread
-bash-4.2$
```

## Sequential Runtime

```
-bash-4.2$ pwd
/users/level3/2382904f/systemsae2/systems-ae2-sequential
-bash-4.2$ time ./dependencyDiscoverer -Itest test/*.c test/*.l test/*.y > temp

real    0m0.050s
user    0m0.010s
sys     0m0.014s
-bash-4.2$
```

## 1-Thread Build

```
-bash-4.2$ pwd
/users/level3/2382904f/systemsae2/systems-ae2-1thread
-bash-4.2$ make
clang++ -Wall -Werror -std=c++17 -o dependencyDiscoverer dependencyDiscoverer.cpp -lpthread
-bash-4.2$
```

## 1-Thread Runtime

```
-bash-4.2$ pwd
/users/level3/2382904f/systemsae2/systems-ae2-1thread
-bash-4.2$ time ./dependencyDiscoverer -Itest test/*.c test/*.l test/*.y > temp

real    0m0.033s
user    0m0.009s
sys     0m0.009s
-bash-4.2$
```

## Runtime with Multiple Threads

```

-bash-4.2$ pwd
/users/level3/2382904f/systemsae2/systems-ae2-final
-bash-4.2$ make
clang++ -Wall -Werror -std=c++17 -o dependencyDiscoverer dependencyDiscoverer.cpp -lpthread
-bash-4.2$ export CRAWLER_THREADS=1
-bash-4.2$ time ./dependencyDiscoverer -Itest test/*.c test/*.l test/*.y > temp

real    0m0.060s
user    0m0.011s
sys     0m0.018s
-bash-4.2$ export CRAWLER_THREADS=2
-bash-4.2$ time ./dependencyDiscoverer -Itest test/*.c test/*.l test/*.y > temp

real    0m0.036s
user    0m0.010s
sys     0m0.020s
-bash-4.2$ export CRAWLER_THREADS=3
-bash-4.2$ time ./dependencyDiscoverer -Itest test/*.c test/*.l test/*.y > temp

real    0m0.022s
user    0m0.013s
sys     0m0.013s
-bash-4.2$ export CRAWLER_THREADS=4
-bash-4.2$ time ./dependencyDiscoverer -Itest test/*.c test/*.l test/*.y > temp

real    0m0.020s
user    0m0.007s
sys     0m0.018s
-bash-4.2$ export CRAWLER_THREADS=6
-bash-4.2$ time ./dependencyDiscoverer -Itest test/*.c test/*.l test/*.y > temp

real    0m0.025s
user    0m0.011s
sys     0m0.022s
-bash-4.2$ export CRAWLER_THREADS=8
-bash-4.2$ time ./dependencyDiscoverer -Itest test/*.c test/*.l test/*.y > temp

real    0m0.015s
user    0m0.010s
sys     0m0.018s
-bash-4.2$

```

## Runtime with Multiple Threads Experiment

CRAWLER_	1	2	3	4	6	8
THREADS	Elapsed Time	Elapsed Time	Elapsed Time	Elapsed Time	Elapsed Time	Elapsed Time
Execution 1	0.058	0.036	0.029	0.020	0.016	0.016
Execution 2	0.035	0.026	0.021	0.018	0.017	0.015
Execution 3	0.040	0.025	0.021	0.019	0.025	0.018
Median	0.040	0.026	0.021	0.019	0.017	0.016