Cloud computing considers an important paradigm that provides services and dynamic virtual resources to the consumers over the internet. One of the main challenges and important fields for research in the cloud computing environment is load balancing. So the main goal of this thesis is to establish an effective load balancing algorithm for task scheduling.

In cloud computing environment, the demands are executed into the virtual machines (VMs) and in the execution, it must be avoided a situation some of the resources are under loaded states while there are resources overloaded or heavy while achieving less the execution time of the tasks and response time.

In this thesis, we present the Load Balancing Decision Algorithm (LBDA) which aims to achieve load balancing for reducing the: Total completion time (Makespan), Response time and Total execution time of tasks in cloud computing environment.

The mechanism of LBDA is based on three functions, first: calculating the virtual machine capacity, virtual machine load then determining VM states (Under loaded, Balance, High balance, Overloaded) based on comparing VM capacity, VM load and using three thresholds: threshold upper; threshold fair; and threshold lower.

Second: estimating the time required to complete executing the task in each VM. Finally, making a decision to distribute the tasks among the VMs based on VM state and task time required. Where checked task time required into VMs under states and selecting the fastest VM, when there are more than one VMs have the same time to complete a task, LBDA assigns a task to VMs which has the largest capacity. When all VMs become (Balance or High balance) states, the tasks are distributed between VMs depending on the fastest execution. The proposed LBDA was compared with Max-Min, Shortest Job First and Round Robin algorithms. We applied many experiments with various VMs' capacity and: A different number of tasks on a different number of VMs, The same number of tasks on a different number of VMs, and A different number of tasks on a different number of VMs.

The performance evaluation results implemented in cloudsim toolkit 3.0.3 and the experiments demonstrate that our proposed LBDA outperformed to other algorithms by reducing the completion time of tasks, response time, and total execution time of tasks.