Parallel and Distributed Computing

CSE4001

Fall Semester 2020-21

Lab Assignment 1

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**Aim:**

Write a simple OpenMP program to demonstrate the parallel loop construct.

1. Use OMP\_SET\_THREAD\_NUM( ) and OMP\_GET\_THREAD\_NUM( ) to find the number of processing unit
2. Use function invoke to print ‘Hello World’
3. To examine the above scenario, the functions such as omp\_get\_num\_procs(),

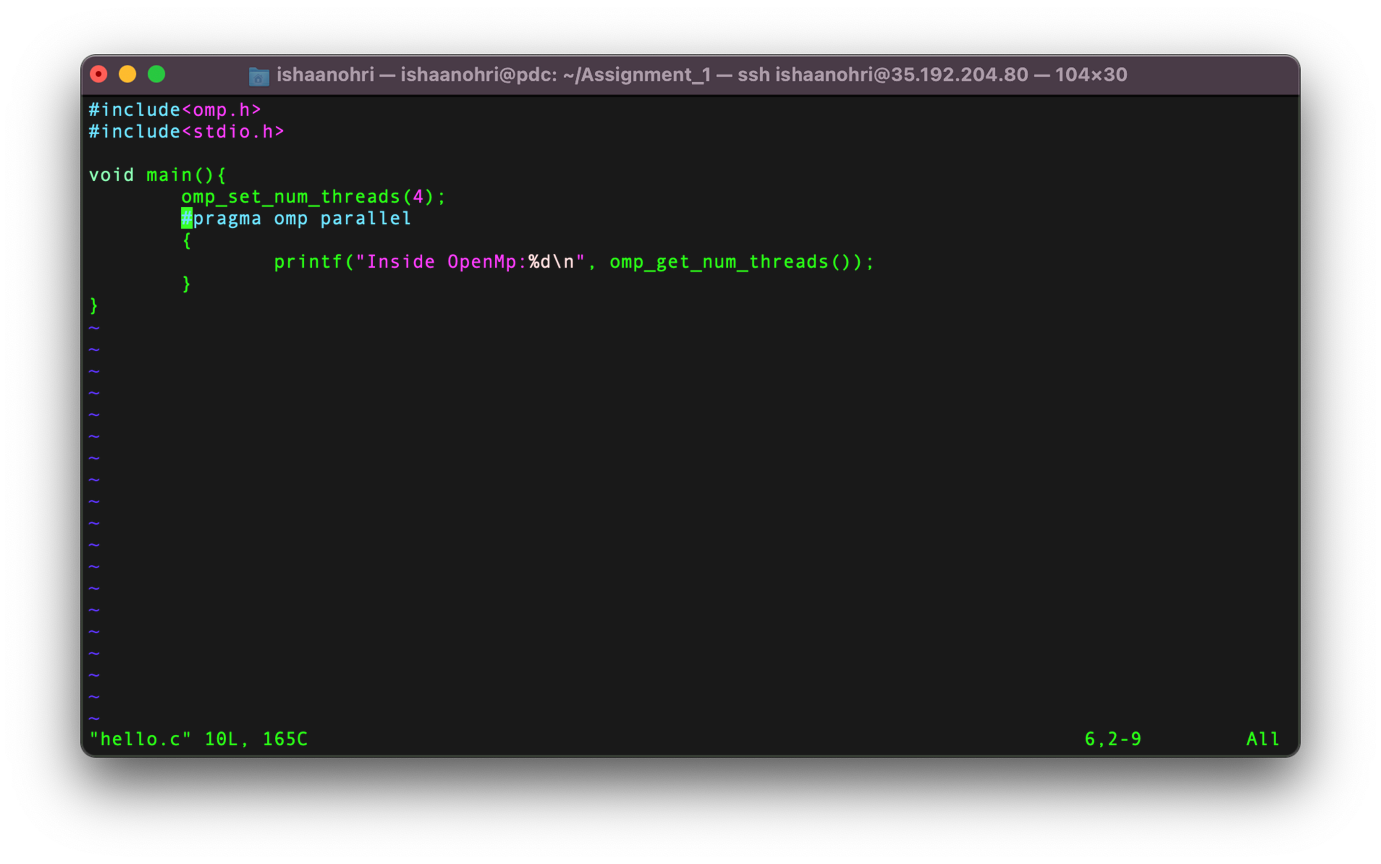
omp\_set\_num\_threads(), omp\_get\_num\_threads(), omp\_in\_parallel(), omp\_get\_dynamic() and omp\_get\_nested() are listed and the explanation is given below to explore the concept practically.  
omp\_set\_num\_threads() - takes an integer argument and requests that the Operating System provide that number of threads in subsequent parallel regions. omp\_get\_num\_threads() (integer function) - returns the actual number of threads in the current team of threads.

omp\_get\_thread\_num() (integer function) - returns the ID of a thread, where the ID ranges from 0 to the number of threads minus 1. The thread with the ID of 0 is the master thread.  
omp\_get\_num\_procs() - returns the number of processors that are available when the function is called.

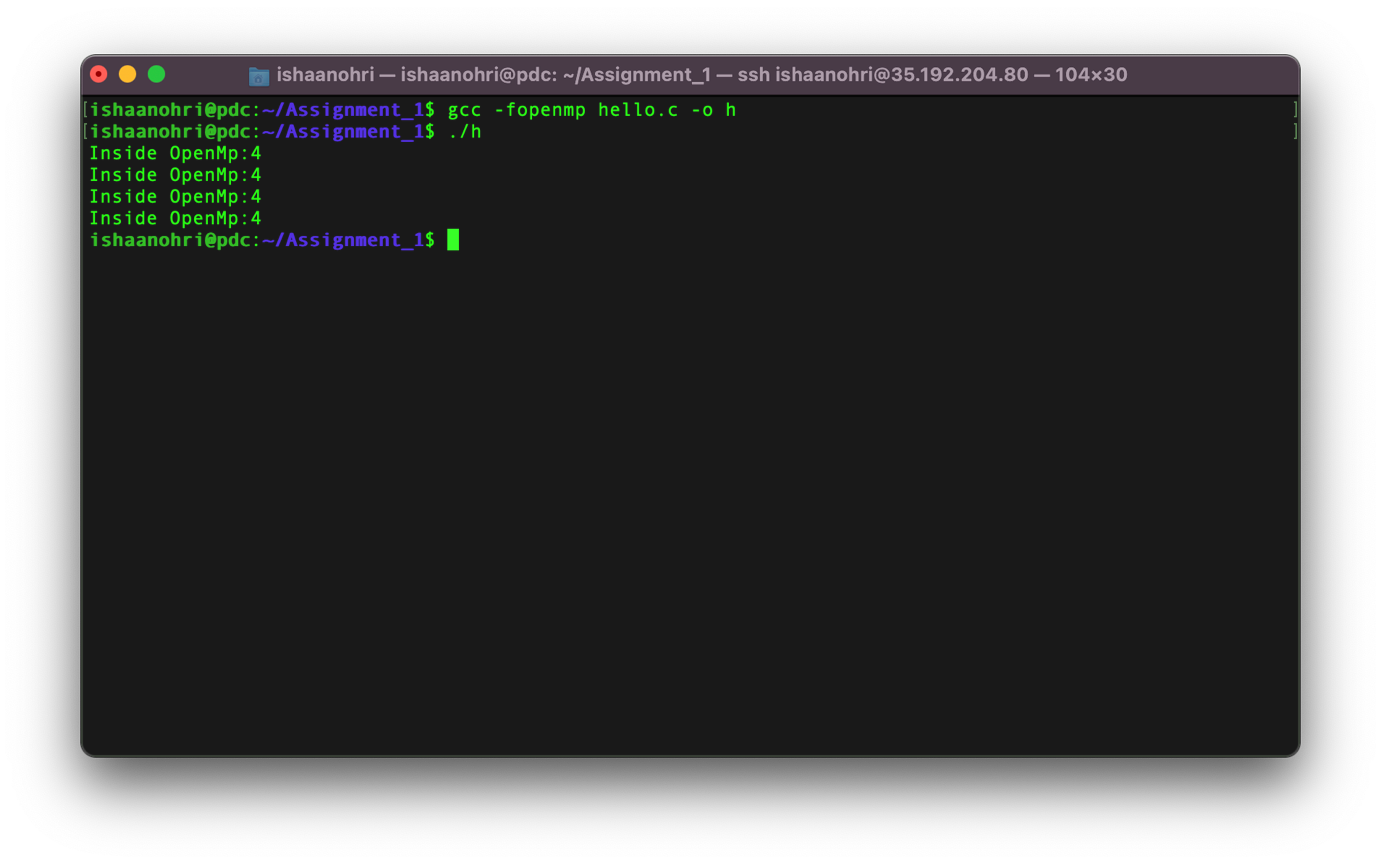
omp\_get\_dynamic() - returns a value that indicates if the number of threads available in subsequent parallel region can be adjusted by the run time. o omp\_get\_nested( ) returns a value that indicates if nested parallelism is enabled.

omp\_set\_num\_threads() and omp\_get\_num\_threads()

**Source Code:**

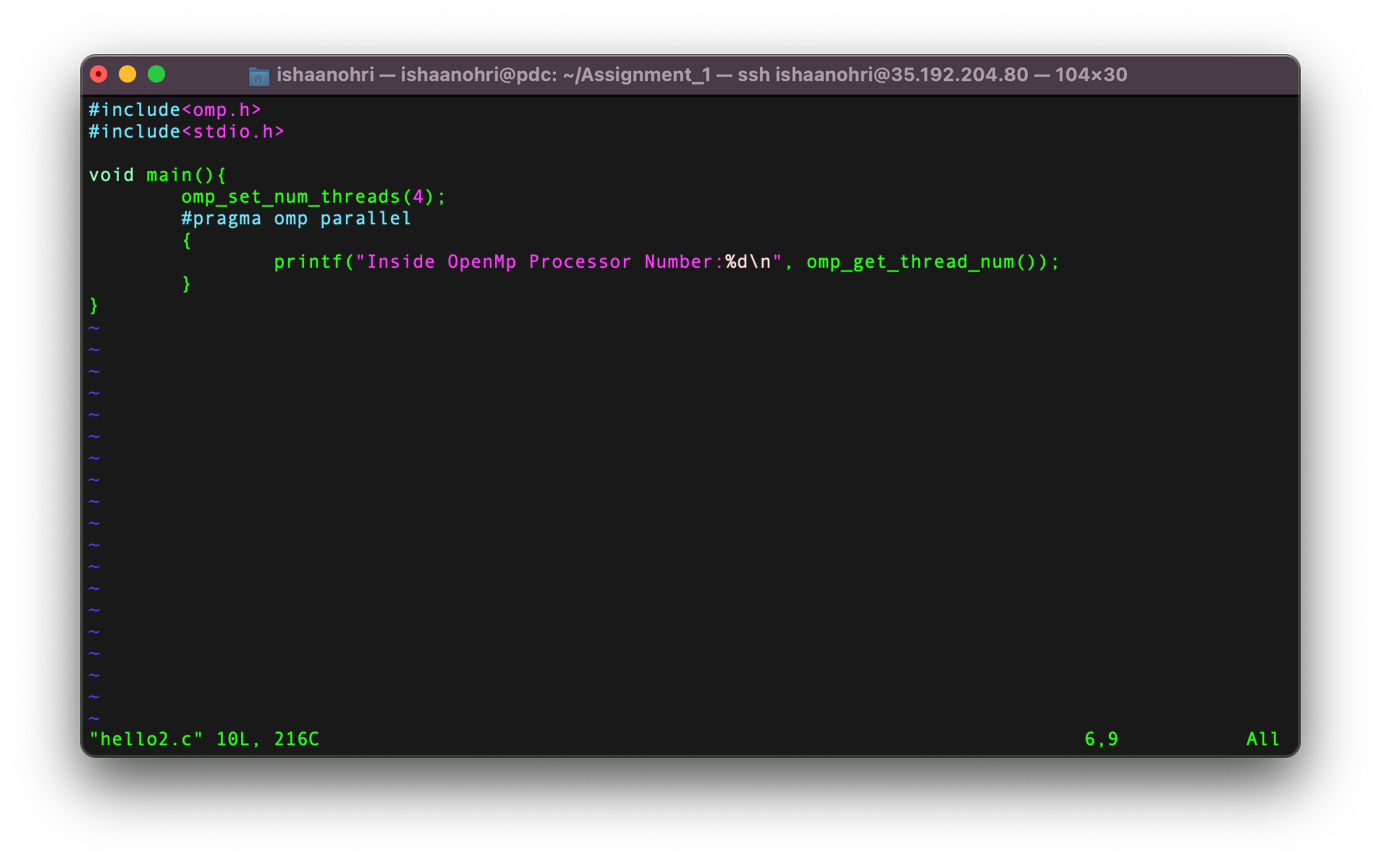
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**Execution:**

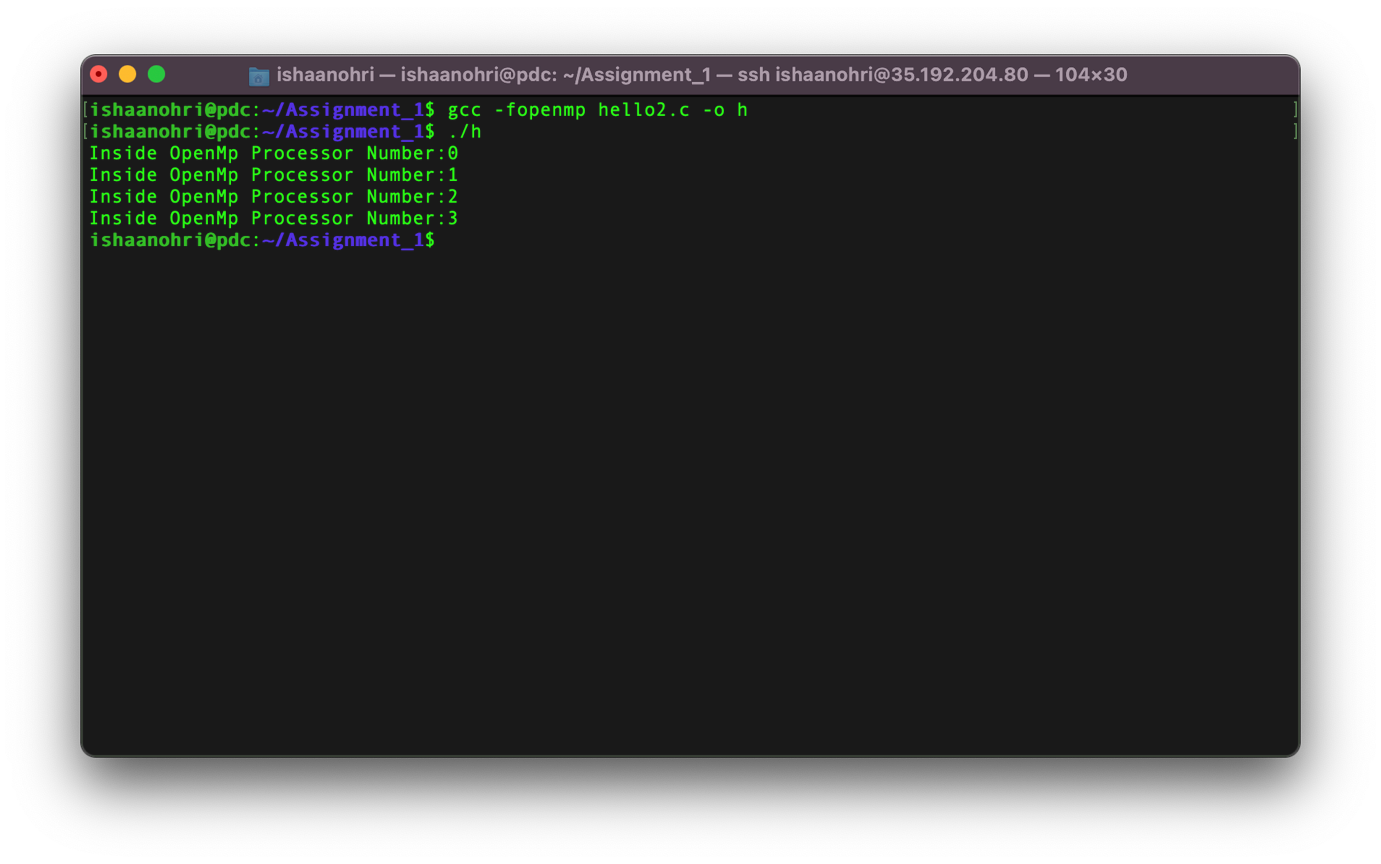
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omp\_set\_num\_threads() and omp\_get\_thread\_num()

**Source Code:**

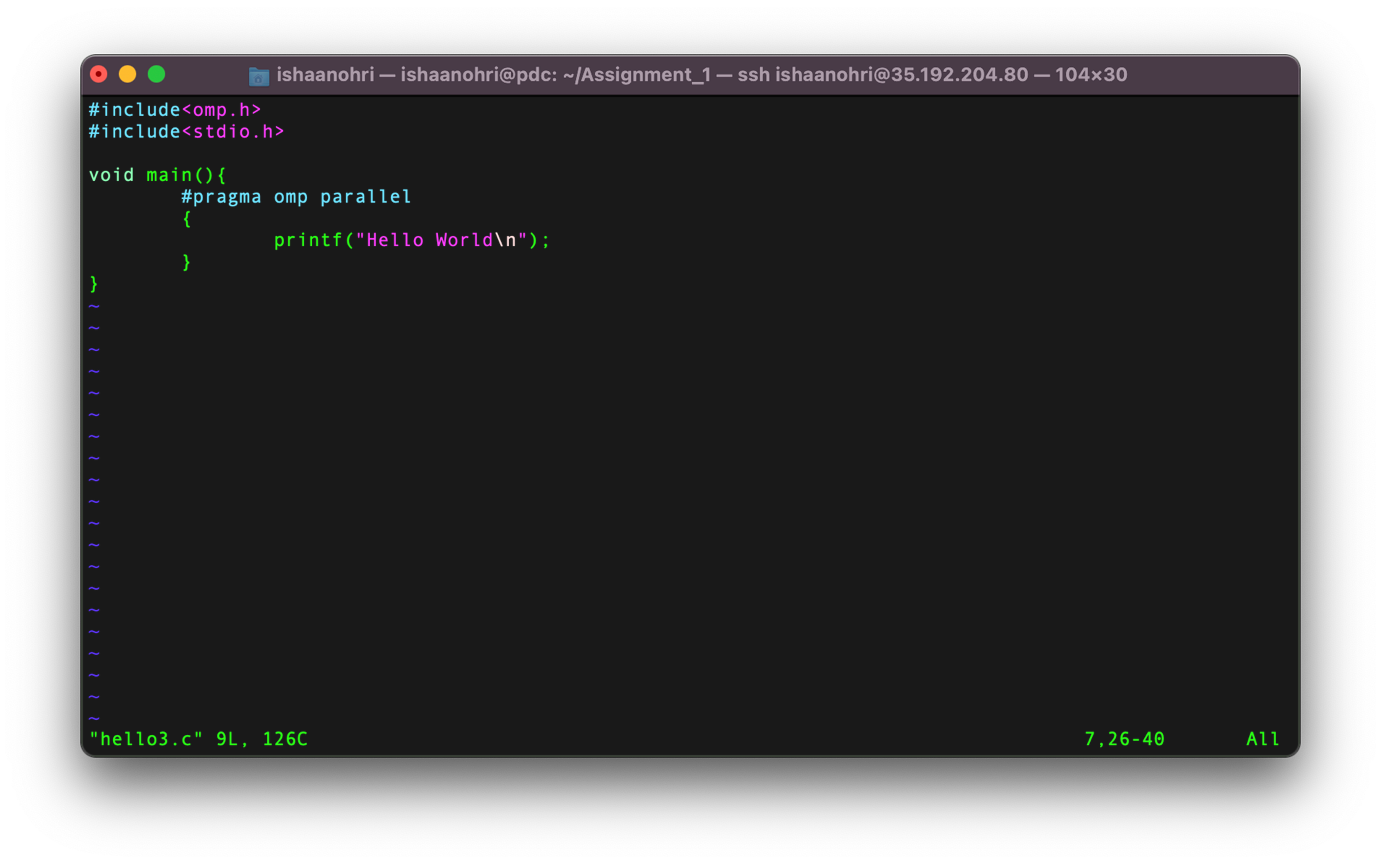
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**Execution:**

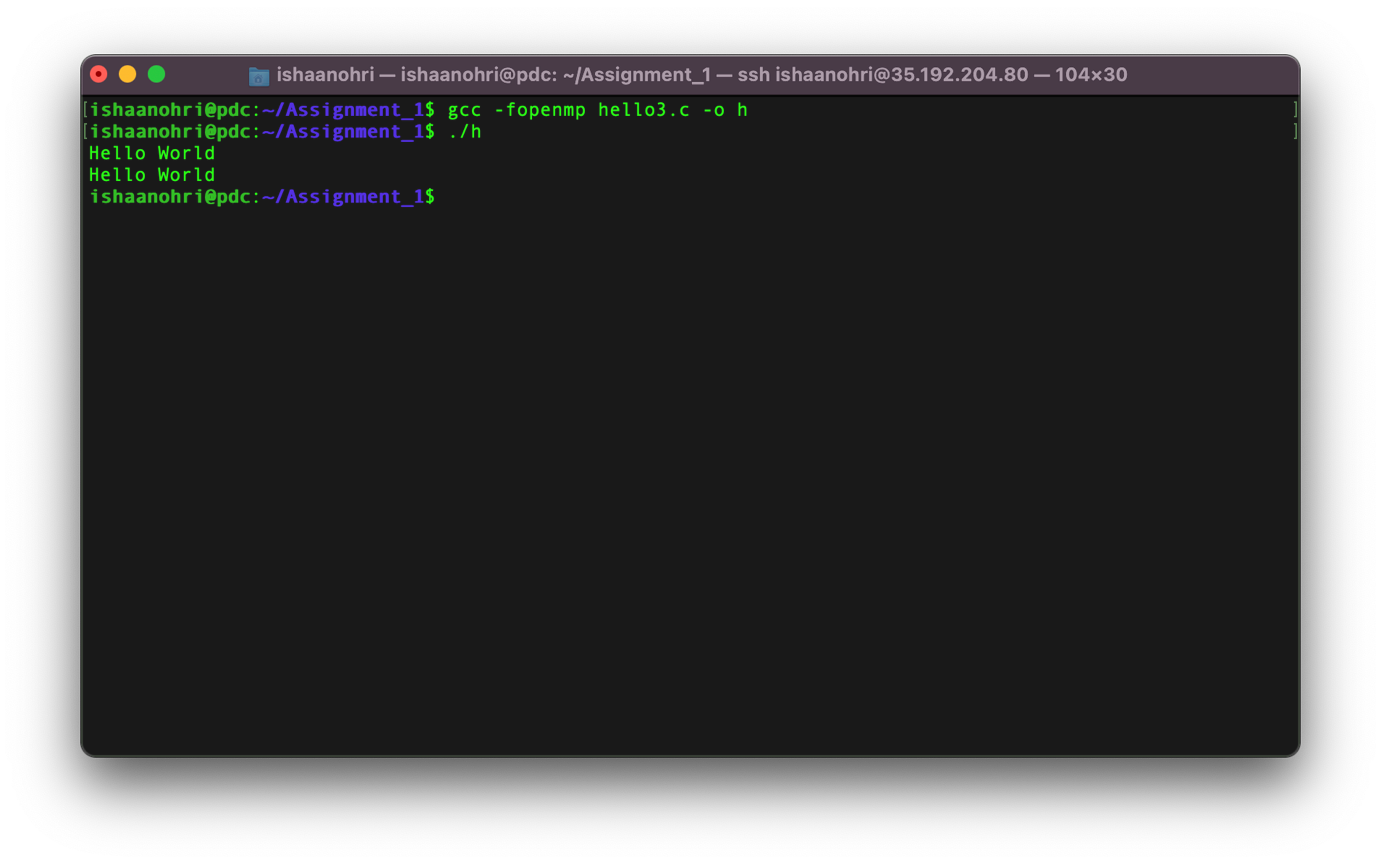
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Invoking ‘Hello World’

**Source Code:**

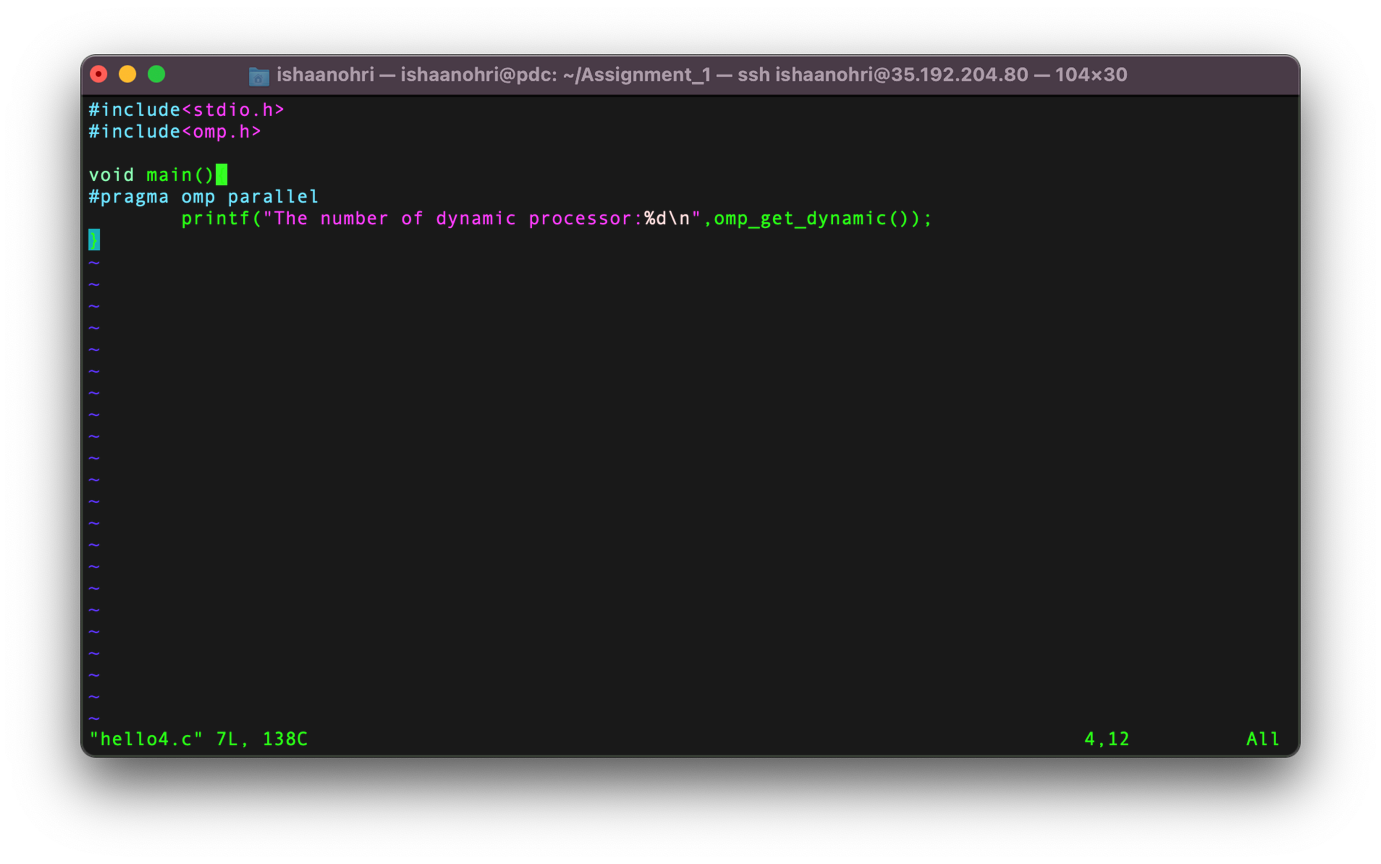
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**Execution:**

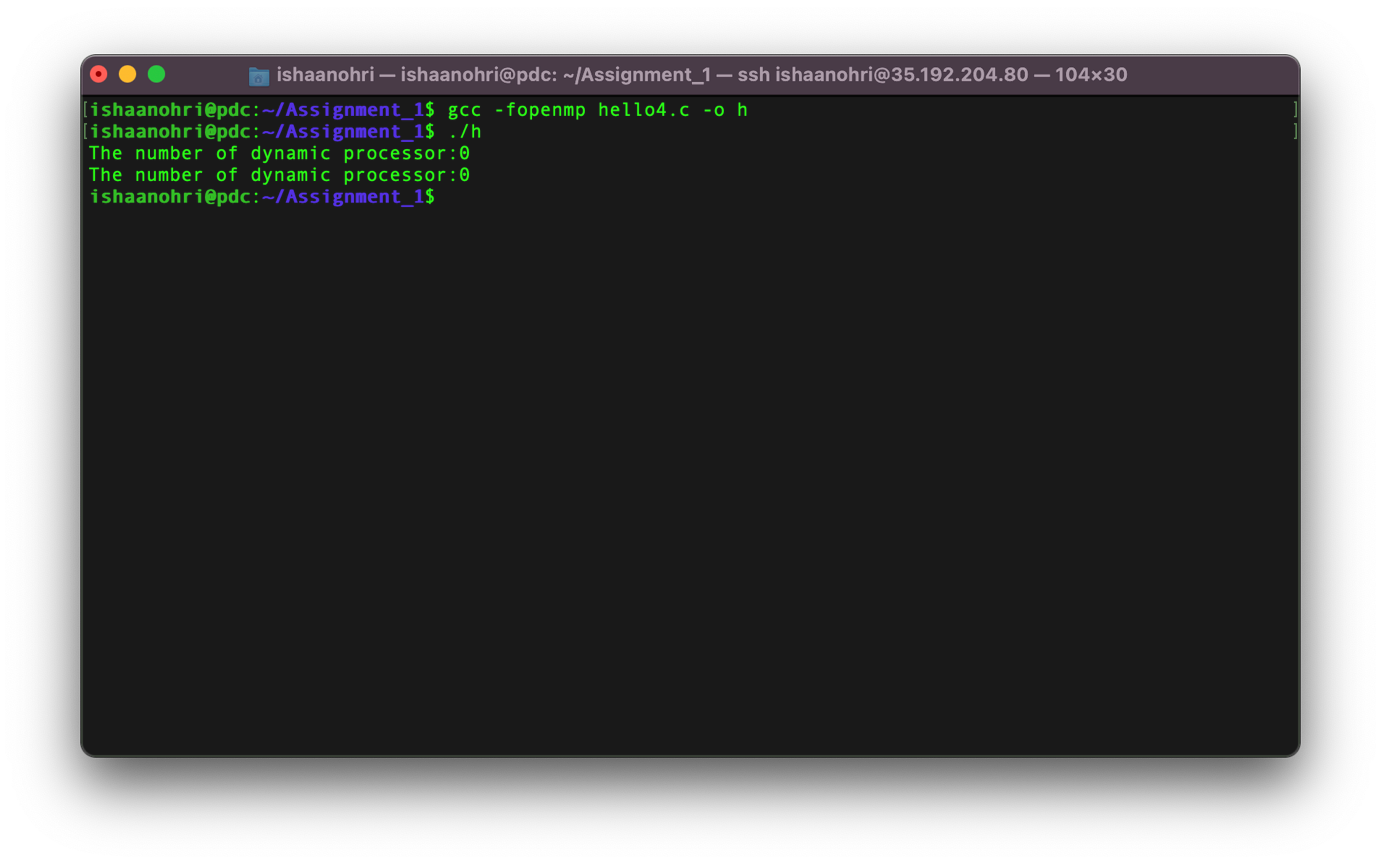
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omp\_get\_dynamic()

**Source Code:**

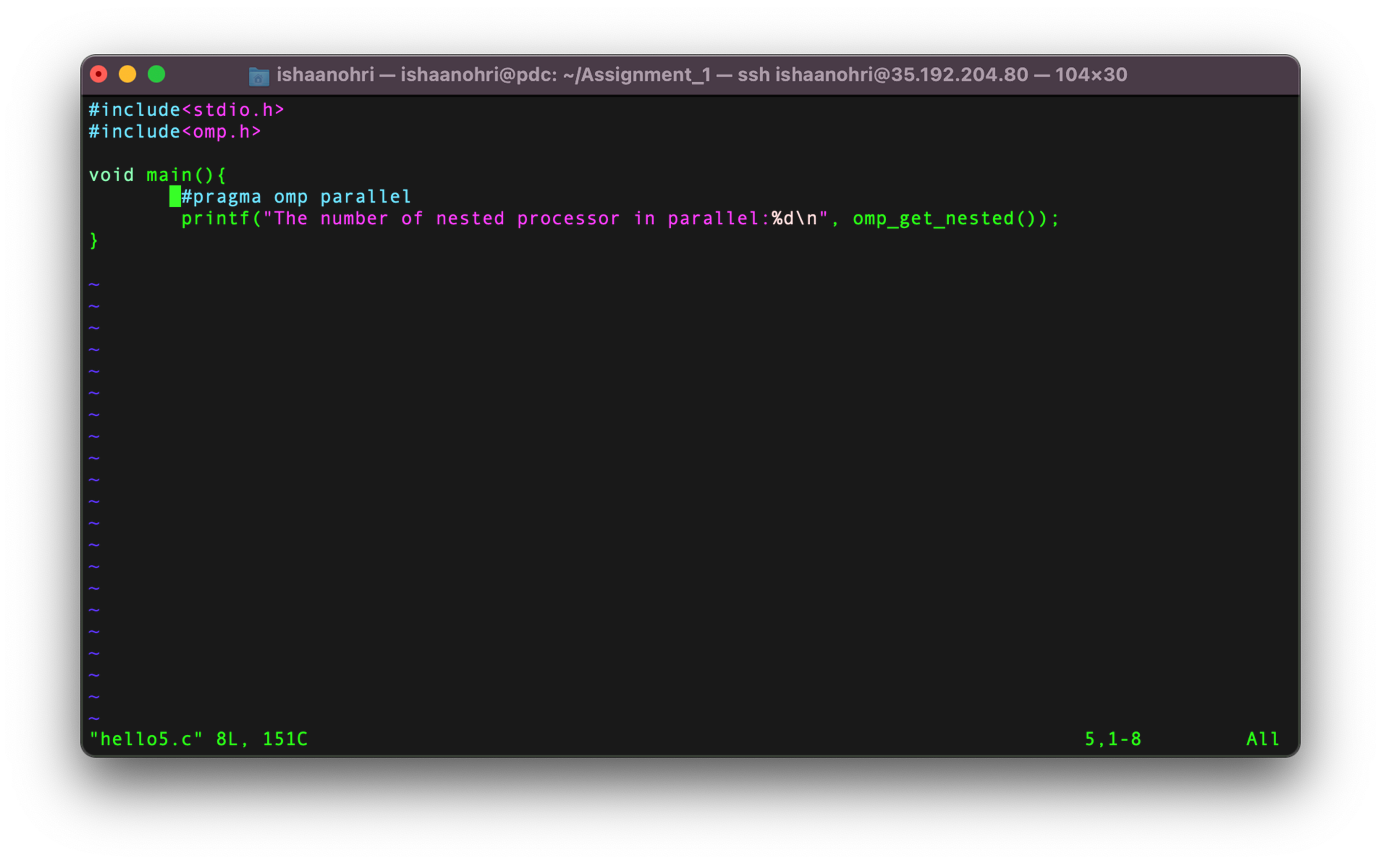
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**Execution:**

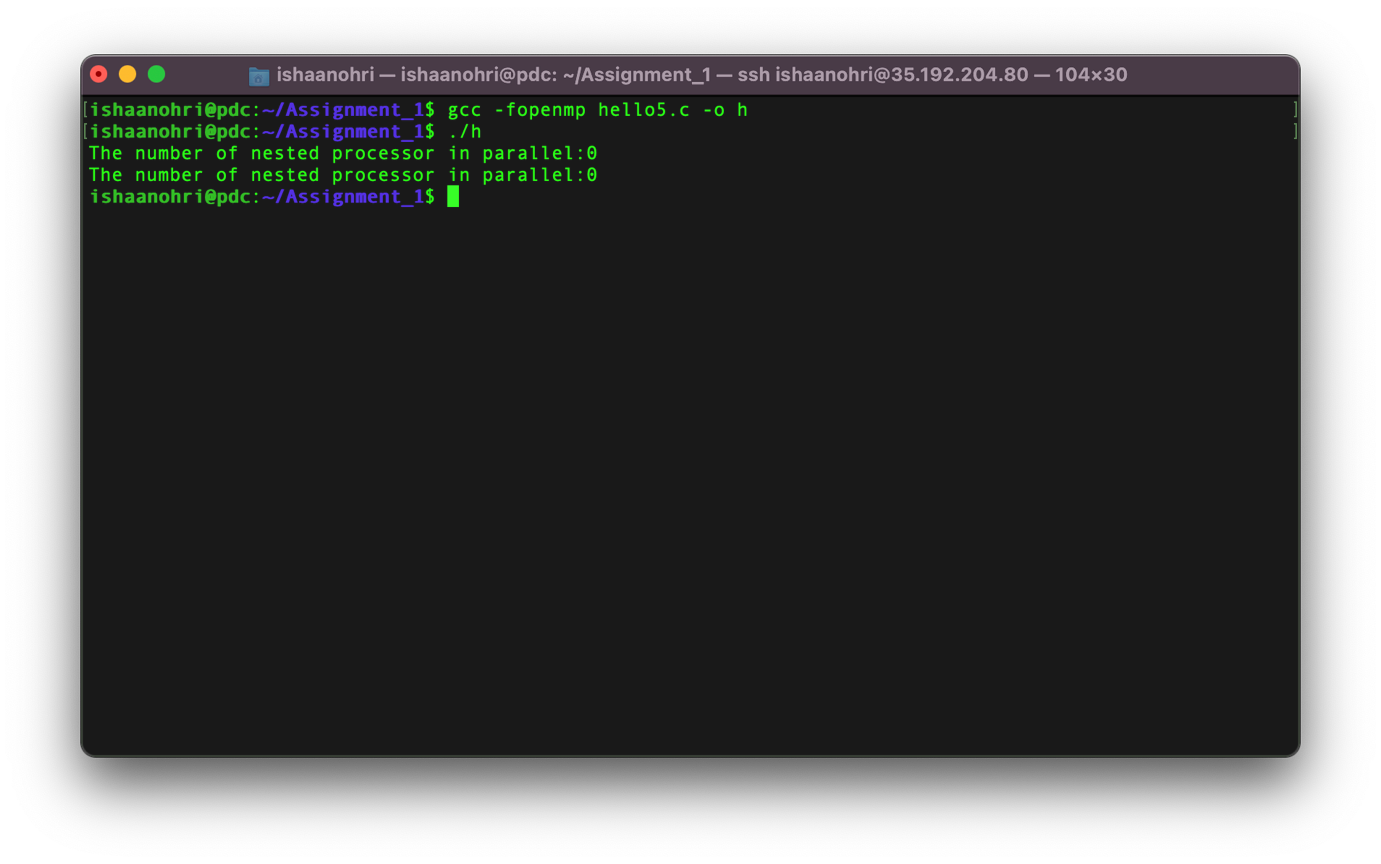
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omp\_get\_nested()

**Source Code:**

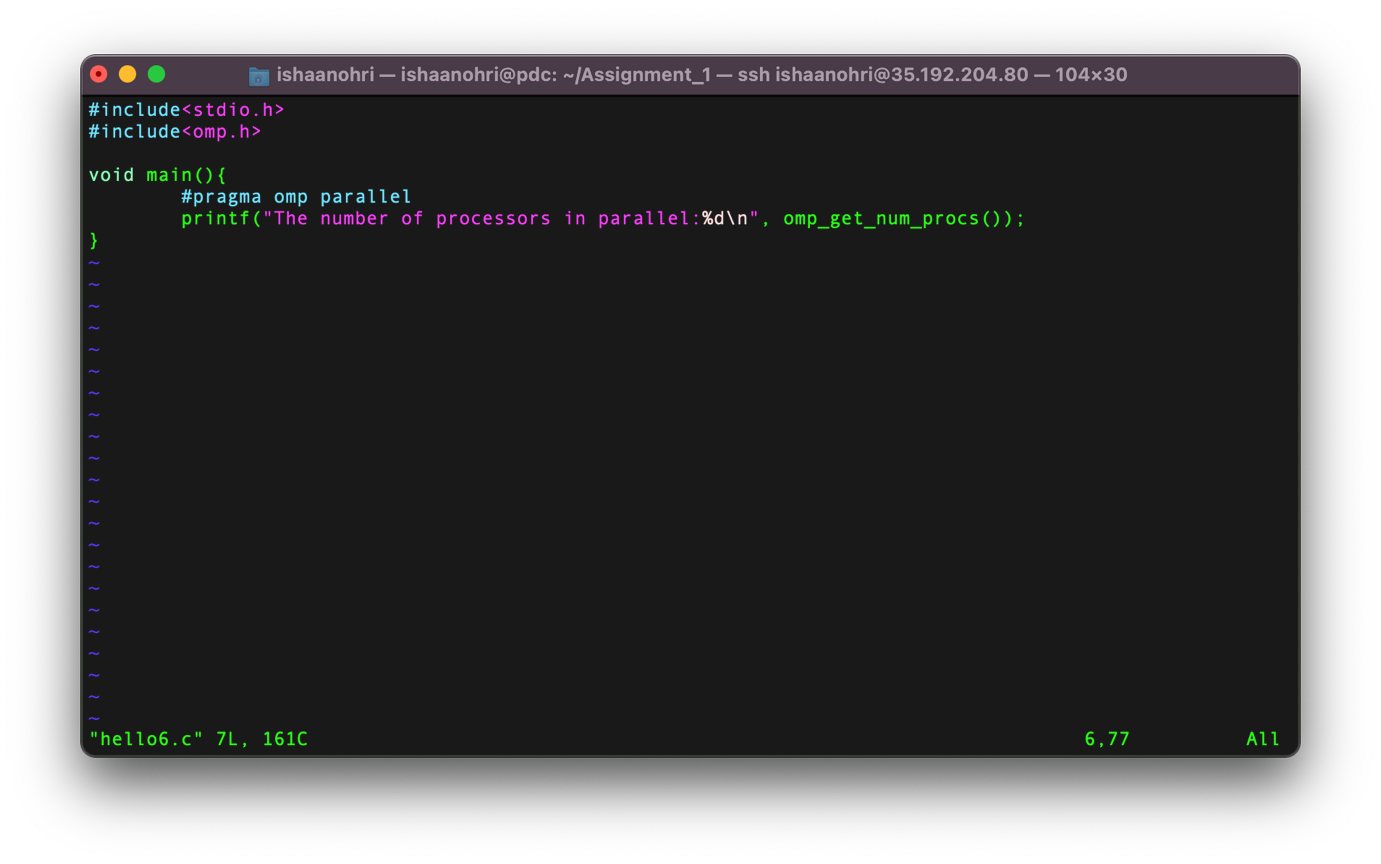
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**Execution:**

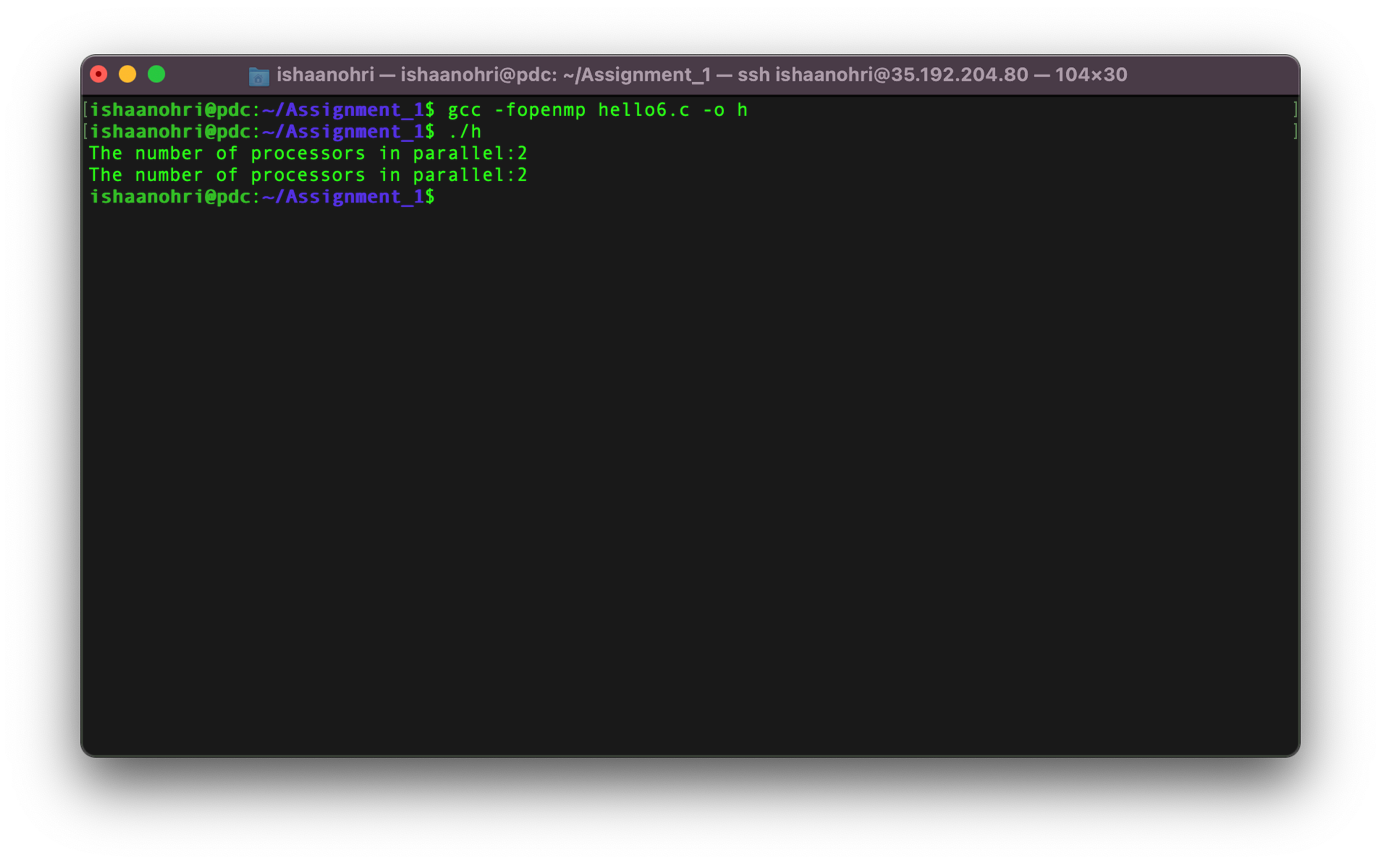
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omp\_get\_num\_procs()

**Source Code:**

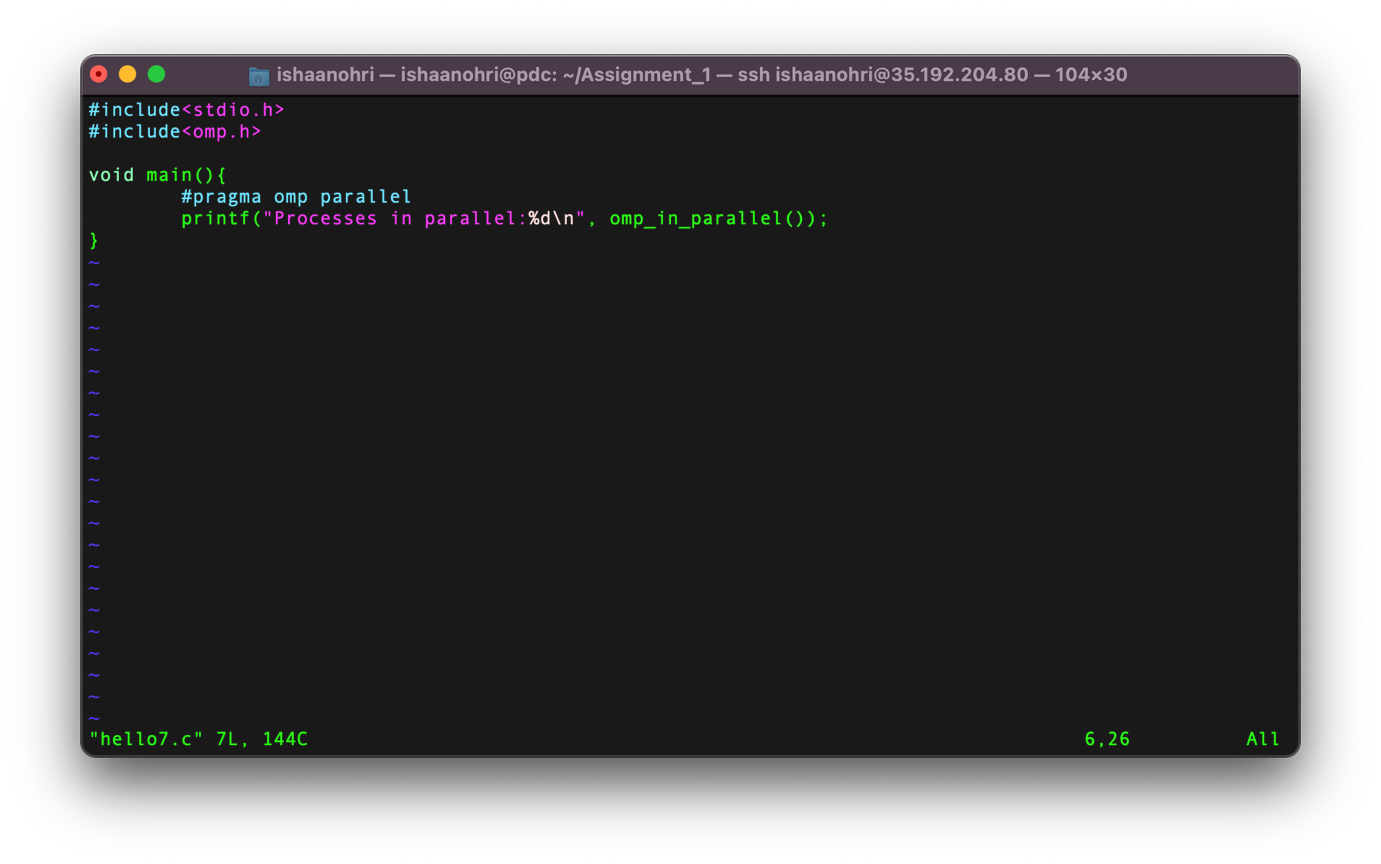
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**Execution:**

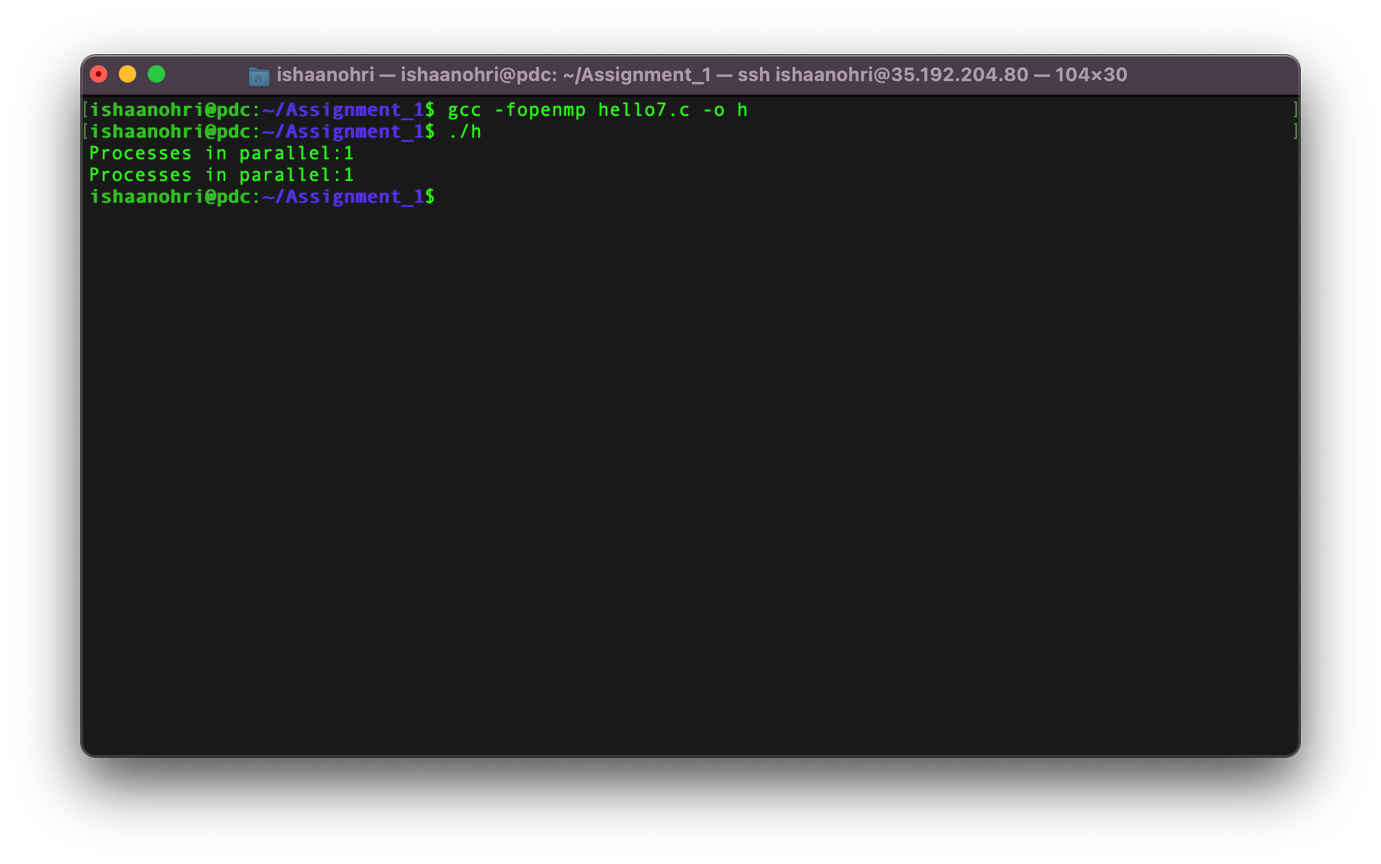
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omp\_in\_parallel()

**Source Code:**

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**Execution:**

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**Remarks:**

The above experiment was conducted and all results along with the source code have been attached above in the document. The experiment was assisted by Dr Deepak. I thank sir for his assistance.