# Question:

Write comparison between parallel and sequential computation.

Answer:

Parallel Computation:

1. In the simplest sense, parallel computing is the simultaneous use of multiple compute resources to solve a computational problem.
2. A problem is broken into discrete parts that can be solved concurrently.
3. Each part is further broken down to a series of instructions.
4. Instructions from each part execute simultaneously on different processors.
5. Execute multiple program instructions at any moment in
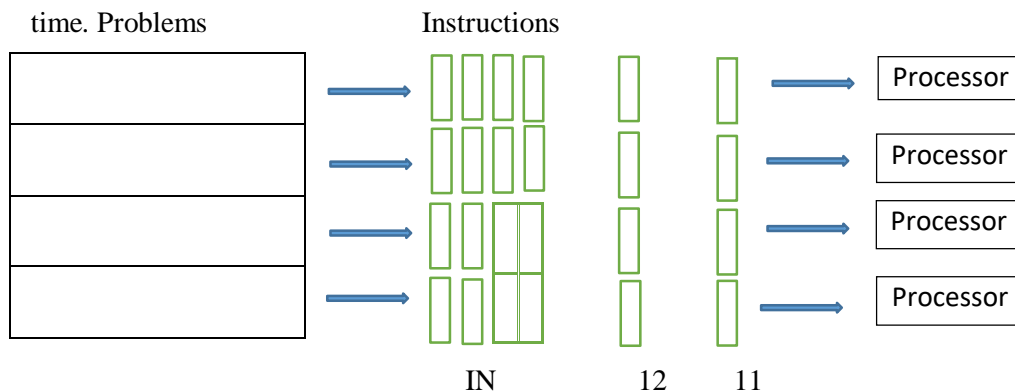
6. In parallel computation problems are solved in less time with multiple compute resources. The compute resources are typically,

→ A Single computer with multiple processor/core.

→ An arbitrary number of such computers connected by a network.

7. In parallel computation, throwing more resources at a task will shorten it's time to completion, with potential cost savings.
8. Many problems are so large or complex that it is impractical or impossible to solve them on a single computer, especially given limited computer memory. So parallel computing is used to solve such problems.
9. Parallel computation provides concurrency since multiple compute resources can do many things simultaneously.

Sequential Computation:

1. Traditionally, software has been written for sequential computation.
2. A problem is broken into a discrete series of instructions.
3. Instructions are executed into a discrete series of instructions.
4. Instructions are executed sequentially one after another.
5. Executed on a single processor.
6. Only one instruction may execute at any moment in time.

Problem
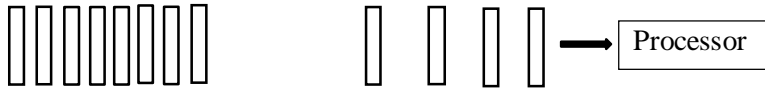
IN 13 12 11

7. In sequential computation, throwing fewer resources at a task will longer it's time to completion, with more potential cost.
8. Simple problems that are practical are possible to solve them on a single computer, especially given limited computer memory are solved by using sequential computation.
9. Sequential computation provides less concurrency since single compute resources can only do few thing at a time.

By Kanwal Saeed & Maria Malik (MPhil 2020)