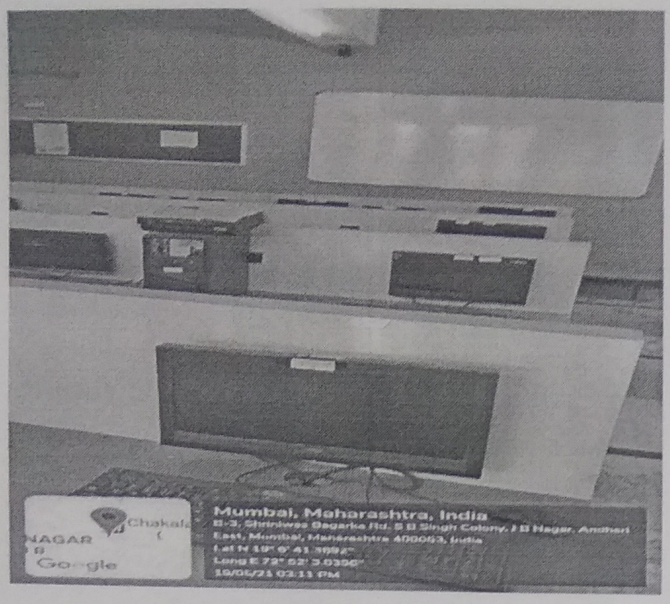
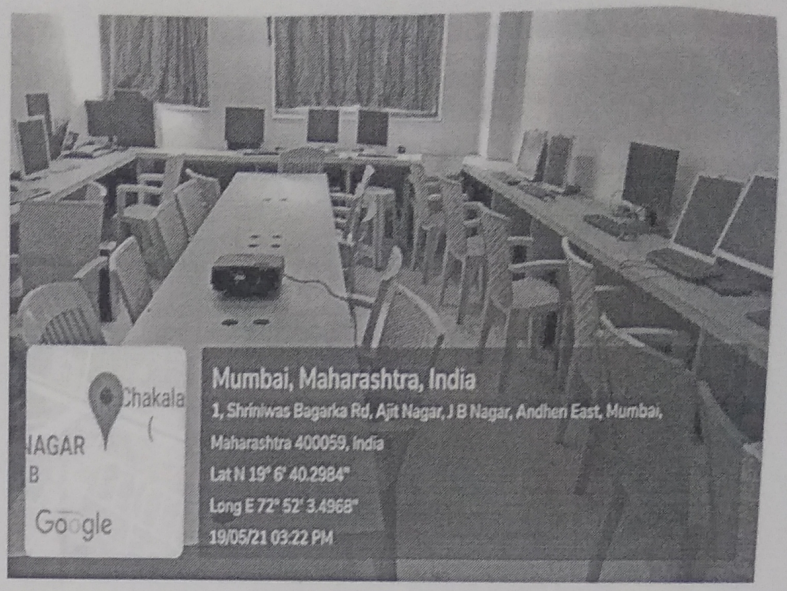
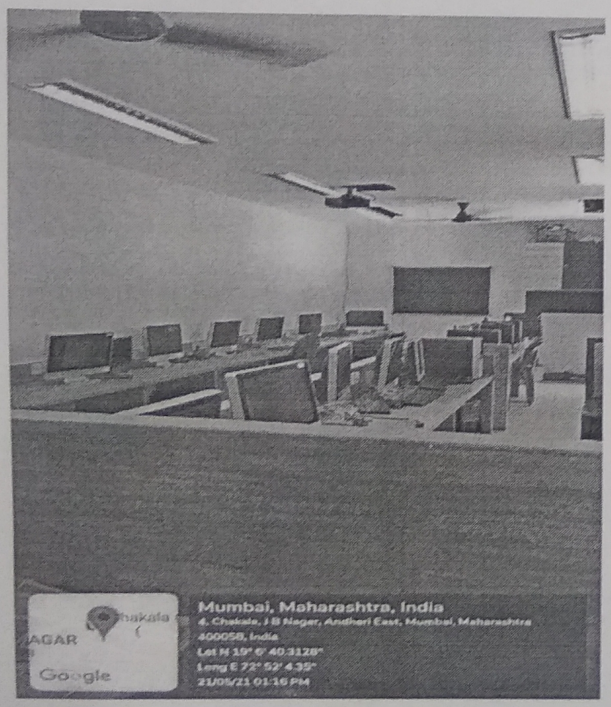
ICT Facilities At Institutions

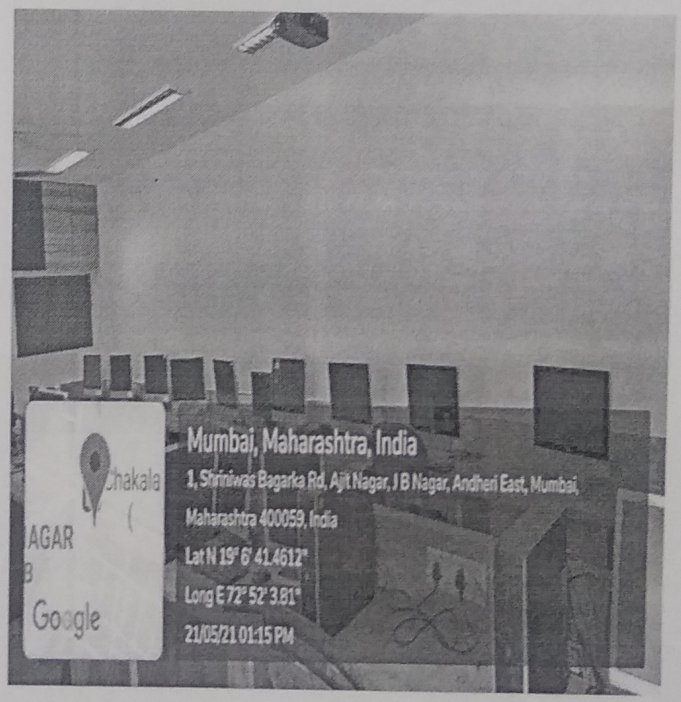




IT LAB 1



IT LAB 2



IT LAB 3

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IT LAB 4

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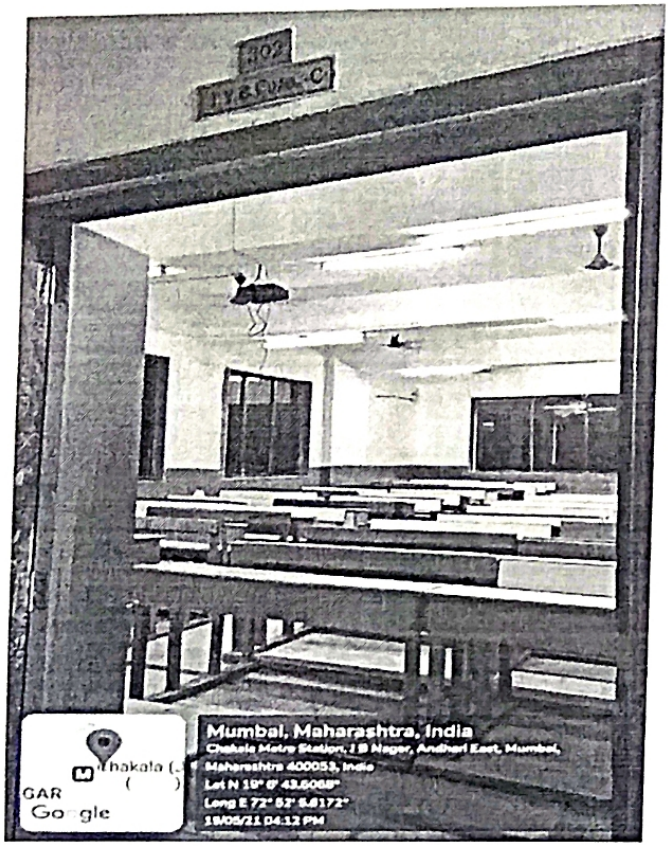
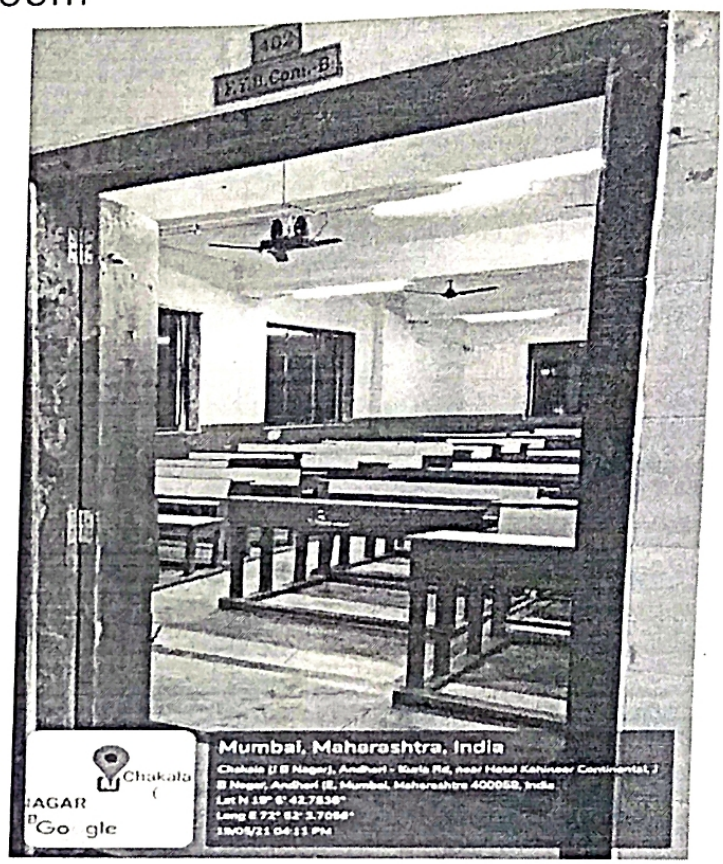
Class Room

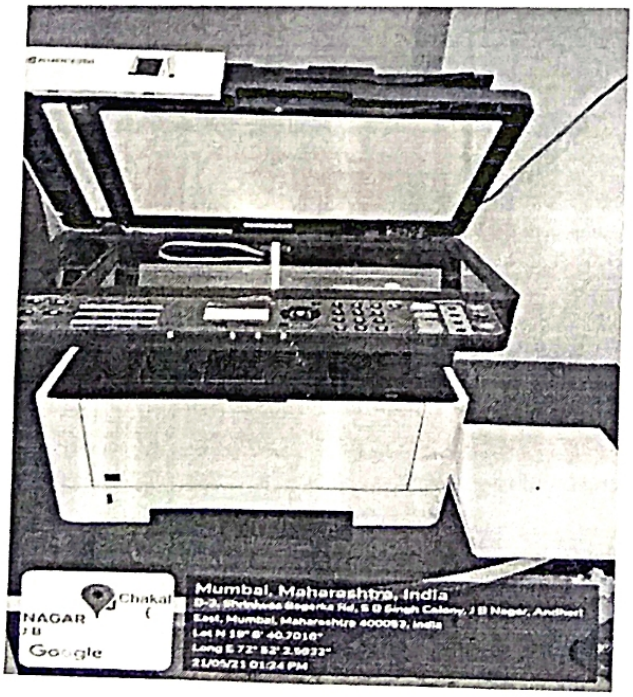


Class Room 302

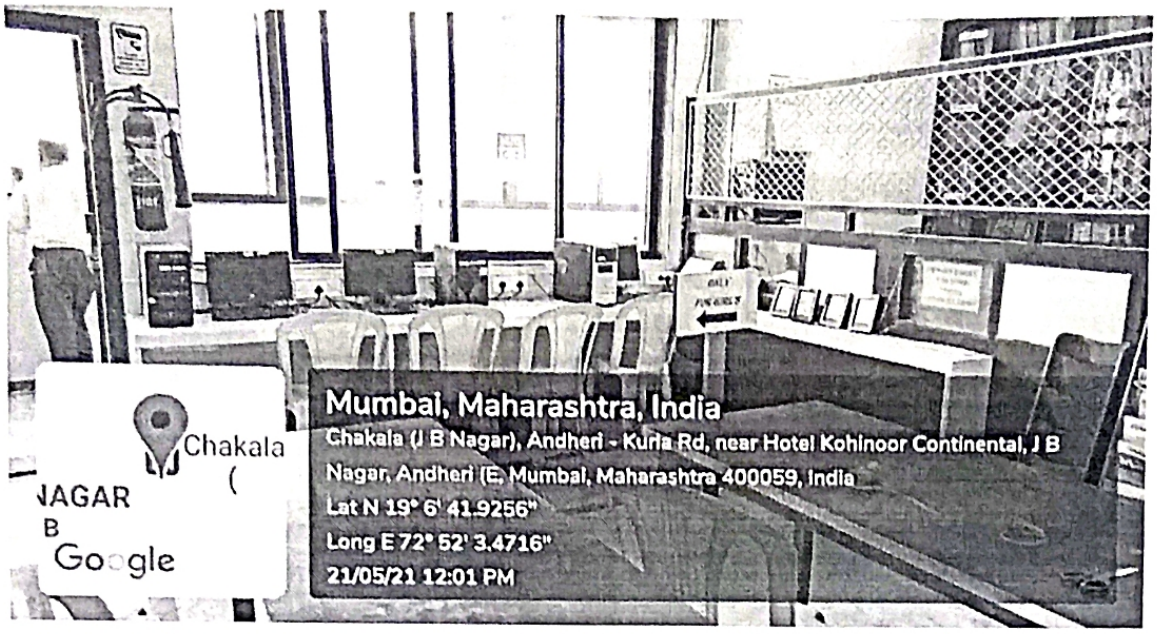


Class Room 402

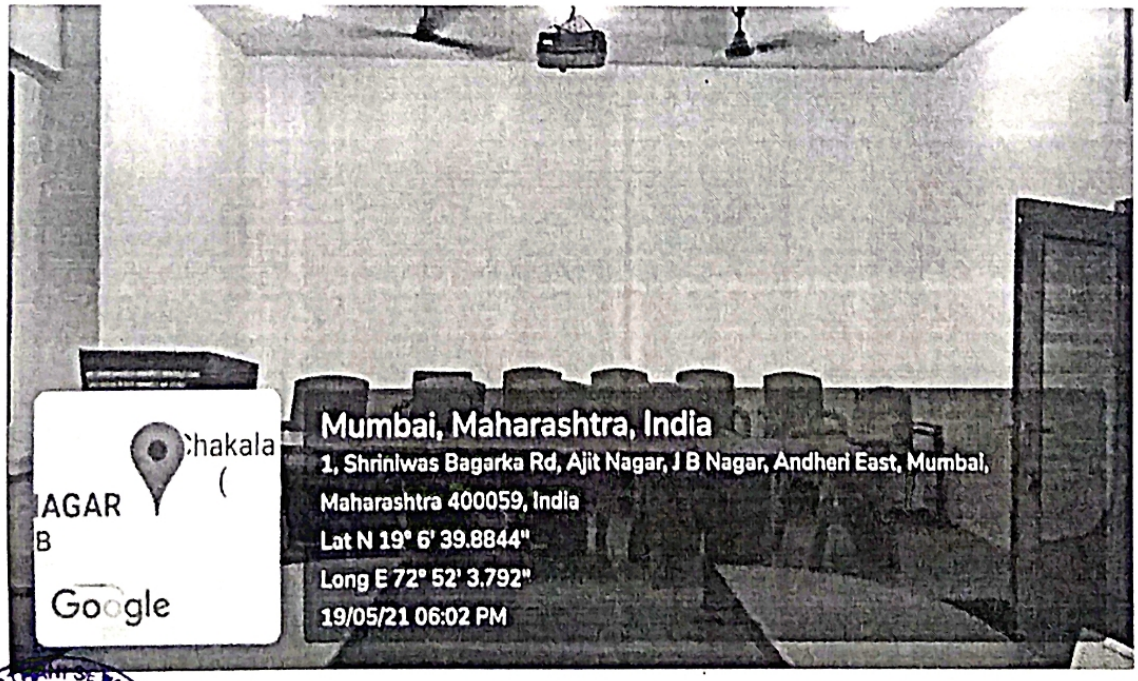
Xerox Machine



LIBRARY



SEMINAR HALL



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UNIT 3
STACKS & QUEUE

By
Mrs. Priya Maurya

STACK

WHAT Is stack?

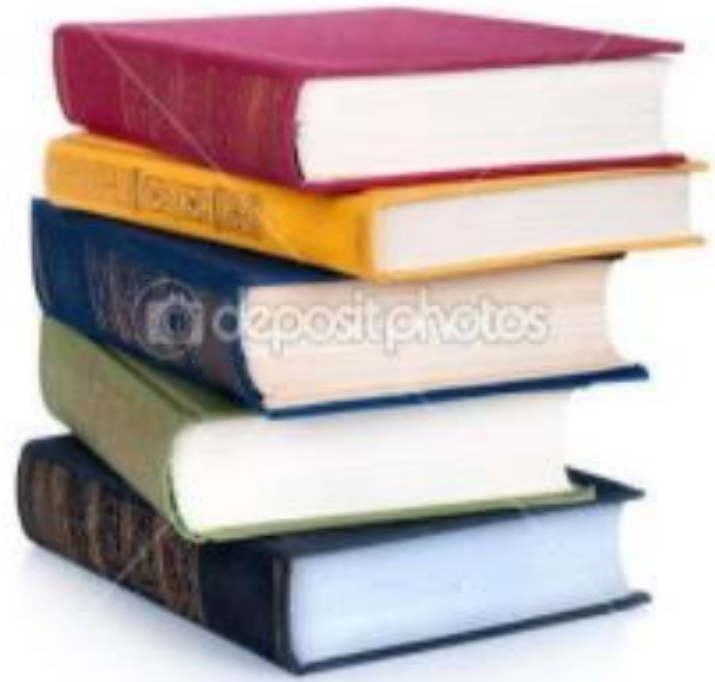
- A stack is called a last-in-first-out (LIFO) collection. This means that the last thing we added (pushed) is the first thing that gets pulled (popped) off.

- A stack is a sequence of items that are accessible at only one end of the sequence.


BE THE CHANGE
YOU WANT TO SEE
IN THE WORLD.
Mahatma Gandhi – Civil Rights Activist

EXAMPLES OF STACK

EXAMPLES OF STACK:



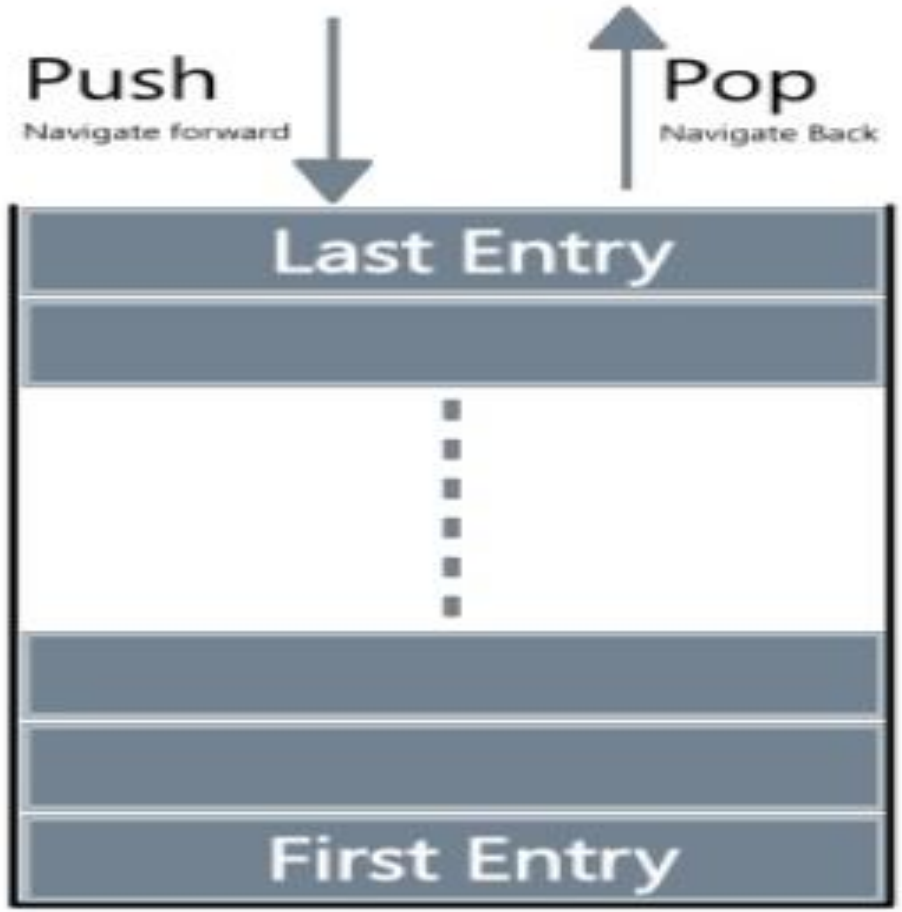
Stacks

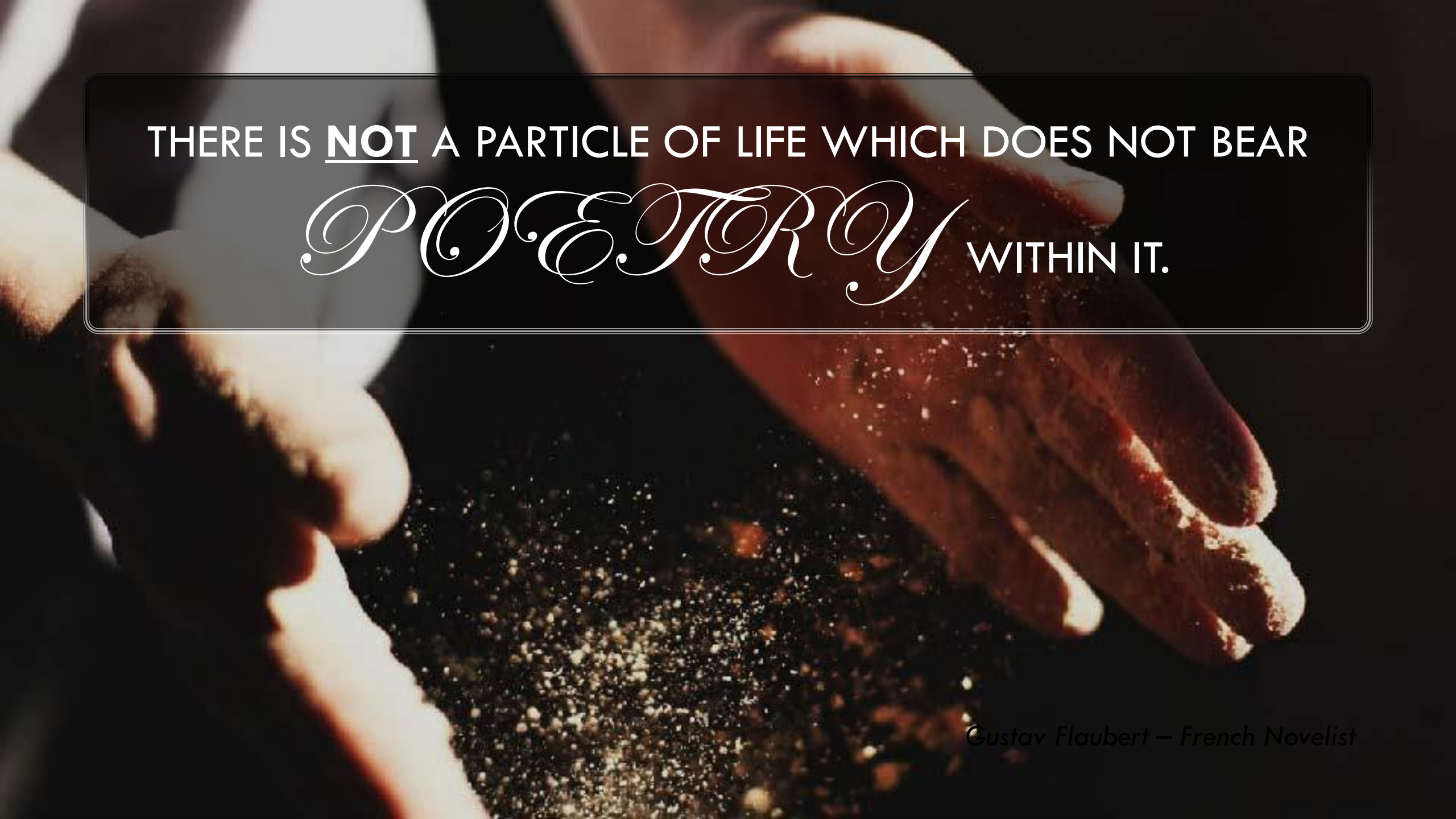
- Real Life Examples
- Shipment in a Cargo
- Plates on a tray
- Stack of Coins
- Stack of Drawers
- Shunting of Trains in Railway Yard
- Follows the Last-In First-Out (LIFO) strategy

OPERATIONS

Operations that can be performed on STACK:

- PUSH.
- POP.



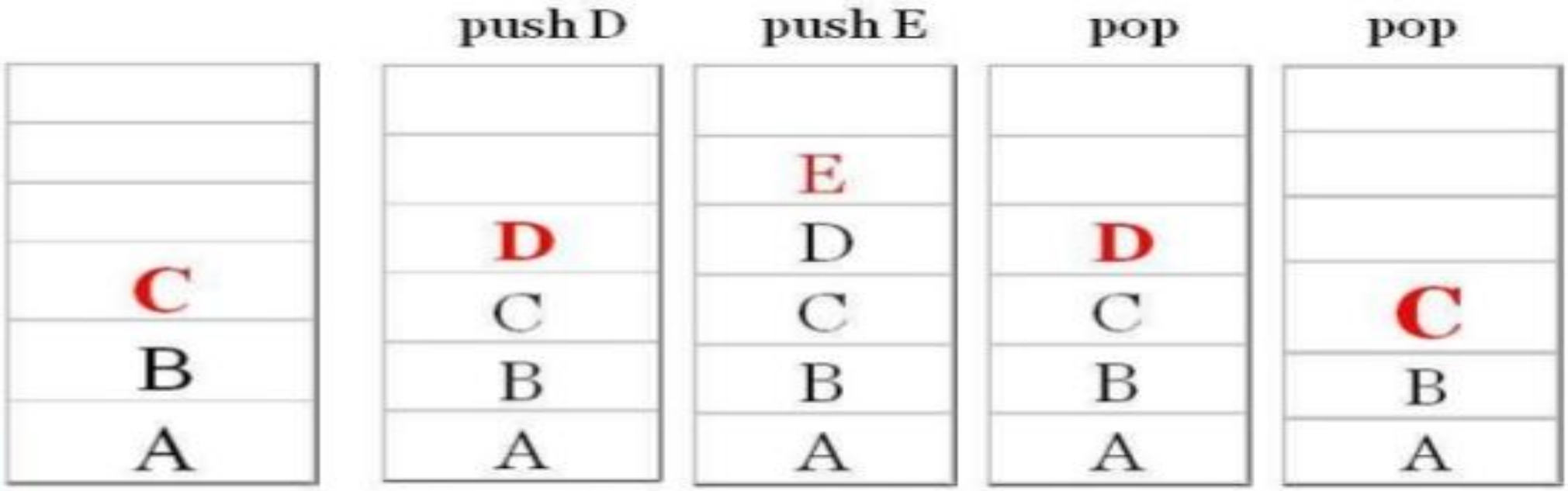

THERE IS NOT A PARTICLE OF LIFE WHICH DOES NOT BEAR
POETRY
WITHIN IT.
Gustav Flaubert – French Novelist

FORMAT

PUSH : It is used to insert items into the stack.

POP: It is used to delete items from stack.

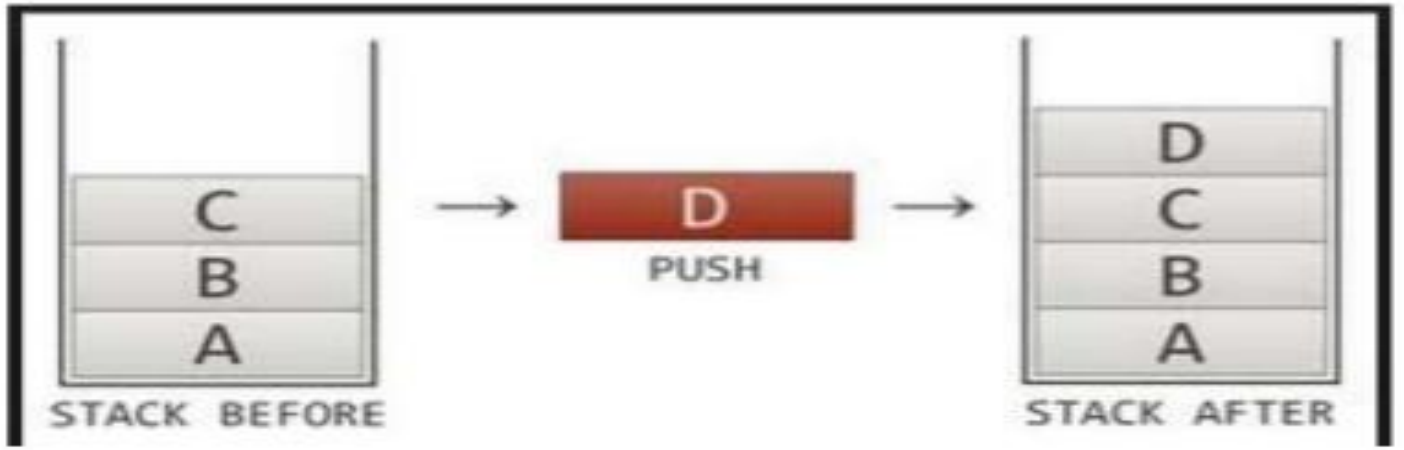
TOP: It represents the current location of data in stack.



ALGO PROCESS HOW IT WORKS?

ALGORITHM OF INSERTION IN STACK: (PUSH)

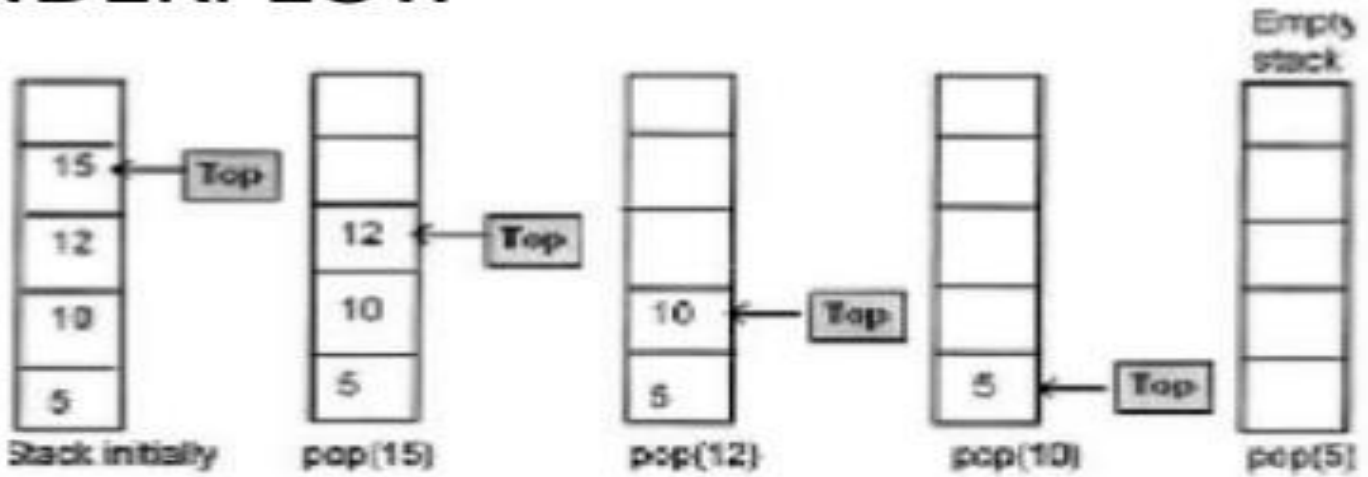
1. Insertion(a,top,item,max)
2. If top=max then
   print 'STACK OVERFLOW'
   exit
   else
3. top=top+1
   end if
4. a[top]=item
5. Exit



PROCESS HOW THE ALGO WORKS FOR DELETION OF STACK

ALGORITHM OF DELETION IN STACK: (POP)

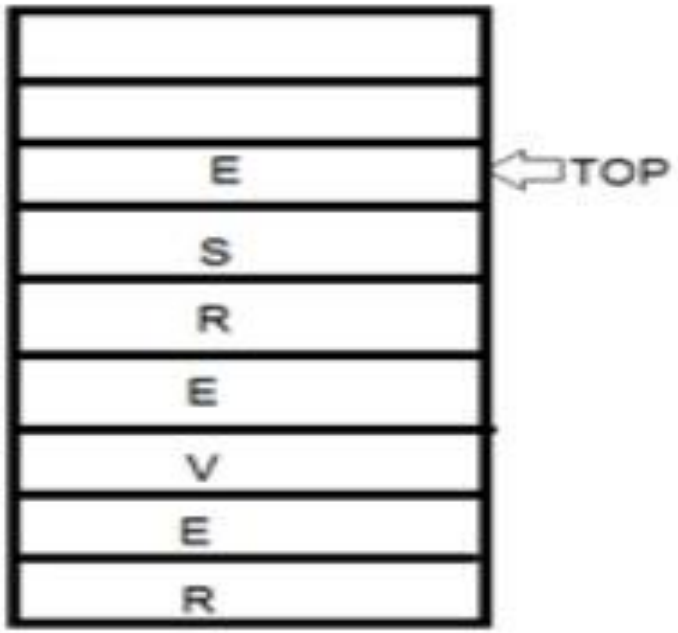
1. Deletion(a,top,item)
2. If top=0 then
   print 'STACK UNDERFLOW'
   exit
   else
3. item=a[top]
   end if
4. top=top-1
   Exit




WRITE
WHAT SHOULD NOT BE FORGOTTEN.
Isabel Allende – Chilean Author

ALGORITHM OF DISPLAY IN STACK:

1.Display(top,i,a[i])
2.If top=0 then
 Print 'STACK EMPTY'
 Exit
 Else
3.For i=top to 0
  Print a[i]
  End for
4.exit



APPLICATIONS

APPLICATIONS OF STACKS ARE:

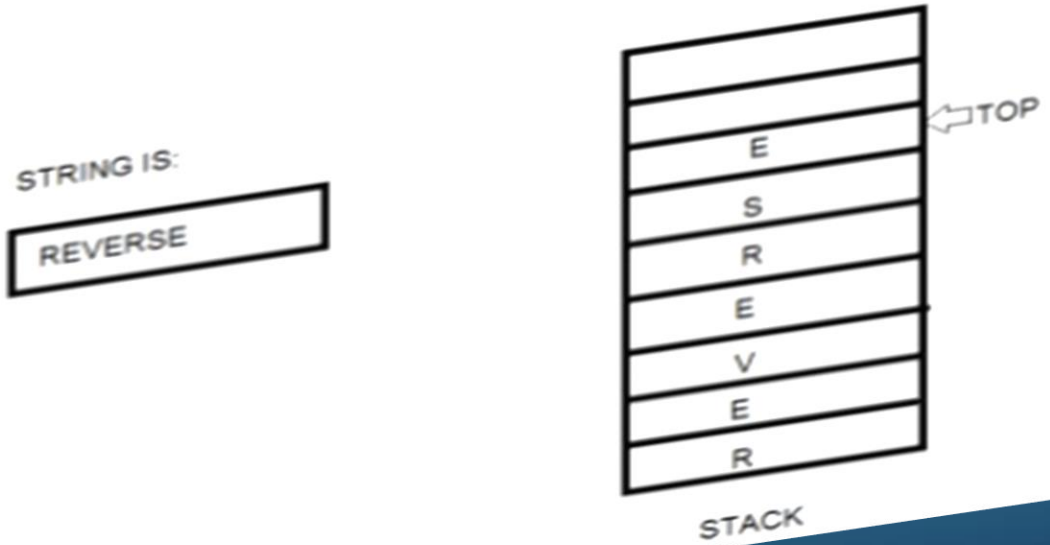
I. Reversing Strings:

- A simple application of stack is reversing strings. To reverse a string , the characters of string are pushed onto the stack one by one as the string is read from left to right.
- Once all the characters of string are pushed onto stack, they are popped one by one. Since the character last pushed in comes out first, subsequent pop operation results in the reversal of the string.

EXAMPLES

For example:

To reverse the string 'REVERSE' the string is read from left to right and its characters are pushed . LIKE:




SOMETIMES DREAMS
are wiser than waking.
Black Elk – Oglala Sioux Medicine Man

II. Checking the validity of an expression containing nested parenthesis:

- Stacks are also used to check whether a given arithmetic expressions containing nested parenthesis is properly parenthesized.
- The program for checking the validity of an expression verifies that for each left parenthesis braces or bracket ,there is a corresponding closing symbol and symbols are appropriately nested.

For example:

VALID INPUTS	INVALID INPUTS
{ } ({ [ ] }) { [ ] ( ) } [{ ({ } [ ] ({ })) }]	{ (} ([(( )]) { } [ ] [{) } ( ] }]

Alan Turing – British Computer Scientist

Infix to Postfix

A + B TO A B +

III. Evaluating arithmetic expressions:

INFIX notation:

The general way of writing arithmetic expressions is known as infix notation.

e.g, (a+b)

PREFIX notation:

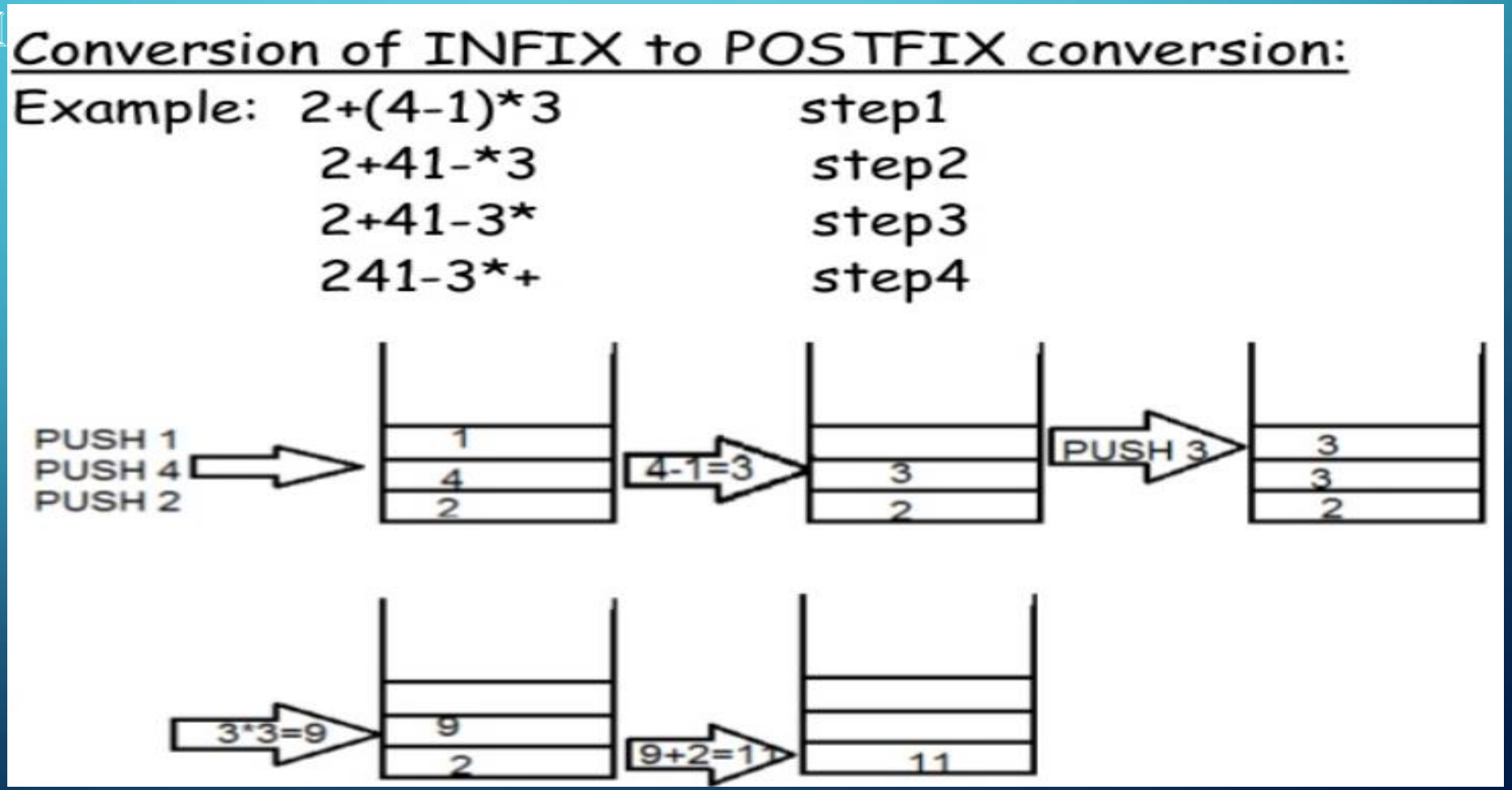
e.g, +AB

POSTFIX notation:

e.g: AB+

Infix Expression : A+B*(C^D-E)				
Token	**Action**	**Result**	**Stack**	**Notes**
A	Add **A** to the result	A		
+	Push **+** to stack	A	+	
B	Add **B** to the result	AB	+	
*	Push ***** to stack	AB	* +	* has higher precedence than +
(	Push **(** to stack	AB	(* +	
C	Add **C** to the result	ABC	(* +	
^	Push **^** to stack	ABC	^ (* +	
D	Add **D** to the result	ABCD	^ (* +	
-	Pop **^** from stack and add to result	ABCD^	(* +	- has lower precedence than ^
	Push - to stack	ABCD^	- (* +	
E	Add **E** to the result	ABCD^E	- (* +	
)	Pop - from stack and add to result	ABCD^E-	(* +	Do process until (is popped from stack
	Pop **(** from stack	ABCD^E-	* +	
	Pop * from stack and add to result	ABCD^E-*	+	Given expression is iterated, do Process till stack is not Empty, It will give the final result
	Pop + from stack and add to result	**ABCD^E-*+**		
Postfix Expression : ABCD^E-*+				

TO **CONVERT INFIX EXPRESSION** TO **POSTFIX EXPRESSION**, WE WILL **USE** THE STACK DATA STRUCTURE. BY SCANNING THE **INFIX EXPRESSION** FROM LEFT TO RIGHT, WHEN WE WILL GET ANY OPERAND, SIMPLY ADD THEM TO THE **POSTFIX** FORM, AND FOR THE OPERATOR AND PARENTHESIS, ADD THEM IN THE STACK MAINTAI



The infix expression is

$$(P/(Q-R)*S+T)$$

Symbol	Stack	Expression
(	(	—
P	(	P
/	(/	P
(	(/(	P
Q	(/(	PQ
—	(/(—	PQ
R	(/(—	PQR
)	(/	PQR—
*	(*	PQR—/
S	(*	PQR—/S
+	(+	PQR—/S*
T	(+	PQR—/S*T
)		PQR—/ST*+

So, the postfix expression is $PQR-/ST+*$.

CONVERSION OF INFIX INTO POSTFIX

2+(4-1)*3 into 241-3*+

CURRENT SYMBOL	ACTION PERFORMED	STACK STATUS	POSTFIX EXPRESSION
(	PUSH C	C	2
2			2
+	PUSH +	(+	2
(	PUSH (	(+(	24
4			24
–	PUSH –	(+(–	241
1	POP		241–
)		**(+**	**241–**
*	PUSH *	(+*	241–
3			241–3
	POP *		241–3*
	POP +		241–3*+
)			

Introduction to Queues

Queue ADT

Queue - First-In-First-Out
(FIFO)

Stack - Last-In-First-Out
(LIFO)


IF YOU CAN'T FLY, THEN **RUN**.
IF YOU CAN'T RUN, THEN **WALK**.
IF YOU CAN'T WALK, THEN **CRAWL**.
BUT WHATEVER YOU DO,
YOU HAVE TO KEEP MOVING.
Martin Luther King, Jr. – Civil Rights Activist and Pastor

QUEUES CONCEPT

Queues

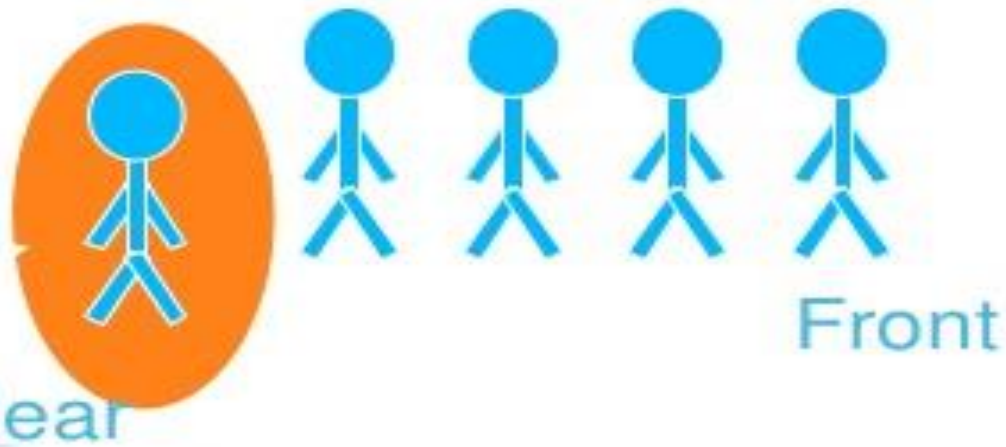
- Queue is an ADT data structure similar to stack, except that the first item to be inserted is the first one to be removed.
- This mechanism is called First-In-First-Out (FIFO).
- Placing an item in a queue is called “insertion or enqueue”, which is done at the end of the queue called “rear”.
- Removing an item from a queue is called “deletion or dequeue”, which is done at the other end of the queue called “front”.
- Some of the applications are : printer queue, keystroke queue, etc.

Operations On A Queue

1. To insert an element in queue
2. Delete an element from queue

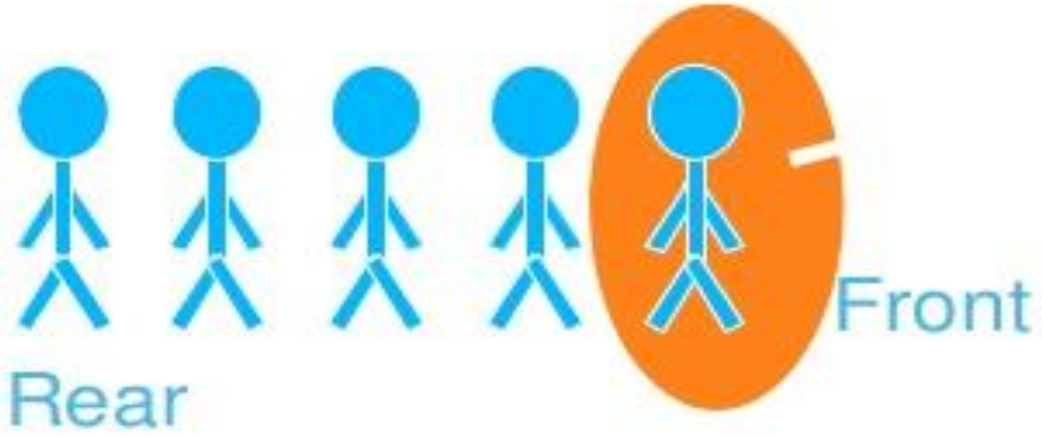
The Queue Operation

Placing an item in a queue is called "insertion or enqueue", which is done at the end of the queue called "rear".



The Queue Operation

Removing an item from a queue is called "deletion or dequeue", which is done at the other end of the queue called "front".



Algorithm QINSERT (ITEM)

1. If (rear = maxsize-1)
   print ("queue overflow") and return
2. Else
   rear = rear + 1
   Queue [rear] = item

Algorithm QDELETE ()

1. If (front =rear)

   print "queue empty" and return

2. Else

   Front = front + 1

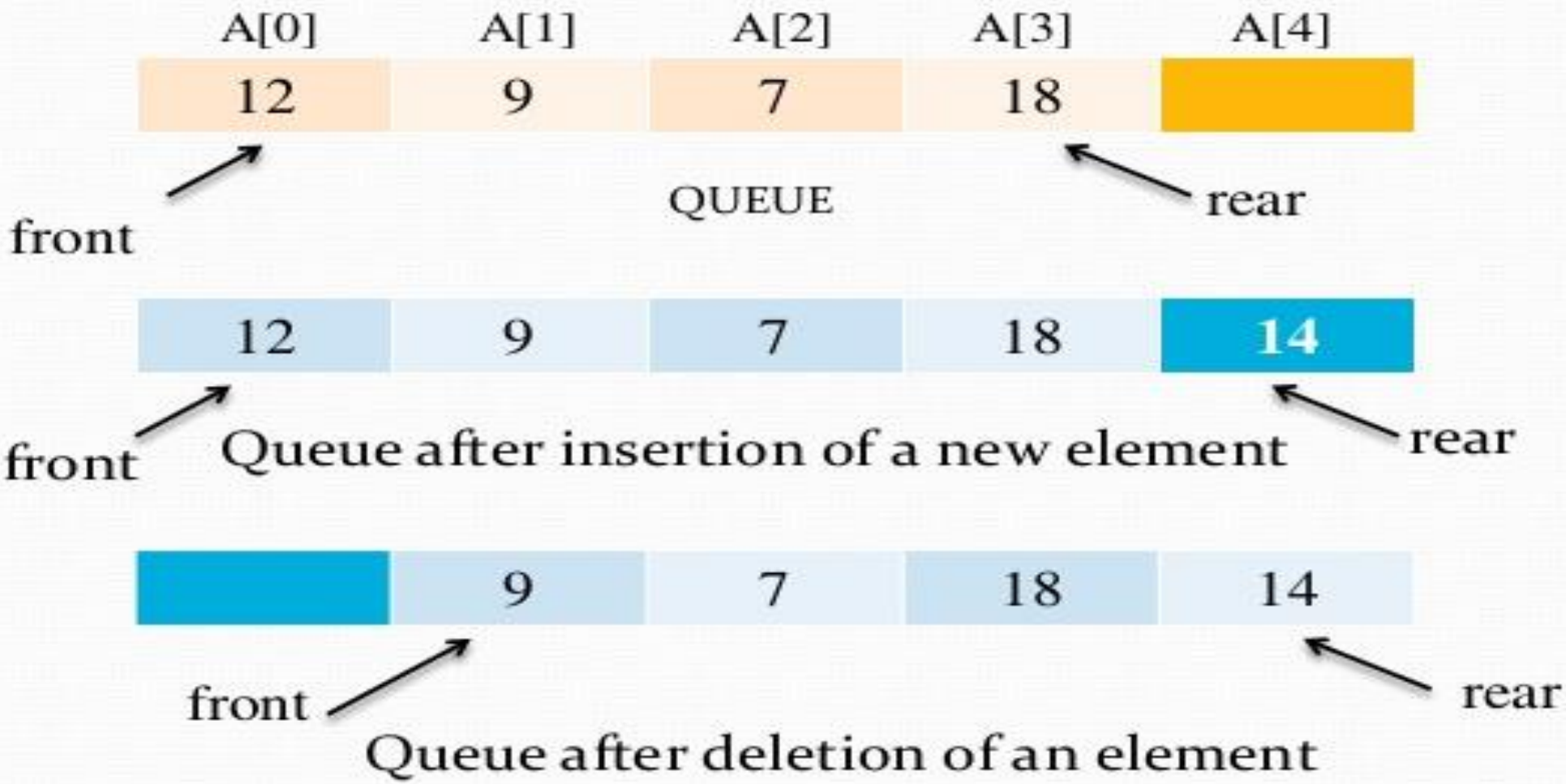
   item = queue [front];

   Return item

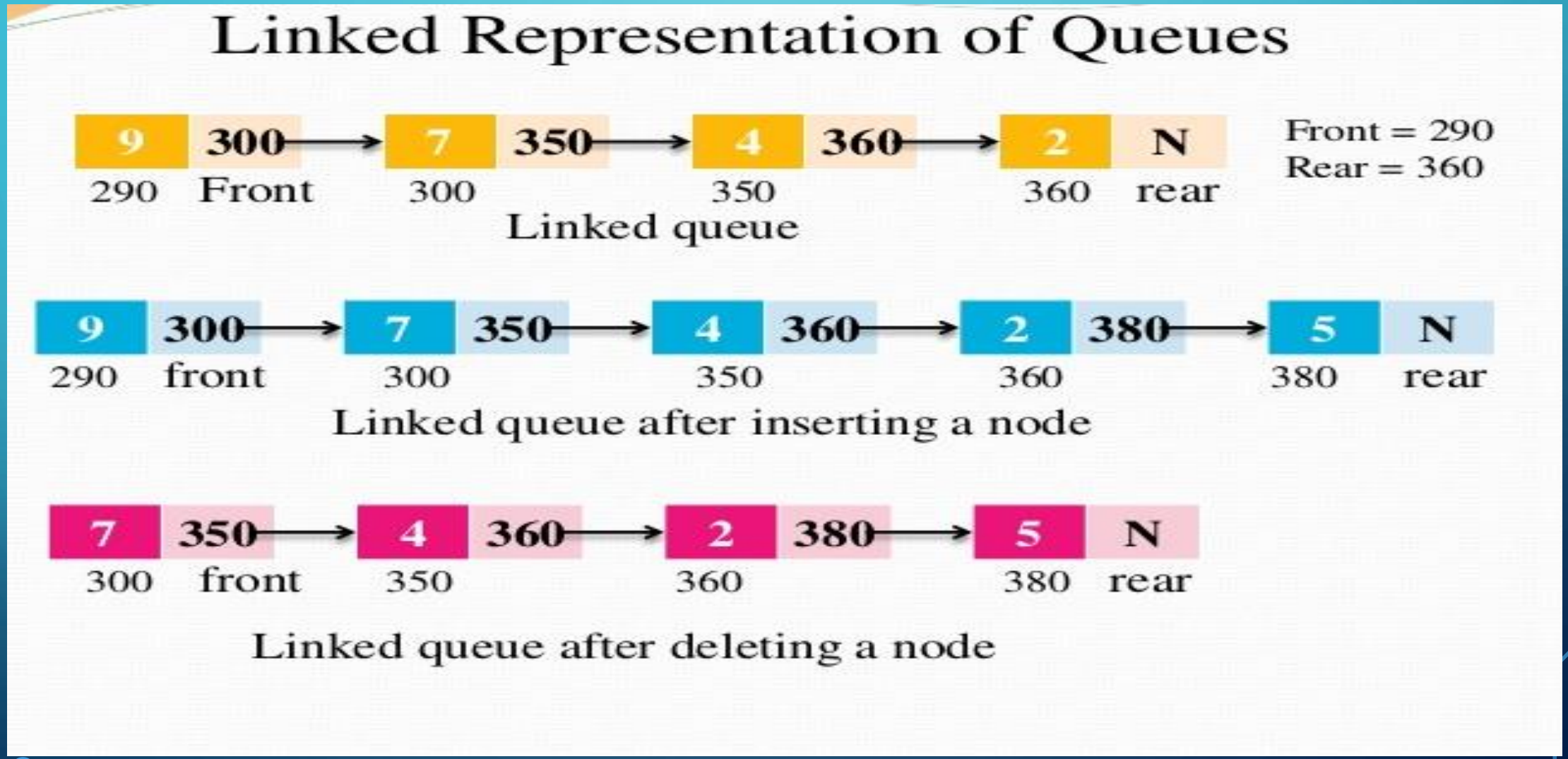
Representation Of Queues

1. Using an array
2. Using linked list

Array Representation of Queues



LINKED REPRESENTATION OF QUEUES



Various Queues

- Normal queue (FIFO)
- Circular Queue (Normal Queue)
- Double-ended Queue (Deque)
- Priority Queue

3 states of the queue

1. Queue is empty

   FRONT=REAR

2. Queue is full

   REAR=N

3. Queue contains element >=1

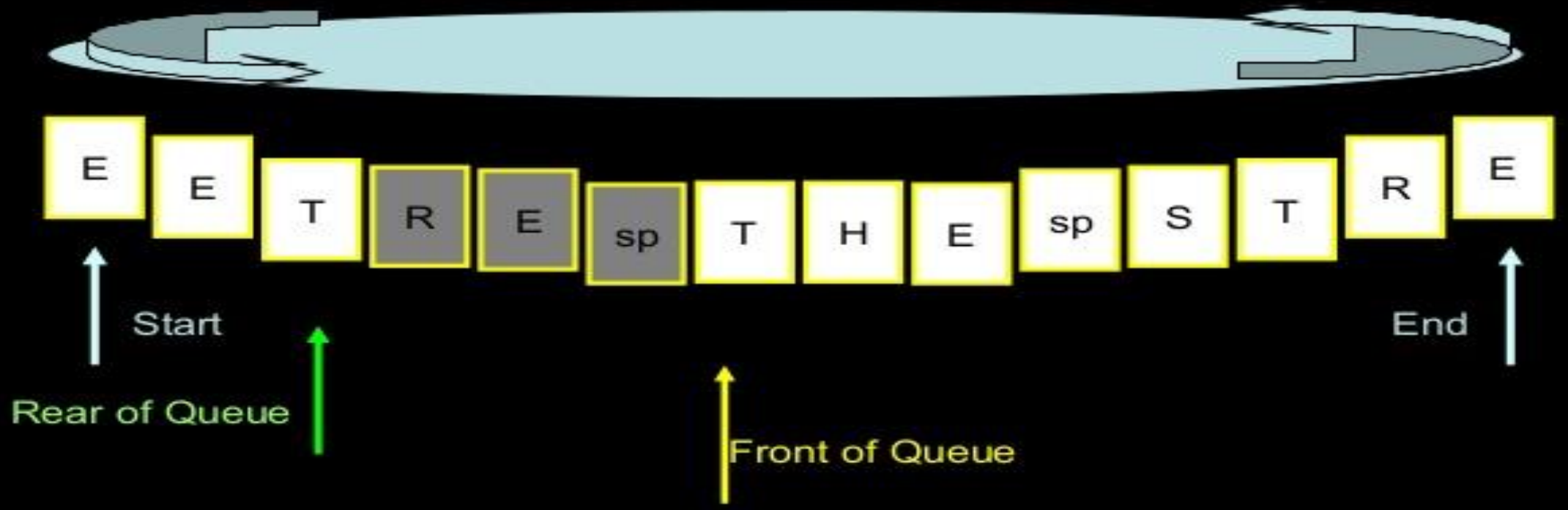
   FRONT<REAR

   NO. OF ELEMENT=REAR-FRONT+1

Circular Queue

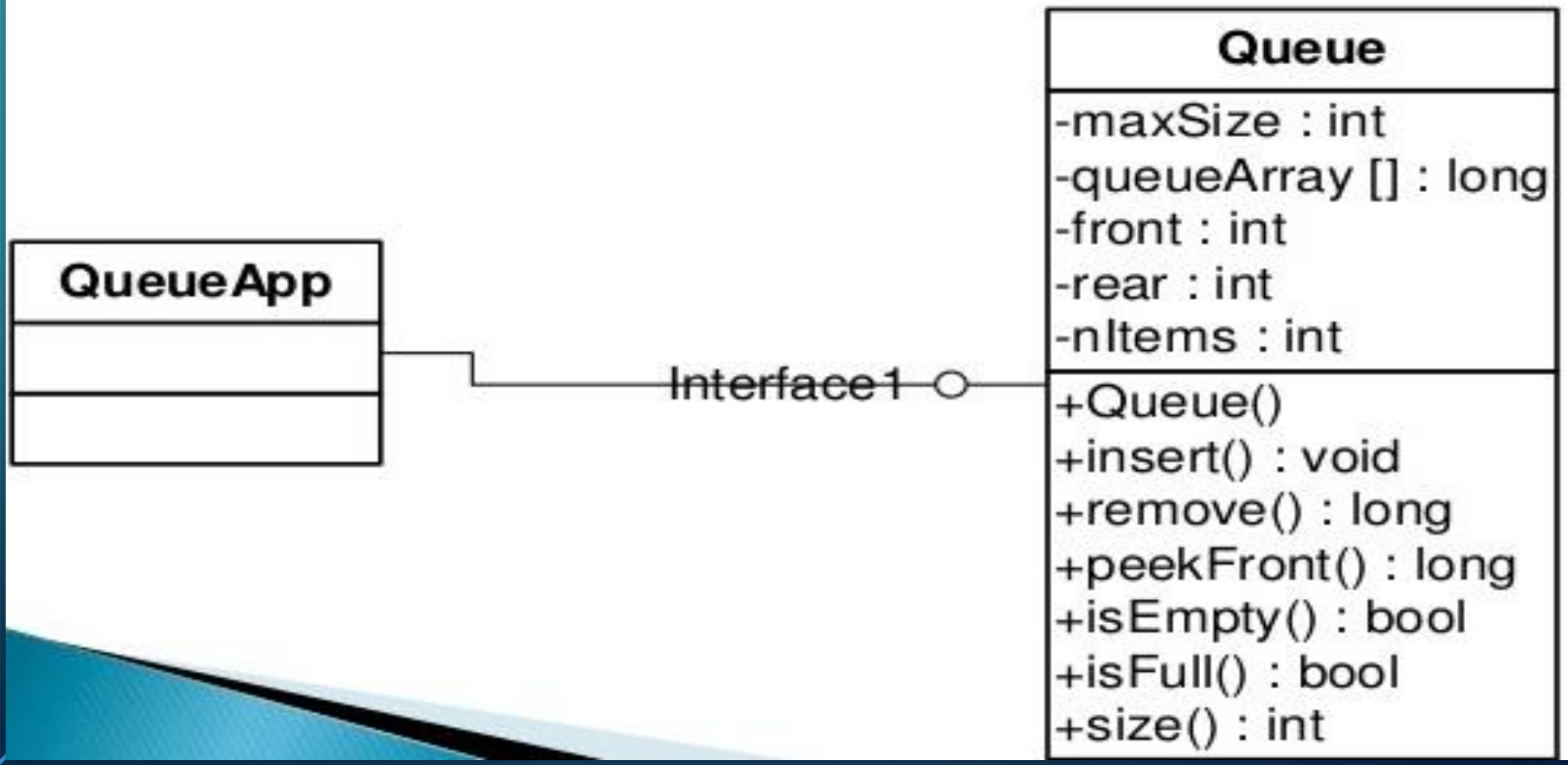
- To solve this problem, queues implement wrapping around. Such queues are called Circular Queues.
- Both the front and the rear pointers wrap around to the beginning of the array.
- It is also called as “Ring buffer”.
- Items can inserted and deleted from a queue in O(1) time.

Circular queue



- It's not really a circle!

Queue Example



Deque

- It is a double-ended queue.
- Items can be inserted and deleted from either ends.
- More versatile data structure than stack or queue.
- E.g. policy-based application (e.g. low priority go to the end, high go to the front)
- In a case where you want to sort the queue once in a while, What sorting algorithm will you use?

Types Of Deque

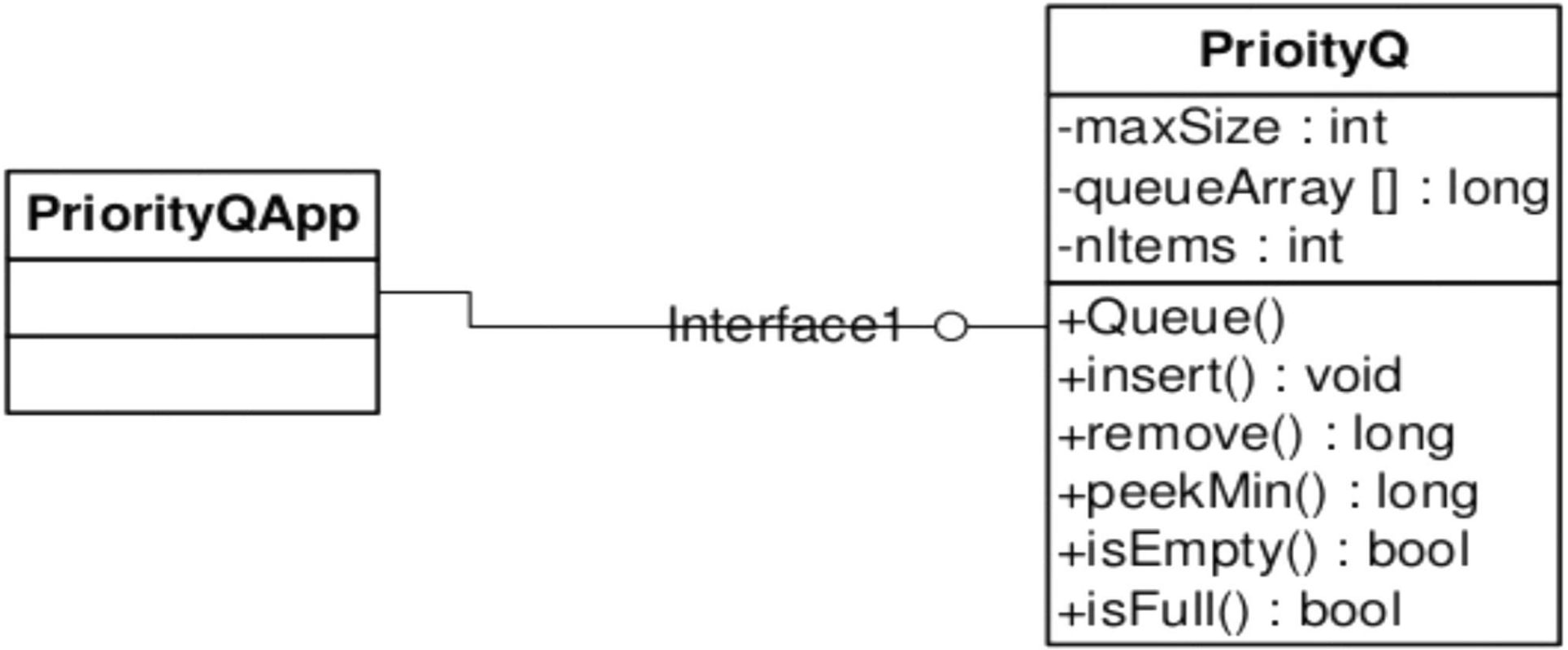
1.Input restricted deque:

2. Output restricted deque:

Priority Queues

- More specialized data structure.
- Similar to Queue, having front and rear.
- Items are removed from the front.
- Items are ordered by key value so that the item with the lowest key (or highest) is always at the front.
- Items are inserted in proper position to maintain the order.
- Let's discuss complexity

Priority Queue Example



Priority Queues

- Used in multitasking operating system.
- They are generally represented using “heap” data structure.
- Insertion runs in O(n) time, deletion in O(1) time.

Parsing Arithmetic Expressions

- 2 + 3
- 2 + 4 * 5
- ((2 + 4) * 7) + 3* (9 – 5))

- 2 3 +
- 2 4 5 * +
- 2 4 + 7 * 3 9 5 - * +

- Infix vs postfix
- Why do we want to do this transformation?

Infix to postfix

- Read ch from input until empty
  - If ch is arg , output = output + arg
  - If ch is "(", push '(';
  - If ch is op and higher than top push ch
  - If ch is ")" or end of input,
    - output = output + pop() until empty or top is "("
  - Read next input

Postfix eval

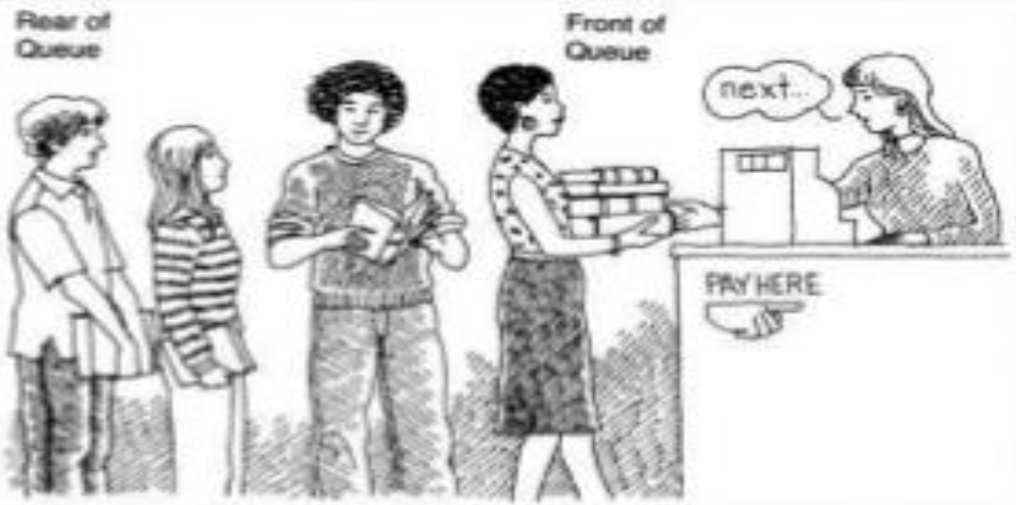
- 5 + 2 * 3 -> 5 2 3 * +
- Algorithm
  - While input is not empty
  - If ch is number , push (ch)
  - Else
    - Pop (a)
    - Pop(b)
    - Eval (ch, a, b)

Queue Applications

- Real life examples
  - ✓Waiting in line
  - ✓Waiting on hold for tech support
- Applications related to Computer Science
  - ✓Round robin scheduling
  - ✓Job scheduling (FIFO Scheduling)
  - ✓Key board buffer

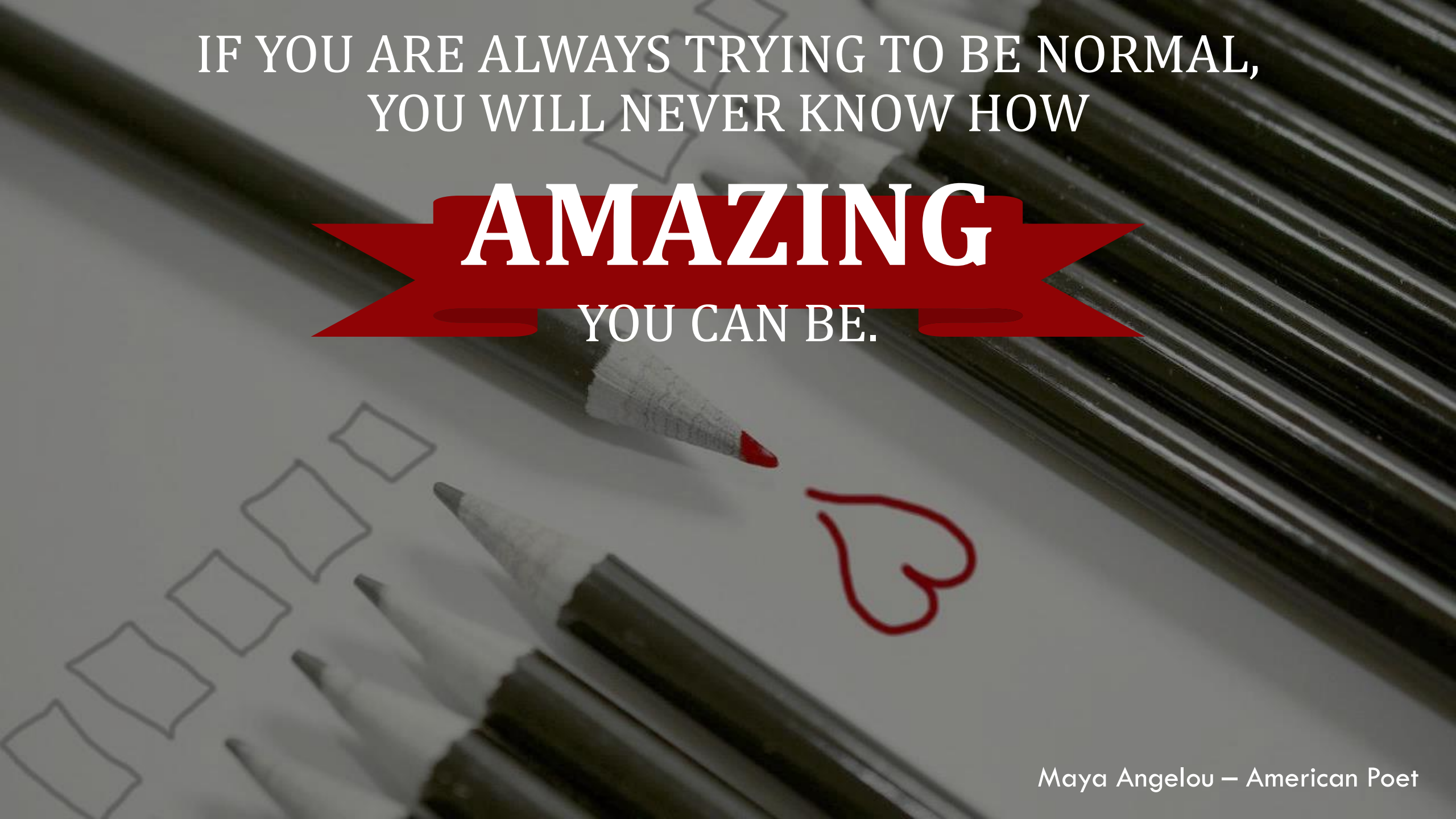
APPLICATIONS

- Real world applications
  - Cashier line in any store.
  - Waiting on hold for tech support.
  - people on an escalator.
  - Checkout at any book store.



❖Applications related to computer science:

1. When data is transferred asynchronously between two processes. eg. IO Buffers.
2. When a resource is shared among multiple consumers. Examples include CPU scheduling, Disk Scheduling.
3. In recognizing palindrome.
4. In shared resources management.
5. Keyboard buffer.
6. Round robin scheduling.
7. Job scheduling.
8. Simulation


IF YOU ARE ALWAYS TRYING TO BE NORMAL,
YOU WILL NEVER KNOW HOW
AMAZING
YOU CAN BE.
Maya Angelou – American Poet


THANK
YOU

SPECIAL ROLES OF MASS MEDIA IN INDIA

DR. NANDA INDULKAR

PRINT MEDIA AS AN INTERPRETER & WATCHDOG

- PROVIDE INFORMATION
- REVEAL ABUSE OF STATE AUTHORITY
- ALERTING OTHER WHEN AN ANOMALY IS DETECTED
- FACT-CHECKING
- INFORMATION GATHERING
- MAKE PEOPLE MORE AWARE

PRINT MEDIA AS AN INTERPRETER & WATCHDOG

- ENABLE PEOPLE TO HAVE ACCESS TO GOVERNMENT
- EDUCATE PEOPLE
- DRAW ATTENTION
- FOSTER EXCHANGE OF BEST PRACTICES
- CREATE PRESSURE FOR IMPROVED GOVERNMENT PERFORMANCE
- PROVIDE DISCURSIVE SPACE FOR CITIZENS

CHANGING DIMENSION

- AVOID ALL DISTORTIONS & ALL MANIPULATIONS OF MESSAGES
- MUST NOT USE ILLICIT MEAN TO OBTAIN INFORMATION
- MAINTAIN THE STANDARD OF ACCURACY
- TO HOLD PUBLIC OFFICIALS ACCOUNTABLE

RADIO AS PATRON OF MUSIC

- AKASHVANI
- VADYA VRINDA UNIT
- AKASHVANI SANGEET SAMMELAN
- THAYGARAJA ARADHANA MUSIC FESTIVAL
- TRINITY & OTHER VAGGEYAKARA FESTIVAL
- FOLK & LIGHT MUSIC FESTIVAL
- AUDITION SYSTEM
- FOUR GRADES – B , BHIGH, A & TOP AWARDED TO ARTISTE
- TOP GRADE WESTERN MUSIC ARTISTE
- AKASHVANI SANGEET

TELEVISION & CONSUMERISM

- RISE IN NUMBER OF CHANNELS
- COMMERCIALISATION OF INDIAN TV
- SHIFT TOWARDS MARKET DRIVEN ECONOMY
- SUPPRESSES INDIAN REALITY

FILMS VOICING SOCIAL PROBLEMS

- SOCIAL COMMENTARY
- RESPONSIBLE FOR SOCIAL CHANGES
- INDIOM OF PROTEST

SOCIAL NETWORKING SITES & MASS CAMPAIGNS

- TOOLS TO INFLUENCE PEOPLE
- INTERACTIVE
- PROVIDES LATERNAL COMMUNICATION
- INTRODUCES RESISTANCE CULTURE
- AVAILABLE TO GREATER NUMBER OF PEOPLE
- EASY RESPONSIBILITY

SOCIAL BENEFITS OF SOCIAL NETWORKING SITES

- POLITICAL CAMPAIGNS
- ANTI CORRUPTION CAMPAIGNS
- PUBLIC HEALTH CAMPAIGNS