**Parallelizing the program named “circuit\_serial.cpp” using IPT**

**Note 1:** This program was obtained from the following website:

<https://people.sc.fsu.edu/~jburkardt/c_src/c_src.html>

**Note 2:** Questions posed by IPT are in black colored font and bold-face

The usage instructions are as follows.

1. Log in to Stampede and start an idev session for getting access to a compute node

login4$ **idev**

2. Start parallelizing the test case – you will see some warning messages and the typos in questions – these can be ignored as of now. We are generating the MPI version in this example.

c557-903$ /**work/01698/rauta/testIPT/IPT\_Demo/IPT /work/01698/rauta/testIPT/IPT\_Demo/circuit\_serial.cpp**

NOTE: We currently support only C and C++ programs.

**Please enter which type of parallel program you want to create.**

**1. MPI**

**2. OpenMP**

**3. CUDA.**

1

**Which of the following patterns whould you like?**

**1. Single For-Loop Parallelization**

**2. Nested For-Loop Parallelization**

**3. Stencil**

**4. Pipeline**

**5. Data Distribution and Data Collection**

**6. Data Distribution**

**7. Data Collection**

1

**Please enter the name of the function that you wish to parallelize.**

main

for(i = 1;i <= n;i++) {ihi =(ihi \* 2);}

**Is this the for loop you are looking for?(y/n)**

n

for(i = 0;i < ihi;i++) {i4\_to\_bvec(i,n,bvec);value = circuit\_value(n,bvec);if(value == 1) {solution\_num =(solution\_num + 1);for(j = 0;j < n;j++) {}}}

**Is this the for loop you are looking for?(y/n)**

y

**Would you like to do the data collection of a**

**1. Variable**

**2. Array.**

**3. Both Variables and Arrays**

1

**Please enter the number of variables that you would like to perform reduction operations on. If there are no variables to reduce please enter 0.**

1

**Please select a variable to perform the reduce operation on. List of possible variables are:**

**1. n type is int**

**2. bvec type is int [23UL]**

**3. value type is int**

**4. solution\_num type is int**

4

**Please select the reduce operation to use for variable**

**1. Sum**

**2. Product**

**3. Min**

**4. Max.**

1

**Would you like to send the results after reducing the chosen variable to all processes or to only one?(1. all 0. one)** 1

Variable Declarations complete.

**Would you like to do this MPI pattern again?(Y/N)**

n

**Are you writing anything?(Y/N)**

n

Running Consistency Tests

3. The generated code will be named as: rose\_circuit\_serial\_MPI.cpp

c557-903$ **ls -ltr**

-rw-r--r-- 1 rauta G-25072 3229 Nov 1 19:58 rose\_circuit\_serial\_MPI.cpp

4. Compile the generated code

c557-903$ **mpicxx -o rose\_circuit\_serial\_MPI** **rose\_circuit\_serial\_MPI.cpp**

5. Test the generated code – in the command below, we are testing the code using two MPI processes

c557-804$ **ibrun -np 2 rose\_circuit\_serial\_MPI**

TACC: Starting up job 7813349

TACC: Setting up parallel environment for MVAPICH2+mpispawn.

TACC: Starting parallel tasks...

01 November 2016 08:29:16 PM01 November 2016 08:29:16 PM

Number of solutions found was 15

Number of solutions found was 15

Elapsed wall clock time (seconds) 0.161295

Elapsed wall clock time (seconds) 0.161296

01 November 2016 08:29:16 PM

01 November 2016 08:29:16 PM

TACC: Shutdown complete. Exiting.