VISVESVARAYA TECHNOLOGICAL UNIVERSITY

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A MINI PROJECT REPORT
ON

"DOUBLE ENDED QUEUE"

Submitted in the partial fulfillment of the requirement of the award of
Bachelor Of Engineering
in
Computer Science and Engineering
Submitted By

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CERTIFICATE

This is to certify that the technical mini project work entitled " Double Ended Queue" is a bonafied work carried out by **AKASH BS, DEEPAK PATEL, DHEERAJ DP** bearing the USN number **1BO15CS003, 1BO15CS023, 1BO15CS026** in partial fulfillment for the requirements of Sixth Semester, **Bachelor of Engineering in Computer Science and Engineering of Visvesvaraya Technological University, Belagavi** during the year 2018. It is certified that all corrections and suggestions indicated for the internal assessment have been incorporated in the report. This mini project report has been approved as it satisfies the academic requirements in respect to technical project work prescribed for the Bachelor of Engineering degree.

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Project Guide	**Project Guide**	**Head Of Department**
Prof. Padmavathi H G	**Prof. Soumyalatha**	**Dr. SasiKumar M**
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ABSTRACT

Dequeue is sometimes written dequeue, but this use is generally deprecated in technical literature or technical writing because dequeue is also a verb meaning "to remove from a queue". Nevertheless, several libraries and some writers, such as Aho, Hopcroft, and Ullmanin their textbook Data Structures and Algorithms, spell it dequeue. John Mitchell, author of Concepts in Programming Languages, also uses this terminology.

This differs from the queue abstract data type or first in first out list (FIFO), where elements can only be added to one end and removed from the other. This general data class has some possible sub-types:

An input-restricted deque is one where deletion can be made from both ends, but insertion can be made at one end only.

An output-restricted deque is one where insertion can be made at both ends, but deletion can be made from one end only.

Both the basic and most common list types in computing, queues and stacks can be considered specializations of deques, and can be implemented using deques.

There are at least two common ways to efficiently implement a deque: with a modified dynamic array or with a doubly linked list.

The dynamic array approach uses a variant of a dynamic array that can grow from both ends, sometimes called array deques. These array deques have all the properties of a dynamic array, such as constant-time random access, good locality of reference, and inefficient insertion/removal in the middle, with the addition of amortized constant-time insertion/removal at both ends, instead of just one end. Three common implementations include:

Storing deque contents in a circular buffer, and only resizing when the buffer becomes full. This decreases the frequency of resizings.

Allocating deque contents from the center of the underlying array, and resizing the underlying array when either end is reached. This approach may require more frequent resizings and waste more space, particularly when elements are only inserted at one end.

Storing contents in multiple smaller arrays, allocating additional arrays at the beginning or end as needed. Indexing is implemented by keeping a dynamic array containing pointers to each of the smaller arrays.

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