

1024 Blocks Results

2k Nodes

```
==7656== NVPROF is profiling process 7656, command: ./zdo3
RUN 1: Number of Vertices = 4000 | Number of Edges = 18135 | ERROR COUNT (BELLMAN FORD): 0

==7656== Profiling application: ./zdo3
==7656== Profiling result:
   Type  Time(%)    Time      Calls      Avg        Min        Max      Name
GPU activities: 100.00% 231.51us    1 231.51us 231.51us 231.51us is_zero_indegree_parallel(node*, int, bool*)
  API calls: 99.39% 205.59ms    2 102.79ms 24.572us 205.56ms cudaMallocManaged
             0.22% 463.73us    3 154.58us 33.129us 324.09us cudaMemcpyPrefetchAsync
             0.11% 234.55us    1 234.55us 234.55us 234.55us cudaDeviceSynchronize
             0.11% 225.96us   101 2.2370us 207ns 83.982us cuDeviceGetAttribute
             0.10% 211.39us    3 70.462us 2.9770us 137.83us cudaFree
             0.02% 44.563us    1 44.563us 44.563us 44.563us cudaLaunchKernel
             0.02% 35.282us    1 35.282us 35.282us 35.282us cuDeviceGetName
             0.02% 35.211us    2 17.605us 3.0070us 32.204us cudaMemcpyAdvise
             0.00% 8.3390us    1 8.3390us 8.3390us 8.3390us cuDeviceGetPCIBusId
             0.00% 3.8260us    1 3.8260us 3.8260us 3.8260us cudaGetDevice
             0.00% 2.5360us    3 845ns 323ns 1.8250us cuDeviceGetCount
             0.00% 1.0240us    2 512ns 323ns 701ns cuDeviceGet
             0.00% 737ns    1 737ns 737ns 737ns cuDeviceTotalMem
             0.00% 662ns    1 662ns 662ns 662ns cuModuleGetLoadingMode
             0.00% 442ns    1 442ns 442ns 442ns cuDeviceGetUuid

==7656== Unified Memory profiling result:
Device "Tesla T4 (0)"
   Count  Avg Size  Min Size  Max Size  Total Size  Total Time  Name
       11 20.000KB 4.0000KB 36.000KB 220.0000KB 47.96700us Host To Device
        1 8.0000KB 8.0000KB 8.0000KB 8.000000KB 2.016000us Device To Host
        1 - - - - - 219.8990us Gpu page fault groups
```

```
==9959== NVPROF is profiling process 9959, command: ./zdo3
RUN 1: Number of Vertices = 2000 | Number of Edges = 8953 | ERROR COUNT (BELLMAN FORD): 0

==9959== Profiling application: ./zdo3
==9959== Profiling result:
   Type  Time(%)    Time      Calls      Avg        Min        Max      Name
GPU activities: 100.00% 185.79us    1 185.79us 185.79us 185.79us is_zero_indegree_parallel(node*, int, bool*)
  API calls: 99.41% 144.57ms    2 72.283ms 13.016us 144.55ms cudaMallocManaged
             0.18% 261.01us    3 87.002us 28.448us 174.02us cudaMemcpyPrefetchAsync
             0.14% 208.70us    3 69.566us 3.3290us 138.30us cudaFree
             0.13% 190.57us    1 190.57us 190.57us 190.57us cudaDeviceSynchronize
             0.08% 121.58us   101 1.2030us 129ns 50.816us cuDeviceGetAttribute
             0.02% 27.107us    1 27.107us 27.107us 27.107us cudaLaunchKernel
             0.02% 26.371us    1 26.371us 26.371us 26.371us cuDeviceGetName
             0.01% 13.470us    2 6.7350us 1.6260us 11.844us cudaMemcpyAdvise
             0.00% 5.7890us    1 5.7890us 5.7890us 5.7890us cuDeviceGetPCIBusId
             0.00% 5.7350us    1 5.7350us 5.7350us 5.7350us cudaGetDevice
             0.00% 1.9360us    3 645ns 208ns 1.4220us cuDeviceGetCount
             0.00% 939ns    2 469ns 311ns 628ns cuDeviceGet
             0.00% 455ns    1 455ns 455ns 455ns cuModuleGetLoadingMode
             0.00% 417ns    1 417ns 417ns 417ns cuDeviceTotalMem
             0.00% 228ns    1 228ns 228ns 228ns cuDeviceGetUuid

==9959== Unified Memory profiling result:
Device "Tesla T4 (0)"
   Count  Avg Size  Min Size  Max Size  Total Size  Total Time  Name
        5 22.399KB 4.0000KB 36.000KB 112.0000KB 22.91200us Host To Device
        1 4.0000KB 4.0000KB 4.0000KB 4.000000KB 1.824000us Device To Host
        1 - - - - - 175.7080us Gpu page fault groups
```

```

==10106== NVPROF is profiling process 10106, command: ./zdo3
RUN 1: Number of Vertices = 2000 | Number of Edges = 8953 | ERROR COUNT (BELLMAN FORD): 0

==10106== Profiling application: ./zdo3
==10106== Profiling result:

```

Type	Time(%)	Time	Calls	Avg	Min	Max	Name
GPU activities:	100.00%	191.71us	1	191.71us	191.71us	191.71us	is_zero_indegree_parallel(node*, int, bool*)
API calls:	99.42%	159.17ms	2	79.587ms	18.236us	159.16ms	cudaMallocManaged
	0.19%	309.28us	3	103.09us	32.567us	208.70us	cudaMemPrefetchAsync
	0.12%	197.43us	1	197.43us	197.43us	197.43us	cudaDeviceSynchronize
	0.12%	197.04us	3	65.681us	2.9950us	126.72us	cudaFree
	0.08%	134.06us	101	1.3270us	155ns	57.321us	cuDeviceGetAttribute
	0.02%	33.855us	1	33.855us	33.855us	33.855us	cuDeviceGetName
	0.02%	32.583us	1	32.583us	32.583us	32.583us	cudaLaunchKernel
	0.01%	14.918us	2	7.4590us	1.5890us	13.329us	cudaMemAdvise
	0.00%	6.7130us	1	6.7130us	6.7130us	6.7130us	cuDeviceGetPCIBusId
	0.00%	3.6760us	1	3.6760us	3.6760us	3.6760us	cudaGetDevice
	0.00%	2.1450us	3	715ns	216ns	1.6080us	cuDeviceGetCount
	0.00%	1.1410us	2	570ns	359ns	782ns	cuDeviceGet
	0.00%	490ns	1	490ns	490ns	490ns	cuModuleGetLoadingMode
	0.00%	480ns	1	480ns	480ns	480ns	cuDeviceTotalMem
	0.00%	276ns	1	276ns	276ns	276ns	cuDeviceGetUuid

```

==10106== Unified Memory profiling result:
Device "Tesla T4 (0)"

```

Count	Avg Size	Min Size	Max Size	Total Size	Total Time	Name
5	22.399KB	4.0000KB	36.000KB	112.0000KB	23.00800us	Host To Device
1	4.0000KB	4.0000KB	4.0000KB	4.000000KB	1.824000us	Device To Host
1	-	-	-	-	181.6920us	Gpu page fault groups

```

==10241== NVPROF is profiling process 10241, command: ./zdo3
RUN 1: Number of Vertices = 2000 | Number of Edges = 8953 | ERROR COUNT (BELLMAN FORD): 0

==10241== Profiling application: ./zdo3
==10241== Profiling result:

```

Type	Time(%)	Time	Calls	Avg	Min	Max	Name
GPU activities:	100.00%	243.26us	1	243.26us	243.26us	243.26us	is_zero_indegree_parallel(node*, int, bool*)
API calls:	99.33%	146.53ms	2	73.265ms	13.295us	146.52ms	cudaMallocManaged
	0.19%	284.80us	3	94.932us	31.302us	186.90us	cudaMemPrefetchAsync
	0.17%	247.92us	1	247.92us	247.92us	247.92us	cudaDeviceSynchronize
	0.17%	244.80us	3	81.599us	5.5120us	170.35us	cudaFree
	0.08%	120.77us	101	1.1950us	135ns	50.982us	cuDeviceGetAttribute
	0.02%	31.944us	1	31.944us	31.944us	31.944us	cudaLaunchKernel
	0.02%	24.440us	1	24.440us	24.440us	24.440us	cuDeviceGetName
	0.01%	15.408us	2	7.7040us	1.4220us	13.986us	cudaMemAdvise
	0.00%	6.4570us	1	6.4570us	6.4570us	6.4570us	cudaGetDevice
	0.00%	5.8140us	1	5.8140us	5.8140us	5.8140us	cuDeviceGetPCIBusId
	0.00%	1.9270us	3	642ns	233ns	1.3980us	cuDeviceGetCount
	0.00%	1.0700us	2	535ns	175ns	895ns	cuDeviceGet
	0.00%	390ns	1	390ns	390ns	390ns	cuModuleGetLoadingMode
	0.00%	353ns	1	353ns	353ns	353ns	cuDeviceTotalMem
	0.00%	196ns	1	196ns	196ns	196ns	cuDeviceGetUuid

```

==10241== Unified Memory profiling result:
Device "Tesla T4 (0)"

```

Count	Avg Size	Min Size	Max Size	Total Size	Total Time	Name
5	22.399KB	4.0000KB	36.000KB	112.0000KB	22.65500us	Host To Device
1	4.0000KB	4.0000KB	4.0000KB	4.000000KB	1.824000us	Device To Host
1	-	-	-	-	233.2430us	Gpu page fault groups

```

==10372== NVPROF is profiling process 10372, command: ./zdo3
RUN 1: Number of Vertices = 2000 | Number of Edges = 8953 | ERROR COUNT (BELLMAN FORD): 0

==10372== Profiling application: ./zdo3
==10372== Profiling result:
   Type  Time(%)   Time     Calls      Avg        Min         Max      Name
GPU activities: 100.00% 220.09us    1 220.09us 220.09us 220.09us is_zero_indegree_parallel(node*, int, bool*)
  API calls: 99.40% 149.19ms    2 74.597ms 13.451us 149.18ms cudaMallocManaged
             0.18% 277.12us    3 92.373us 31.195us 182.78us cudaMemcpyPrefetchAsync
             0.15% 225.78us    1 225.78us 225.78us 225.78us cudaDeviceSynchronize
             0.13% 199.47us    3 66.490us 2.7270us 135.99us cudaFree
             0.08% 120.29us   101 1.1900us   132ns 50.998us cuDeviceGetAttribute
             0.02% 26.697us    1 26.697us 26.697us 26.697us cudaLaunchKernel
             0.02% 23.237us    1 23.237us 23.237us 23.237us cuDeviceGetName
             0.01% 17.424us    2 8.7120us 1.5260us 15.898us cudaMemAdvise
             0.00% 7.1050us    1 7.1050us 7.1050us 7.1050us cudaGetDevice
             0.00% 5.4480us    1 5.4480us 5.4480us 5.4480us cuDeviceGetPCIBusId
             0.00% 2.0620us    3 687ns   232ns 1.5390us cuDeviceGetCount
             0.00% 789ns     2 394ns   155ns 634ns  cuDeviceGet
             0.00% 653ns     1 653ns   653ns 653ns  cuModuleGetLoadingMode
             0.00% 415ns     1 415ns   415ns 415ns  cuDeviceTotalMem
             0.00% 223ns     1 223ns   223ns 223ns  cuDeviceGetUuid

==10372== Unified Memory profiling result:
Device "Tesla T4 (0)"
   Count  Avg Size  Min Size  Max Size  Total Size  Total Time  Name
        5 22.399KB 4.0000KB 36.000KB 112.0000KB 23.45600us Host To Device
        1 4.0000KB 4.0000KB 4.0000KB 4.00000KB 1.824000us Device To Host
        1 - - - - 210.0120us Gpu page fault groups

```

4k Nodes

```

==10684== NVPROF is profiling process 10684, command: ./zdo3
RUN 1: Number of Vertices = 4000 | Number of Edges = 18135 | ERROR COUNT (BELLMAN FORD): 0

==10684== Profiling application: ./zdo3
==10684== Profiling result:
   Type  Time(%)   Time     Calls      Avg        Min         Max      Name
GPU activities: 100.00% 248.54us    1 248.54us 248.54us 248.54us is_zero_indegree_parallel(node*, int, bool*)
  API calls: 99.33% 145.93ms    2 72.967ms 13.146us 145.92ms cudaMallocManaged
             0.19% 278.85us    3 92.949us 30.593us 185.60us cudaMemcpyPrefetchAsync
             0.17% 254.08us    1 254.08us 254.08us 254.08us cudaDeviceSynchronize
             0.15% 220.44us    3 73.479us 2.8630us 150.13us cudaFree
             0.10% 148.90us   101 1.4740us   128ns 78.901us cuDeviceGetAttribute
             0.02% 27.429us    1 27.429us 27.429us 27.429us cudaLaunchKernel
             0.02% 24.140us    1 24.140us 24.140us 24.140us cuDeviceGetName
             0.01% 9.8090us    2 4.9040us 1.3940us 8.4150us cudaMemAdvise
             0.00% 6.0490us    1 6.0490us 6.0490us 6.0490us cuDeviceGetPCIBusId
             0.00% 3.2840us    1 3.2840us 3.2840us 3.2840us cudaGetDevice
             0.00% 2.0590us    3 686ns   227ns 1.5760us cuDeviceGetCount
             0.00% 878ns     2 439ns   170ns 708ns  cuDeviceGet
             0.00% 550ns     1 550ns   550ns 550ns  cuModuleGetLoadingMode
             0.00% 461ns     1 461ns   461ns 461ns  cuDeviceTotalMem
             0.00% 238ns     1 238ns   238ns 238ns  cuDeviceGetUuid

==10684== Unified Memory profiling result:
Device "Tesla T4 (0)"
   Count  Avg Size  Min Size  Max Size  Total Size  Total Time  Name
       11 20.000KB 4.0000KB 36.000KB 220.0000KB 47.29600us Host To Device
        1 8.0000KB 8.0000KB 8.0000KB 8.00000KB 2.016000us Device To Host
        1 - - - - 236.9860us Gpu page fault groups

```

```

==11044== NVPROF is profiling process 11044, command: ./zdo3
RUN 1: Number of Vertices = 4000 | Number of Edges = 18135 | ERROR COUNT (BELLMAN FORD): 0

==11044== Profiling application: ./zdo3
==11044== Profiling result:

```

Type	Time(%)	Time	Calls	Avg	Min	Max	Name
GPU activities:	100.00%	214.36us	1	214.36us	214.36us	214.36us	is_zero_indegree_parallel(node*, int, bool*)
API calls:	99.35%	149.93ms	2	74.966ms	15.601us	149.92ms	cudaMallocManaged
	0.21%	322.60us	3	107.53us	30.126us	192.17us	cudaMemPrefetchAsync
	0.15%	220.77us	1	220.77us	220.77us	220.77us	cudaDeviceSynchronize
	0.15%	219.08us	3	73.025us	2.9400us	146.16us	cudaFree
	0.08%	126.46us	101	1.2520us	140ns	53.248us	cuDeviceGetAttribute
	0.02%	29.051us	1	29.051us	29.051us	29.051us	cuDeviceGetName
	0.02%	27.439us	1	27.439us	27.439us	27.439us	cudaLaunchKernel
	0.01%	11.181us	2	5.5900us	1.5390us	9.6420us	cudaMemAdvise
	0.01%	9.6680us	1	9.6680us	9.6680us	9.6680us	cudaGetDevice
	0.00%	7.0460us	1	7.0460us	7.0460us	7.0460us	cuDeviceGetPCIBusId
	0.00%	2.6790us	2	1.3390us	281ns	2.3980us	cuDeviceGet
	0.00%	1.7220us	3	574ns	186ns	1.2330us	cuDeviceGetCount
	0.00%	434ns	1	434ns	434ns	434ns	cuDeviceTotalMem
	0.00%	412ns	1	412ns	412ns	412ns	cuModuleGetLoadingMode
	0.00%	228ns	1	228ns	228ns	228ns	cuDeviceGetUuid

```

==11044== Unified Memory profiling result:
Device "Tesla T4 (0)"

```

Count	Avg Size	Min Size	Max Size	Total Size	Total Time	Name
11	20.000KB	4.0000KB	36.000KB	220.0000KB	50.46200us	Host To Device
1	8.0000KB	8.0000KB	8.0000KB	8.000000KB	2.016000us	Device To Host
1	-	-	-	-	203.0030us	Gpu page fault groups

```

==11231== NVPROF is profiling process 11231, command: ./zdo3
RUN 1: Number of Vertices = 4000 | Number of Edges = 18135 | ERROR COUNT (BELLMAN FORD): 0

==11231== Profiling application: ./zdo3
==11231== Profiling result:

```

Type	Time(%)	Time	Calls	Avg	Min	Max	Name
GPU activities:	100.00%	292.89us	1	292.89us	292.89us	292.89us	is_zero_indegree_parallel(node*, int, bool*)
API calls:	99.28%	143.59ms	2	71.793ms	34.667us	143.55ms	cudaMallocManaged
	0.23%	335.27us	3	111.76us	27.961us	197.20us	cudaMemPrefetchAsync
	0.21%	304.28us	1	304.28us	304.28us	304.28us	cudaDeviceSynchronize
	0.14%	196.03us	3	65.344us	3.1290us	123.07us	cudaFree
	0.08%	119.25us	101	1.1800us	129ns	50.171us	cuDeviceGetAttribute
	0.02%	31.690us	1	31.690us	31.690us	31.690us	cudaLaunchKernel
	0.02%	22.964us	1	22.964us	22.964us	22.964us	cuDeviceGetName
	0.01%	14.489us	2	7.2440us	2.2510us	12.238us	cudaMemAdvise
	0.00%	6.1420us	1	6.1420us	6.1420us	6.1420us	cuDeviceGetPCIBusId
	0.00%	3.6080us	1	3.6080us	3.6080us	3.6080us	cudaGetDevice
	0.00%	2.5760us	2	1.2880us	182ns	2.3940us	cuDeviceGet
	0.00%	1.9510us	3	650ns	215ns	1.4620us	cuDeviceGetCount
	0.00%	620ns	1	620ns	620ns	620ns	cuModuleGetLoadingMode
	0.00%	395ns	1	395ns	395ns	395ns	cuDeviceTotalMem
	0.00%	243ns	1	243ns	243ns	243ns	cuDeviceGetUuid

```

==11231== Unified Memory profiling result:
Device "Tesla T4 (0)"

```

Count	Avg Size	Min Size	Max Size	Total Size	Total Time	Name
11	20.000KB	4.0000KB	36.000KB	220.0000KB	48.41500us	Host To Device
1	8.0000KB	8.0000KB	8.0000KB	8.000000KB	2.016000us	Device To Host
1	-	-	-	-	281.5610us	Gpu page fault groups

```

==11408== NVPROF is profiling process 11408, command: ./zdo3
RUN 1: Number of Vertices = 4000 | Number of Edges = 18135 | ERROR COUNT (BELLMAN FORD): 0

==11408== Profiling application: ./zdo3
==11408== Profiling result:

```

Type	Time(%)	Time	Calls	Avg	Min	Max	Name
GPU activities:	100.00%	228.57us	1	228.57us	228.57us	228.57us	is_zero_indegree_parallel(node*, int, bool*)
API calls:	99.29%	146.77ms	2	73.385ms	13.547us	146.76ms	cudaMallocManaged
	0.22%	332.49us	3	110.83us	47.751us	185.06us	cudaMemPrefetchAsync
	0.16%	233.88us	1	233.88us	233.88us	233.88us	cudaDeviceSynchronize
	0.15%	222.59us	3	74.196us	3.0660us	150.86us	cudaFree
	0.11%	159.78us	101	1.5810us	135ns	84.186us	cuDeviceGetAttribute
	0.02%	29.462us	1	29.462us	29.462us	29.462us	cuDeviceGetName
	0.02%	28.897us	1	28.897us	28.897us	28.897us	cudaLaunchKernel
	0.02%	22.371us	2	11.185us	1.7680us	20.603us	cudaMemAdvise
	0.00%	7.2810us	1	7.2810us	7.2810us	7.2810us	cudaGetDevice
	0.00%	5.7220us	1	5.7220us	5.7220us	5.7220us	cuDeviceGetPCIBusId
	0.00%	2.6100us	2	1.3050us	274ns	2.3360us	cuDeviceGet
	0.00%	2.0870us	3	695ns	239ns	1.4900us	cuDeviceGetCount
	0.00%	551ns	1	551ns	551ns	551ns	cuModuleGetLoadingMode
	0.00%	499ns	1	499ns	499ns	499ns	cuDeviceTotalMem
	0.00%	248ns	1	248ns	248ns	248ns	cuDeviceGetUuid

```

==11408== Unified Memory profiling result:
Device "Tesla T4 (0)"

```

Count	Avg Size	Min Size	Max Size	Total Size	Total Time	Name
11	20.000KB	4.0000KB	36.000KB	220.0000KB	47.71100us	Host To Device
1	8.0000KB	8.0000KB	8.0000KB	8.000000KB	2.015000us	Device To Host
1	-	-	-	-	216.9550us	Gpu page fault groups

```

==12037== NVPROF is profiling process 12037, command: ./zdo3
RUN 1: Number of Vertices = 4000 | Number of Edges = 18135 | ERROR COUNT (BELLMAN FORD): 0

==12037== Profiling application: ./zdo3
==12037== Profiling result:

```

Type	Time(%)	Time	Calls	Avg	Min	Max	Name
GPU activities:	100.00%	256.89us	1	256.89us	256.89us	256.89us	is_zero_indegree_parallel(node*, int, bool*)
API calls:	99.29%	149.06ms	2	74.531ms	14.956us	149.05ms	cudaMallocManaged
	0.23%	343.31us	3	114.44us	33.389us	213.21us	cudaMemPrefetchAsync
	0.17%	262.56us	1	262.56us	262.56us	262.56us	cudaDeviceSynchronize
	0.14%	216.26us	3	72.086us	3.0500us	145.84us	cudaFree
	0.10%	148.29us	101	1.4680us	129ns	64.516us	cuDeviceGetAttribute
	0.02%	33.574us	1	33.574us	33.574us	33.574us	cudaLaunchKernel
	0.02%	27.198us	1	27.198us	27.198us	27.198us	cuDeviceGetName
	0.01%	14.120us	2	7.0600us	1.4400us	12.680us	cudaMemAdvise
	0.01%	7.5980us	1	7.5980us	7.5980us	7.5980us	cudaGetDevice
	0.00%	5.9310us	1	5.9310us	5.9310us	5.9310us	cuDeviceGetPCIBusId
	0.00%	1.7020us	3	567ns	232ns	1.1500us	cuDeviceGetCount
	0.00%	993ns	2	496ns	291ns	702ns	cuDeviceGet
	0.00%	460ns	1	460ns	460ns	460ns	cuDeviceTotalMem
	0.00%	390ns	1	390ns	390ns	390ns	cuModuleGetLoadingMode
	0.00%	221ns	1	221ns	221ns	221ns	cuDeviceGetUuid

```

==12037== Unified Memory profiling result:
Device "Tesla T4 (0)"

```

Count	Avg Size	Min Size	Max Size	Total Size	Total Time	Name
11	20.000KB	4.0000KB	36.000KB	220.0000KB	47.55100us	Host To Device
1	8.0000KB	8.0000KB	8.0000KB	8.000000KB	1.984000us	Device To Host
1	-	-	-	-	245.3070us	Gpu page fault groups

6k Nodes

```
==2652== NVPROF is profiling process 2652, command: ./zdo3
RUN 1: Number of Vertices = 6000 | Number of Edges = 26718 | ERROR COUNT (BELLMAN FORD): 0

==2652== Profiling application: ./zdo3
==2652== Profiling result:
   Type  Time(%)   Time     Calls    Avg       Min       Max  Name
GPU activities: 100.00% 290.07us      1 290.07us 290.07us 290.07us is_zero_indegree_parallel(node*, int, bool*)
  API calls:   99.40% 381.81ms      2 190.91ms 17.412us 381.80ms cudaMallocManaged
              0.30% 1.1494ms      1 1.1494ms 1.1494ms 1.1494ms cuDeviceGetPCIBusId
              0.10% 389.30us      3 129.77us 29.056us 221.51us cudaMemPrefetchAsync
              0.08% 315.61us      1 315.61us 315.61us 315.61us cudaDeviceSynchronize
              0.07% 251.94us      3 83.981us 3.3870us 155.21us cudaFree
              0.03% 125.19us     101 1.2390us   132ns 51.225us cuDeviceGetAttribute
              0.01% 30.591us      1 30.591us 30.591us 30.591us cudaLaunchKernel
              0.01% 23.433us      1 23.433us 23.433us 23.433us cuDeviceGetName
              0.00% 17.322us      2 8.6610us 2.5610us 14.761us cudaMemAdvise
              0.00% 6.7940us      1 6.7940us 6.7940us 6.7940us cudaGetDevice
              0.00% 1.5840us      3 528ns    213ns 1.1510us cuDeviceGetCount
              0.00% 888ns       2 444ns    183ns 705ns    cuDeviceGet
              0.00% 590ns       1 590ns    590ns 590ns    cuModuleGetLoadingMode
              0.00% 510ns       1 510ns    510ns 510ns    cuDeviceTotalMem
              0.00% 218ns       1 218ns    218ns 218ns    cuDeviceGetUuid

==2652== Unified Memory profiling result:
Device "Tesla T4 (0)"
   Count  Avg Size  Min Size  Max Size  Total Size  Total Time  Name
      13  25.538KB  4.0000KB  48.000KB  332.0000KB  66.20600us  Host To Device
       1   8.0000KB  8.0000KB  8.0000KB  8.000000KB  2.047000us  Device To Host
       1      -      -      -      -      277.7860us  Gpu page fault groups
```

```
==2917== NVPROF is profiling process 2917, command: ./zdo3
RUN 1: Number of Vertices = 6000 | Number of Edges = 26718 | ERROR COUNT (BELLMAN FORD): 0

==2917== Profiling application: ./zdo3
==2917== Profiling result:
   Type  Time(%)   Time     Calls    Avg       Min       Max  Name
GPU activities: 100.00% 337.14us      1 337.14us 337.14us 337.14us is_zero_indegree_parallel(node*, int, bool*)
  API calls:   99.54% 248.56ms      2 124.28ms 17.342us 248.54ms cudaMallocManaged
              0.15% 383.79us      3 127.93us 31.315us 208.97us cudaMemPrefetchAsync
              0.14% 343.38us      1 343.38us 343.38us 343.38us cudaDeviceSynchronize
              0.09% 217.93us      3 72.644us 2.7540us 143.01us cudaFree
              0.05% 122.03us     101 1.2080us   132ns 51.235us cuDeviceGetAttribute
              0.01% 32.103us      1 32.103us 32.103us 32.103us cudaLaunchKernel
              0.01% 24.513us      1 24.513us 24.513us 24.513us cuDeviceGetName
              0.00% 11.949us      2 5.9740us 2.3050us 9.6440us cudaMemAdvise
              0.00% 5.6720us      1 5.6720us 5.6720us 5.6720us cuDeviceGetPCIBusId
              0.00% 3.4910us      1 3.4910us 3.4910us 3.4910us cudaGetDevice
              0.00% 1.7420us      3 580ns    214ns 1.2810us cuDeviceGetCount
              0.00% 629ns       2 314ns    179ns 450ns    cuDeviceGet
              0.00% 570ns       1 570ns    570ns 570ns    cuModuleGetLoadingMode
              0.00% 428ns       1 428ns    428ns 428ns    cuDeviceTotalMem
              0.00% 222ns       1 222ns    222ns 222ns    cuDeviceGetUuid

==2917== Unified Memory profiling result:
Device "Tesla T4 (0)"
   Count  Avg Size  Min Size  Max Size  Total Size  Total Time  Name
      13  25.538KB  4.0000KB  48.000KB  332.0000KB  67.00700us  Host To Device
       1   8.0000KB  8.0000KB  8.0000KB  8.000000KB  2.048000us  Device To Host
       1      -      -      -      -      326.1690us  Gpu page fault groups
```

```

==3256== NVPROF is profiling process 3256, command: ./zdo3
RUN 1: Number of Vertices = 6000 | Number of Edges = 26718 | ERROR COUNT (BELLMAN FORD): 0

==3256== Profiling application: ./zdo3
==3256== Profiling result:
      Type  Time(%)   Time    Calls      Avg      Min      Max  Name
GPU activities: 100.00% 321.75us    1 321.75us 321.75us 321.75us is_zero_indegree_parallel(node*, int, bool*)
  API calls: 99.52% 245.63ms    2 122.81ms 35.992us 245.59ms cudaMallocManaged
              0.15% 366.55us    3 122.18us 34.455us 199.71us cudaMemPrefetchAsync
              0.13% 329.75us    1 329.75us 329.75us 329.75us cudaDeviceSynchronize
              0.10% 239.65us    3 79.883us 2.4210us 150.96us cudaFree
              0.06% 150.03us   101 1.4850us 139ns 60.241us cuDeviceGetAttribute
              0.01% 36.937us    1 36.937us 36.937us 36.937us cudaLaunchKernel
              0.01% 36.329us    1 36.329us 36.329us 36.329us cuDeviceGetName
              0.01% 13.201us    2 6.6000us 2.2980us 10.903us cudaMemAdvise
              0.00% 6.6220us    1 6.6220us 6.6220us 6.6220us cuDeviceGetPCIBusId
              0.00% 3.9600us    1 3.9600us 3.9600us 3.9600us cudaGetDevice
              0.00% 1.6280us    3 542ns 182ns 1.1840us cuDeviceGetCount
              0.00% 872ns     2 436ns 181ns 691ns cuDeviceGet
              0.00% 647ns     1 647ns 647ns 647ns cuDeviceTotalMem
              0.00% 530ns     1 530ns 530ns 530ns cuModuleGetLoadingMode
              0.00% 236ns     1 236ns 236ns 236ns cuDeviceGetUuid

==3256== Unified Memory profiling result:
Device "Tesla T4 (0)"
  Count  Avg Size  Min Size  Max Size  Total Size  Total Time  Name
    13  25.538KB  4.0000KB  48.000KB  332.0000KB  66.36700us  Host To Device
     1   8.0000KB  8.0000KB  8.0000KB  8.000000KB  2.048000us  Device To Host
     1      -      -      -      -      309.4970us  Gpu page fault groups

```

```

==3761== NVPROF is profiling process 3761, command: ./zdo3
RUN 1: Number of Vertices = 6000 | Number of Edges = 26718 | ERROR COUNT (BELLMAN FORD): 0

==3761== Profiling application: ./zdo3
==3761== Profiling result:
      Type  Time(%)   Time    Calls      Avg      Min      Max  Name
GPU activities: 100.00% 310.27us    1 310.27us 310.27us 310.27us is_zero_indegree_parallel(node*, int, bool*)
  API calls: 99.56% 259.98ms    2 129.99ms 16.074us 259.96ms cudaMallocManaged
              0.13% 335.19us    1 335.19us 335.19us 335.19us cudaDeviceSynchronize
              0.13% 329.92us    3 109.97us 27.522us 184.35us cudaMemPrefetchAsync
              0.09% 225.05us    3 75.016us 2.9260us 141.35us cudaFree
              0.06% 157.11us   101 1.5550us 141ns 77.436us cuDeviceGetAttribute
              0.01% 31.878us    1 31.878us 31.878us 31.878us cudaLaunchKernel
              0.01% 28.264us    1 28.264us 28.264us 28.264us cuDeviceGetName
              0.01% 14.914us    2 7.4570us 1.5570us 13.357us cudaMemAdvise
              0.00% 7.2800us    1 7.2800us 7.2800us 7.2800us cudaGetDevice
              0.00% 5.4390us    1 5.4390us 5.4390us 5.4390us cuDeviceGetPCIBusId
              0.00% 2.6600us    2 1.3300us 279ns 2.3810us cuDeviceGet
              0.00% 1.6950us    3 565ns 214ns 1.1610us cuDeviceGetCount
              0.00% 618ns     1 618ns 618ns 618ns cuDeviceTotalMem
              0.00% 425ns     1 425ns 425ns 425ns cuModuleGetLoadingMode
              0.00% 253ns     1 253ns 253ns 253ns cuDeviceGetUuid

==3761== Unified Memory profiling result:
Device "Tesla T4 (0)"
  Count  Avg Size  Min Size  Max Size  Total Size  Total Time  Name
    13  25.538KB  4.0000KB  48.000KB  332.0000KB  66.97400us  Host To Device
     1   8.0000KB  8.0000KB  8.0000KB  8.000000KB  2.048000us  Device To Host
     1      -      -      -      -      299.2570us  Gpu page fault groups

```

```

==3976== NVPROF is profiling process 3976, command: ./zdo3
RUN 1: Number of Vertices = 6000 | Number of Edges = 26718 | ERROR COUNT (BELLMAN FORD): 0

==3976== Profiling application: ./zdo3
==3976== Profiling result:
      Type  Time(%)   Time     Calls       Avg        Min        Max   Name
GPU activities: 100.00% 339.38us    1 339.38us 339.38us 339.38us is_zero_indegree_parallel(node*, int, bool*)
  API calls: 99.52% 258.01ms    2 129.00ms 23.238us 257.99ms cudaMallocManaged
              0.15% 401.05us    3 133.68us 48.080us 221.48us cudaMemPrefetchAsync
              0.13% 345.05us    1 345.05us 345.05us 345.05us cudaDeviceSynchronize
              0.09% 236.25us    3 78.750us 3.6120us 156.78us cudaFree
              0.06% 155.95us   101 1.5440us   148ns 63.546us cuDeviceGetAttribute
              0.02% 39.948us    1 39.948us 39.948us 39.948us cudaLaunchKernel
              0.01% 24.409us    1 24.409us 24.409us 24.409us cuDeviceGetName
              0.01% 15.481us    2 7.7400us 2.0550us 13.426us cudaMemAdvise
              0.00% 6.3700us    1 6.3700us 6.3700us 6.3700us cuDeviceGetPCIBusId
              0.00% 3.2460us    1 3.2460us 3.2460us 3.2460us cudaGetDevice
              0.00% 2.2120us    3 737ns    200ns 1.7220us cuDeviceGetCount
              0.00% 1.0430us    2 521ns    192ns 851ns   cuDeviceGet
              0.00% 559ns     1 559ns    559ns 559ns   cuModuleGetLoadingMode
              0.00% 526ns     1 526ns    526ns 526ns   cuDeviceTotalMem
              0.00% 275ns     1 275ns    275ns 275ns   cuDeviceGetUuid

==3976== Unified Memory profiling result:
Device "Tesla T4 (0)"
  Count  Avg Size  Min Size  Max Size  Total Size  Total Time  Name
    13  25.538KB  4.0000KB  48.000KB  332.0000KB  66.23700us  Host To Device
     1  8.0000KB  8.0000KB  8.0000KB  8.000000KB  2.048000us  Device To Host
     1      -      -      -      -      328.2160us  Gpu page fault groups

```

8k Nodes

```

==4370== NVPROF is profiling process 4370, command: ./zdo3
RUN 1: Number of Vertices = 8000 | Number of Edges = 35925 | ERROR COUNT (BELLMAN FORD): 0

==4370== Profiling application: ./zdo3
==4370== Profiling result:
      Type  Time(%)   Time     Calls       Avg        Min        Max   Name
GPU activities: 100.00% 338.87us    1 338.87us 338.87us 338.87us is_zero_indegree_parallel(node*, int, bool*)
  API calls: 99.51% 248.08ms    2 124.04ms 19.407us 248.06ms cudaMallocManaged
              0.15% 377.65us    3 125.88us 35.415us 188.48us cudaMemPrefetchAsync
              0.14% 343.65us    1 343.65us 343.65us 343.65us cudaDeviceSynchronize
              0.10% 240.28us    3 80.094us 2.4110us 138.77us cudaFree
              0.05% 127.11us   101 1.2580us   127ns 51.427us cuDeviceGetAttribute
              0.03% 72.117us    1 72.117us 72.117us 72.117us cudaLaunchKernel
              0.01% 24.397us    1 24.397us 24.397us 24.397us cuDeviceGetName
              0.01% 15.028us    2 7.5140us 1.7410us 13.287us cudaMemAdvise
              0.00% 5.6530us    1 5.6530us 5.6530us 5.6530us cuDeviceGetPCIBusId
              0.00% 2.7690us    1 2.7690us 2.7690us 2.7690us cudaGetDevice
              0.00% 2.0620us    3 687ns    225ns 1.5890us cuDeviceGetCount
              0.00% 1.2190us    2 609ns    189ns 1.0300us cuDeviceGet
              0.00% 536ns     1 536ns    536ns 536ns   cuModuleGetLoadingMode
              0.00% 384ns     1 384ns    384ns 384ns   cuDeviceTotalMem
              0.00% 209ns     1 209ns    209ns 209ns   cuDeviceGetUuid

==4370== Unified Memory profiling result:
Device "Tesla T4 (0)"
  Count  Avg Size  Min Size  Max Size  Total Size  Total Time  Name
    23  19.130KB  4.0000KB  48.000KB  440.0000KB  99.55000us  Host To Device
     1  12.000KB  12.000KB  12.000KB  12.000000KB  2.368000us  Device To Host
     1      -      -      -      -      325.5610us  Gpu page fault groups

```



```

==5091== NVPROF is profiling process 5091, command: ./zdo3
RUN 1: Number of Vertices = 8000 | Number of Edges = 35925 | ERROR COUNT (BELLMAN FORD): 0

==5091== Profiling application: ./zdo3
==5091== Profiling result:
   Type  Time(%)   Time    Calls    Avg      Min      Max  Name
GPU activities: 100.00% 375.48us    1 375.48us 375.48us 375.48us is_zero_indegree_parallel(node*, int, bool*)
  API calls: 99.50% 242.59ms    2 121.30ms 17.826us 242.58ms cudaMallocManaged
              0.16% 381.96us    1 381.96us 381.96us 381.96us cudaDeviceSynchronize
              0.16% 380.75us    3 126.92us 31.460us 195.47us cudaMemPrefetchAsync
              0.10% 237.95us    3 79.316us 3.1080us 149.25us cudaFree
              0.05% 125.26us   101 1.2400us 132ns 52.738us cuDeviceGetAttribute
              0.01% 35.243us    1 35.243us 35.243us 35.243us cudaLaunchKernel
              0.01% 28.712us    1 28.712us 28.712us 28.712us cuDeviceGetName
              0.01% 17.830us    2 8.9150us 2.2010us 15.629us cudaMemAdvise
              0.00% 7.1210us    1 7.1210us 7.1210us 7.1210us cuDeviceGetPCIBusId
              0.00% 4.4340us    1 4.4340us 4.4340us 4.4340us cudaGetDevice
              0.00% 2.1000us    3 700ns 200ns 1.5550us cuDeviceGetCount
              0.00% 940ns     2 470ns 267ns 673ns cuDeviceGet
              0.00% 460ns     1 460ns 460ns 460ns cuModuleGetLoadingMode
              0.00% 411ns     1 411ns 411ns 411ns cuDeviceTotalMem
              0.00% 245ns     1 245ns 245ns 245ns cuDeviceGetUuid

==5091== Unified Memory profiling result:
Device "Tesla T4 (0)"
  Count  Avg Size  Min Size  Max Size  Total Size  Total Time  Name
    23  19.130KB  4.0000KB  48.000KB  440.0000KB  98.87800us  Host To Device
     1  12.000KB  12.000KB  12.000KB  12.00000KB  2.368000us  Device To Host
     1  -        -        -        -        362.3590us  Gpu page fault groups

```

```

==5368== NVPROF is profiling process 5368, command: ./zdo3
RUN 1: Number of Vertices = 8000 | Number of Edges = 35925 | ERROR COUNT (BELLMAN FORD): 0

==5368== Profiling application: ./zdo3
==5368== Profiling result:
   Type  Time(%)   Time    Calls    Avg      Min      Max  Name
GPU activities: 100.00% 320.18us    1 320.18us 320.18us 320.18us is_zero_indegree_parallel(node*, int, bool*)
  API calls: 99.54% 251.79ms    2 125.90ms 13.588us 251.78ms cudaMallocManaged
              0.15% 368.77us    3 122.92us 30.546us 187.20us cudaMemPrefetchAsync
              0.14% 346.08us    1 346.08us 346.08us 346.08us cudaDeviceSynchronize
              0.09% 229.75us    3 76.583us 3.0050us 149.98us cudaFree
              0.05% 123.31us   101 1.2200us 131ns 52.012us cuDeviceGetAttribute
              0.02% 38.597us    1 38.597us 38.597us 38.597us cudaLaunchKernel
              0.01% 25.758us    1 25.758us 25.758us 25.758us cuDeviceGetName
              0.01% 15.979us    2 7.9890us 1.7260us 14.253us cudaMemAdvise
              0.00% 9.2120us    1 9.2120us 9.2120us 9.2120us cuDeviceGetPCIBusId
              0.00% 6.6180us    1 6.6180us 6.6180us 6.6180us cudaGetDevice
              0.00% 2.6660us    3 888ns 206ns 2.1610us cuDeviceGetCount
              0.00% 970ns     2 485ns 189ns 781ns cuDeviceGet
              0.00% 633ns     1 633ns 633ns 633ns cuModuleGetLoadingMode
              0.00% 511ns     1 511ns 511ns 511ns cuDeviceTotalMem
              0.00% 233ns     1 233ns 233ns 233ns cuDeviceGetUuid

==5368== Unified Memory profiling result:
Device "Tesla T4 (0)"
  Count  Avg Size  Min Size  Max Size  Total Size  Total Time  Name
    23  19.130KB  4.0000KB  48.000KB  440.0000KB  101.8860us  Host To Device
     1  12.000KB  12.000KB  12.000KB  12.00000KB  2.400000us  Device To Host
     1  -        -        -        -        306.9040us  Gpu page fault groups

```

```

==5725== NVPROF is profiling process 5725, command: ./zdo3
RUN 1: Number of Vertices = 8000 | Number of Edges = 35925 | ERROR COUNT (BELLMAN FORD): 0

==5725== Profiling application: ./zdo3
==5725== Profiling result:
   Type  Time(%)   Time     Calls      Avg        Min         Max   Name
GPU activities: 100.00% 350.39us    1 350.39us 350.39us 350.39us is_zero_indegree_parallel(node*, int, bool*)
  API calls: 99.49% 239.87ms    2 119.94ms 15.792us 239.86ms cudaMallocManaged
             0.17% 405.05us    3 135.02us 47.270us 186.37us cudaMemPrefetchAsync
             0.15% 361.35us    1 361.35us 361.35us 361.35us cudaDeviceSynchronize
             0.10% 241.91us    3 80.636us 4.6790us 158.90us cudaFree
             0.05% 129.72us   101 1.2840us 134ns 51.132us cuDeviceGetAttribute
             0.01% 30.223us    1 30.223us 30.223us 30.223us cudaLaunchKernel
             0.01% 26.267us    1 26.267us 26.267us 26.267us cuDeviceGetName
             0.01% 16.761us    2 8.3800us 2.6840us 14.077us cudaMemAdvise
             0.00% 7.4530us    1 7.4530us 7.4530us 7.4530us cudaGetDevice
             0.00% 6.1360us    1 6.1360us 6.1360us 6.1360us cuDeviceGetPCIBusId
             0.00% 2.6880us    2 1.3440us 275ns 2.4130us cuDeviceGet
             0.00% 2.1810us    3 727ns 237ns 1.6300us cuDeviceGetCount
             0.00% 485ns      1 485ns 485ns 485ns cuDeviceTotalMem
             0.00% 444ns      1 444ns 444ns 444ns cuModuleGetLoadingMode
             0.00% 229ns      1 229ns 229ns 229ns cuDeviceGetUuid

==5725== Unified Memory profiling result:
Device "Tesla T4 (0)"
  Count  Avg Size  Min Size  Max Size  Total Size  Total Time  Name
    23  19.130KB  4.0000KB  48.000KB  440.0000KB  98.97300us  Host To Device
    1  12.000KB  12.000KB  12.000KB  12.00000KB  2.432000us  Device To Host
    1      -      -      -      -      336.8560us  Gpu page fault groups

```

```

==7055== NVPROF is profiling process 7055, command: ./zdo3
RUN 1: Number of Vertices = 8000 | Number of Edges = 35925 | ERROR COUNT (BELLMAN FORD): 0

==7055== Profiling application: ./zdo3
==7055== Profiling result:
   Type  Time(%)   Time     Calls      Avg        Min         Max   Name
GPU activities: 100.00% 374.30us    1 374.30us 374.30us 374.30us is_zero_indegree_parallel(node*, int, bool*)
  API calls: 99.52% 249.24ms    2 124.62ms 14.394us 249.23ms cudaMallocManaged
             0.15% 380.70us    1 380.70us 380.70us 380.70us cudaDeviceSynchronize
             0.15% 379.08us    3 126.36us 31.533us 200.08us cudaMemPrefetchAsync
             0.09% 217.97us    3 72.655us 3.0010us 137.97us cudaFree
             0.05% 124.75us   101 1.2350us 135ns 52.686us cuDeviceGetAttribute
             0.01% 29.226us    1 29.226us 29.226us 29.226us cudaLaunchKernel
             0.01% 28.105us    1 28.105us 28.105us 28.105us cuDeviceGetName
             0.01% 13.664us    2 6.8320us 1.8650us 11.799us cudaMemAdvise
             0.00% 7.0410us    1 7.0410us 7.0410us 7.0410us cudaGetDevice
             0.00% 5.2590us    1 5.2590us 5.2590us 5.2590us cuDeviceGetPCIBusId
             0.00% 1.8060us    3 602ns 156ns 1.4330us cuDeviceGetCount
             0.00% 1.4330us    2 716ns 265ns 1.1680us cuDeviceGet
             0.00% 554ns      1 554ns 554ns 554ns cuDeviceTotalMem
             0.00% 512ns      1 512ns 512ns 512ns cuModuleGetLoadingMode
             0.00% 220ns      1 220ns 220ns 220ns cuDeviceGetUuid

==7055== Unified Memory profiling result:
Device "Tesla T4 (0)"
  Count  Avg Size  Min Size  Max Size  Total Size  Total Time  Name
    23  19.130KB  4.0000KB  48.000KB  440.0000KB  97.75800us  Host To Device
    1  12.000KB  12.000KB  12.000KB  12.00000KB  2.432000us  Device To Host
    1      -      -      -      -      360.9200us  Gpu page fault groups

```

10k Nodes

```
==4501== NVPROF is profiling process 4501, command: ./zdo3
RUN 1: Number of Vertices = 10000 | Number of Edges = 44969 | ERROR COUNT (BELLMAN FORD): 0

==4501== Profiling application: ./zdo3
==4501== Profiling result:
   Type  Time(%)   Time    Calls      Avg      Min      Max  Name
GPU activities: 100.00% 383.39us    1 383.39us 383.39us 383.39us is_zero_indegree_parallel(node*, int, bool*)
  API calls: 99.13% 150.83ms    2 75.415ms 15.176us 150.81ms cudaMallocManaged
              0.27% 409.88us    1 409.88us 409.88us 409.88us cudaDeviceSynchronize
              0.27% 405.29us    3 135.10us 31.695us 196.75us cudaMemPrefetchAsync
              0.18% 279.14us    3 93.045us 3.6230us 188.54us cudaFree
              0.08% 118.43us   101 1.1720us 132ns 49.485us cuDeviceGetAttribute
              0.02% 36.604us    1 36.604us 36.604us 36.604us cuDeviceGetName
              0.02% 32.318us    1 32.318us 32.318us 32.318us cudaLaunchKernel
              0.01% 19.138us    2 9.5690us 1.9320us 17.206us cudaMemAdvise
              0.00% 7.5730us    1 7.5730us 7.5730us 7.5730us cudaGetDevice
              0.00% 6.2140us    1 6.2140us 6.2140us 6.2140us cuDeviceGetPCIBusId
              0.00% 2.0800us    3 693ns 221ns 1.5310us cuDeviceGetCount
              0.00% 1.0850us    2 542ns 311ns 774ns cuDeviceGet
              0.00% 483ns    1 483ns 483ns 483ns cuDeviceTotalMem
              0.00% 460ns    1 460ns 460ns 460ns cuModuleGetLoadingMode
              0.00% 219ns    1 219ns 219ns 219ns cuDeviceGetUuid

==4501== Unified Memory profiling result:
Device "Tesla T4 (0)"
  Count Avg Size Min Size Max Size Total Size Total Time Name
    27 20.296KB 4.0000KB 48.000KB 548.0000KB 116.0310us Host To Device
     1 16.000KB 16.000KB 16.000KB 16.0000KB 2.592000us Device To Host
     1 - - - - 370.3020us Gpu page fault groups
```

```
==7633== NVPROF is profiling process 7633, command: ./zdo3
RUN 1: Number of Vertices = 10000 | Number of Edges = 44969 | ERROR COUNT (BELLMAN FORD): 0

==7633== Profiling application: ./zdo3
==7633== Profiling result:
   Type  Time(%)   Time    Calls      Avg      Min      Max  Name
GPU activities: 100.00% 352.79us    1 352.79us 352.79us 352.79us is_zero_indegree_parallel(node*, int, bool*)
  API calls: 99.46% 256.58ms    2 128.29ms 19.357us 256.56ms cudaMallocManaged
              0.17% 437.29us    3 145.76us 31.370us 219.79us cudaMemPrefetchAsync
              0.15% 379.93us    1 379.93us 379.93us 379.93us cudaDeviceSynchronize
              0.11% 293.17us    3 97.724us 2.9490us 186.48us cudaFree
              0.07% 174.60us   101 1.7280us 188ns 70.691us cuDeviceGetAttribute
              0.01% 37.260us    1 37.260us 37.260us 37.260us cudaLaunchKernel
              0.01% 29.011us    1 29.011us 29.011us 29.011us cuDeviceGetName
              0.01% 17.355us    2 8.6770us 1.9670us 15.388us cudaMemAdvise
              0.01% 14.384us    1 14.384us 14.384us 14.384us cudaGetDevice
              0.00% 9.4720us    1 9.4720us 9.4720us 9.4720us cuDeviceGetPCIBusId
              0.00% 2.6320us    2 1.3160us 311ns 2.3210us cuDeviceGet
              0.00% 1.8620us    3 620ns 241ns 1.3250us cuDeviceGetCount
              0.00% 691ns    1 691ns 691ns 691ns cuDeviceTotalMem
              0.00% 399ns    1 399ns 399ns 399ns cuModuleGetLoadingMode
              0.00% 331ns    1 331ns 331ns 331ns cuDeviceGetUuid

==7633== Unified Memory profiling result:
Device "Tesla T4 (0)"
  Count Avg Size Min Size Max Size Total Size Total Time Name
    27 20.296KB 4.0000KB 48.000KB 548.0000KB 121.4370us Host To Device
     1 16.000KB 16.000KB 16.000KB 16.0000KB 2.688000us Device To Host
     1 - - - - 339.5120us Gpu page fault groups
```

```

==1799== NVPROF is profiling process 1799, command: ./zdo3
RUN 1: Number of Vertices = 10000 | Number of Edges = 44969 | ERROR COUNT (BELLMAN FORD): 0

==1799== Profiling application: ./zdo3
==1799== Profiling result:
   Type  Time(%)   Time    Calls      Avg      Min      Max  Name
GPU activities: 100.00% 350.11us    1 350.11us 350.11us 350.11us is_zero_indegree_parallel(node*, int, bool*)
  API calls: 99.15% 147.41ms    2 73.705ms 16.289us 147.39ms cudaMallocManaged
              0.27% 408.31us    3 136.10us 34.335us 193.30us cudaMemcpyPrefetchAsync
              0.24% 355.57us    1 355.57us 355.57us 355.57us cudaDeviceSynchronize
              0.19% 281.10us    3 93.700us 3.2170us 185.46us cudaFree
              0.09% 134.43us   101 1.3310us 129ns 51.908us cuDeviceGetAttribute
              0.02% 29.992us    1 29.992us 29.992us 29.992us cudaLaunchKernel
              0.02% 25.645us    1 25.645us 25.645us 25.645us cuDeviceGetName
              0.01% 13.659us    2 6.8290us 1.9890us 11.670us cudaMemAdvise
              0.01% 7.9070us    1 7.9070us 7.9070us 7.9070us cudaGetDevice
              0.00% 6.6490us    1 6.6490us 6.6490us 6.6490us cuDeviceGetPCIBusId
              0.00% 2.5030us    3 834ns 253ns 1.9280us cuDeviceGetCount
              0.00% 1.0090us    2 504ns 295ns 714ns cuDeviceGet
              0.00% 551ns    1 551ns 551ns 551ns cuDeviceTotalMem
              0.00% 491ns    1 491ns 491ns 491ns cuModuleGetLoadingMode
              0.00% 236ns    1 236ns 236ns 236ns cuDeviceGetUuid

==1799== Unified Memory profiling result:
Device "Tesla T4 (0)"
   Count  Avg Size  Min Size  Max Size  Total Size  Total Time  Name
      27  20.296KB  4.0000KB  44.000KB  548.0000KB  116.5750us  Host To Device
       1 16.000KB 16.000KB 16.000KB 16.0000KB  2.688000us  Device To Host
       1    -    -    -    -    336.7340us  Gpu page fault groups

```

```

==8056== NVPROF is profiling process 8056, command: ./zdo3
RUN 1: Number of Vertices = 10000 | Number of Edges = 44969 | ERROR COUNT (BELLMAN FORD): 0

==8056== Profiling application: ./zdo3
==8056== Profiling result:
   Type  Time(%)   Time    Calls      Avg      Min      Max  Name
GPU activities: 100.00% 392.50us    1 392.50us 392.50us 392.50us is_zero_indegree_parallel(node*, int, bool*)
  API calls: 99.40% 249.60ms    2 124.80ms 35.615us 249.57ms cudaMallocManaged
              0.22% 559.98us    3 186.66us 34.585us 309.25us cudaMemcpyPrefetchAsync
              0.17% 425.70us    1 425.70us 425.70us 425.70us cudaDeviceSynchronize
              0.11% 282.49us    3 94.161us 3.2220us 193.83us cudaFree
              0.05% 132.86us   101 1.3150us 144ns 56.111us cuDeviceGetAttribute
              0.02% 44.035us    1 44.035us 44.035us 44.035us cudaLaunchKernel
              0.01% 29.968us    1 29.968us 29.968us 29.968us cuDeviceGetName
              0.01% 15.300us    2 7.6500us 2.5350us 12.765us cudaMemAdvise
              0.00% 10.225us    1 10.225us 10.225us 10.225us cuDeviceGetPCIBusId
              0.00% 7.4950us    1 7.4950us 7.4950us 7.4950us cudaGetDevice
              0.00% 1.9240us    3 641ns 198ns 1.4980us cuDeviceGetCount
              0.00% 786ns    2 393ns 237ns 549ns cuDeviceGet
              0.00% 530ns    1 530ns 530ns 530ns cuModuleGetLoadingMode
              0.00% 470ns    1 470ns 470ns 470ns cuDeviceTotalMem
              0.00% 262ns    1 262ns 262ns 262ns cuDeviceGetUuid

==8056== Unified Memory profiling result:
Device "Tesla T4 (0)"
   Count  Avg Size  Min Size  Max Size  Total Size  Total Time  Name
      27  20.296KB  4.0000KB  44.000KB  548.0000KB  122.1090us  Host To Device
       1 16.000KB 16.000KB 16.000KB 16.0000KB  2.656000us  Device To Host
       1    -    -    -    -    379.1270us  Gpu page fault groups

```

```
==2436== NVPROF is profiling process 2436, command: ./zdo3
RUN 1: Number of Vertices = 10000 | Number of Edges = 44969 | ERROR COUNT (BELLMAN FORD): 0

==2436== Profiling application: ./zdo3
==2436== Profiling result:
      Type  Time(%)   Time    Calls      Avg      Min      Max  Name
GPU activities: 100.00% 360.73us    1 360.73us 360.73us 360.73us is_zero_indegree_parallel(node*, int, bool*)
  API calls: 99.17% 156.98ms    2 78.492ms 21.623us 156.96ms cudaMallocManaged
              0.27% 420.45us    3 140.15us 32.394us 211.92us cudaMemPrefetchAsync
              0.23% 369.53us    1 369.53us 369.53us 369.53us cudaDeviceSynchronize
              0.17% 264.19us    3 88.063us 3.3330us 160.66us cudaFree
              0.11% 168.88us   101 1.6720us   150ns 80.829us cuDeviceGetAttribute
              0.02% 32.803us    1 32.803us 32.803us 32.803us cudaLaunchKernel
              0.02% 28.336us    1 28.336us 28.336us 28.336us cuDeviceGetName
              0.01% 12.891us    2 6.4450us 1.8820us 11.009us cudaMemAdvise
              0.00% 7.7420us    1 7.7420us 7.7420us 7.7420us cuDeviceTotalMem
              0.00% 7.1250us    1 7.1250us 7.1250us 7.1250us cuDeviceGetPCIBusId
              0.00% 3.9800us    1 3.9800us 3.9800us 3.9800us cudaGetDevice
              0.00% 2.0200us    3   673ns   238ns 1.4690us cuDeviceGetCount
              0.00% 1.0390us    2   519ns   287ns   752ns cuDeviceGet
              0.00% 416ns     1   416ns   416ns   416ns cuModuleGetLoadingMode
              0.00% 276ns     1   276ns   276ns   276ns cuDeviceGetUuid

==2436== Unified Memory profiling result:
Device "Tesla T4 (0)"
  Count  Avg Size  Min Size  Max Size  Total Size  Total Time  Name
    27   20.296KB  4.0000KB  48.000KB  548.0000KB  117.4720us  Host To Device
     1   16.000KB  16.000KB  16.000KB  16.00000KB  2.656000us  Device To Host
     1      -      -      -      -      347.5180us  Gpu page fault groups
```