

COA

MIDSEM PROJECT

❖ 21CS01003

❖ 21CS01005

❖ 21CS01034

❖ 21CS01041

❖ 21CS01072

Steps followed:

1. Make header file for declaring the variables.

```
#ifndef WARP_STATE_COUNTER
#define WARP_STATE_COUNTER

// Defining custom indexes for the counter array
enum counters { CYCLE, WARP, WAITING, ISSUED, XALU, XMEM, OTHER };

// Counter array size
#define NUM_COUNTERS (OTHER + 1)

// Declaring the counter array
warp_state_counters[TOTAL] +=
m_next_cycle_prioritized_warps.size();
extern unsigned long long warp_state_counters[NUM_COUNTERS];

#endif
```

2. For counting the total warps, implement the below line.(or we can also multiply the total no.of cycles and no.of warps.

```
warp_state_counters[TOTAL] += m_next_cywarp_state_counters[TOTAL] +=
m_next_cycle_prioritized_warps.size();cle_prioritized_warps.size();
```

3. If the warps are done consider them in others.

```
if ((*iter) == NULL || (*iter)->done_exit()) {
    if ((*iter) == NULL)
        warp_state_counters[TOTAL]--;
    else
        warp_state_counters[OTHER]++;
    continue;
}
```

//OTHER STATE

```
if (warp(warp_id).ibuffer_empty()) {
    warp_state_counters[OTHER]++;
    SCHED_DPRINTF(
        "Warp (warp_id %u, dynamic_warp_id %u) fails as ibuffer_empty\n",
        (*iter)->get_warp_id(), (*iter)->get_dynamic_warp_id());
}

else if (warp(warp_id).waiting()) {
```

```
warp_state_counters[OTHER]++;
SCHED_DPRINTF(
    "Warp (warp_id %u, dynamic_warp_id %u) fails as waiting for "
    "barrier\n",
    (*iter)->get_warp_id(), (*iter)->get_dynamic_warp_id());
}
```

4. For XMEM and XALU else statements whenever necessary.
5. If there are any scoreboard collisions(no data dependencies) consider the warp in waiting state.
6. If a warp is issued the remaining warps in the m_next_cycle_priority_warps vector are checked if they are completed(if completed considered in others,if not considered in waiting).
7. Finally,print the values of counter in checkpoint file.

BFS benchmark:

```

minimum = 0.0172973 (at node 0)
maximum = 0.0911351 (at node 15)
Accepted flit rate average= 0.0512513
minimum = 0.0227027 (at node 16)
maximum = 0.0778370 (at node 1)
Injected packet length average = 1
Accepted packet length average = 1
Total in-flight flits = 0 (0 measured)
===== Overall Traffic Statistics =====
===== Traffic class 0 =====
Packet latency average = 28.6696 (20 samples)
minimum = 5 (20 samples)
maximum = 200.1 (20 samples)
Network latency average = 27.0823 (20 samples)
minimum = 5 (20 samples)
maximum = 197.55 (20 samples)
Flit latency average = 27.0821 (20 samples)
minimum = 5 (20 samples)
maximum = 197.55 (20 samples)
Fragmentation average = 1.79866e-05 (20 samples)
minimum = 0 (20 samples)
maximum = 24 (20 samples)
Injected packet rate average = 0.123072 (20 samples)
minimum = 0.0573214 (20 samples)
maximum = 0.305984 (20 samples)
Accepted packet rate average = 0.123072 (20 samples)
minimum = 0.0736709 (20 samples)
maximum = 0.270703 (20 samples)
Injected flit rate average = 0.123072 (20 samples)
minimum = 0.057323 (20 samples)
maximum = 0.305984 (20 samples)
Accepted flit rate average = 0.123072 (20 samples)
minimum = 0.0736744 (20 samples)
maximum = 0.270703 (20 samples)
Injected packet size average = 1.00001 (20 samples)
Accepted packet size average = 1.00001 (20 samples)
Hops average = 1 (20 samples)
-----END-of-Interconnect-DETAILS-----

gpgpu_simulation_time = 0 days, 0 hrs, 16 min, 22 sec (982 sec)
gpgpu_simulation_rate = 31327 (flits/sec)
gpgpu_simulation_rate = 540 (cycles/sec)
gpgpu_silicon_slowdown = 1277372x
Kernel Executed 10 times
Result stored in result.txt
GPU-Sim: *** exit detected ***
ISSUED : 2324006
WAITING : 186189659
XMEM : 103659699
XALU : 247184
OTHERS : 72524548
TOTAL WARPS : 364945056
EXP WARPS : 364945056
kandulajagadeesh@kandulajagadeesh-Aspire-A315-22: ~/gpu-rodinia/cuda/bfs $

```

Hotspot benchmark:

[illegible]

Gaussian benchmark:

[illegible]

Warp stats breakdown:

