

# MPI Programming Tutorial

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## 1.A. Getting Started

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# Hello World!

```
#include <mpi.h>
#include <stdio.h>

int main(int argc, char *argv[]) {
    int size, rank, len;
    char name[MPI_MAX_PROCESSOR_NAME];

    int provided;
    MPI_Init_thread(&argc, &argv, MPI_THREAD_MULTIPLE, &provided);

    MPI_Comm_size(MPI_COMM_WORLD, &size);
    MPI_Comm_rank(MPI_COMM_WORLD, &rank);
    MPI_Get_processor_name(name, &len);

    printf("Hello, World! I am process %d of %d on %s.\n", rank, size, name);

    MPI_Finalize();
    return 0;
}
```

<https://github.com/erdc/mpi4py/blob/master/demo/helloworld.c>

# Hello World!

```
#if defined(MPI_VERSION) && (MPI_VERSION >= 2)
    int provided;
    MPI_Init_thread(&argc, &argv, MPI_THREAD_MULTIPLE, &provided);
#else
    MPI_Init(&argc, &argv);
#endif
```

<https://github.com/erdc/mpi4py/blob/master/demo/helloworld.c>

# Message Aggregation

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## References

- [1] <http://en.wikipedia.org/>
- [2] [http://static.msi.umn.edu/tutorial/scicomp/general/MPI/mpi\\_coll\\_new.html](http://static.msi.umn.edu/tutorial/scicomp/general/MPI/mpi_coll_new.html)
- [3] <https://computing.llnl.gov/tutorials/mpi/>
- [4] <https://computing.llnl.gov/tutorials/mpi/>
- [5] Hager & Wellein, Introduction to High Performance Computing for Scientists and Engineers
- [6] <http://www.mpi-forum.org/docs/mpi-11-html>