SNS COLLEGE OF TECHNOLOGY

Coimbatore-35

An Autonomous Institution

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A+' Grade

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

COURSE NAME : 23ITT201 DATA STRUCTURES

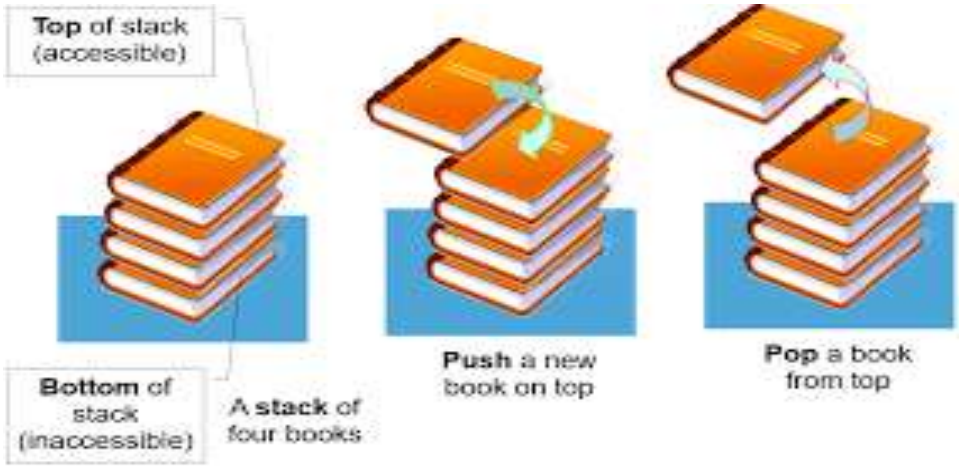
II YEAR/ III SEMESTER

UNIT – II STACKS AND QUEUES

Topic: Linked List implementation of Stack ADT

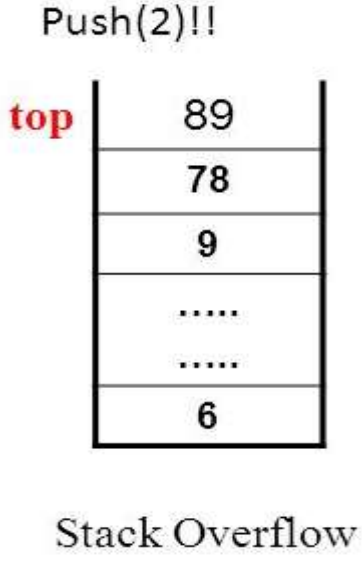
Stack ADT

- Linear Data Structure
- Elements are arranged in sequential
- Follows LIFO-Last In First Out mechanism
- Example-Plates in tray
- Arranging the coins ,Books
- Push-Inserting the element into the stack
- Pop-Deleting the element from the stack



Implemented in two ways
Using Arrays
Using Linked List

Stack



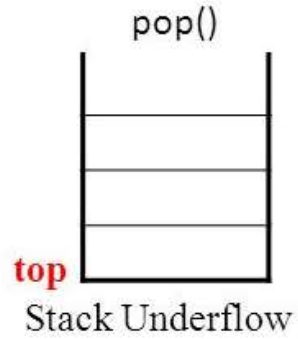
Stack Overflow

Overflow condition(push)

- Stack-5 elements
- Insert 6 th element
- Inserting an element to the stack which is already having maximum elements

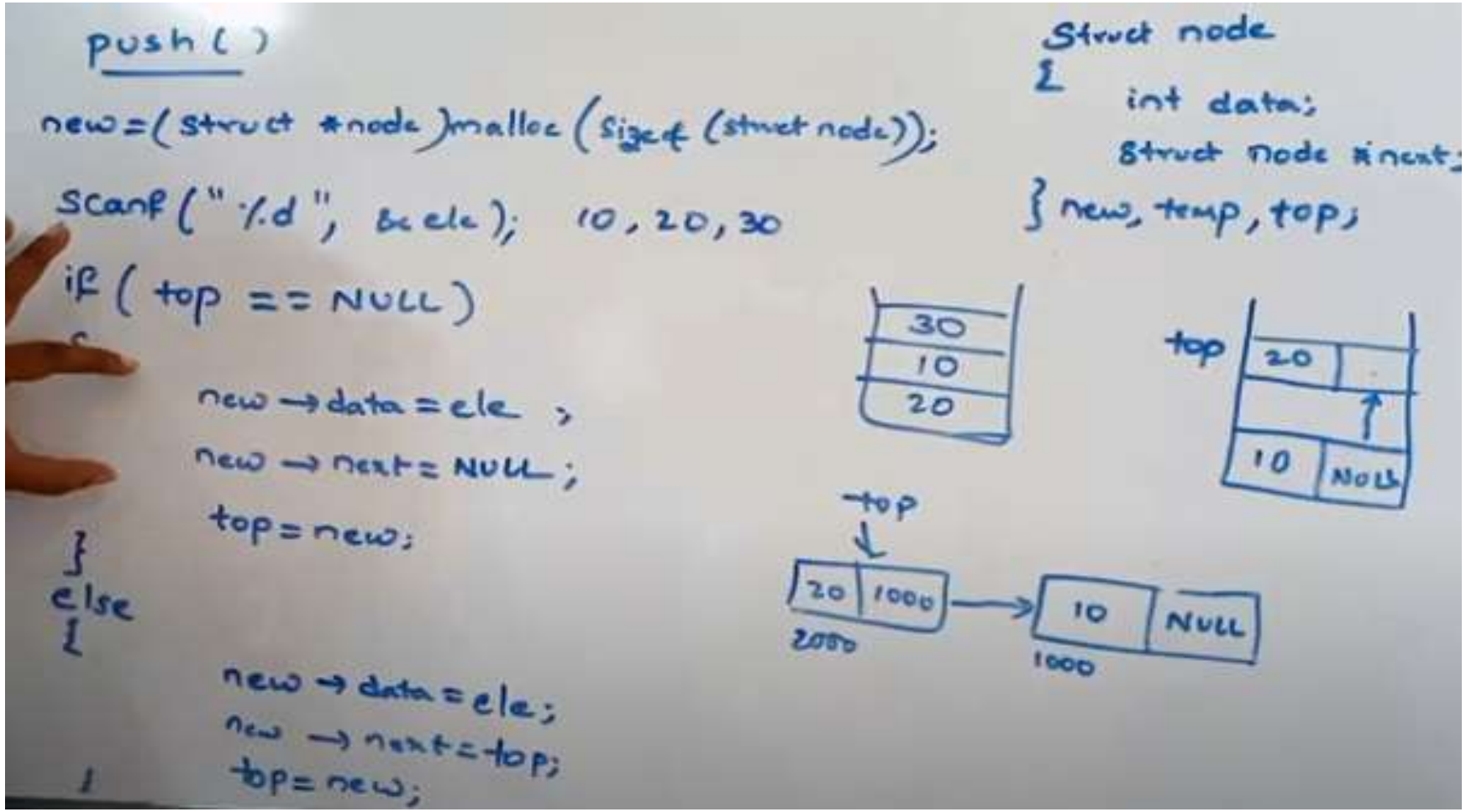
Underflow Condition

Deleting an element from the empty stack

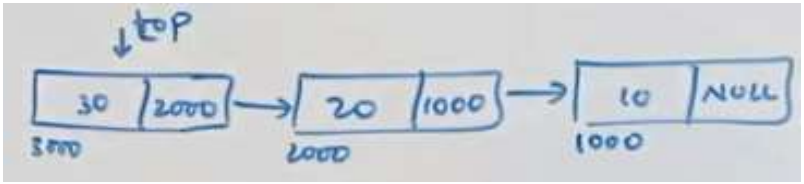


Stack Underflow

Implementation of Stack Using Linked list



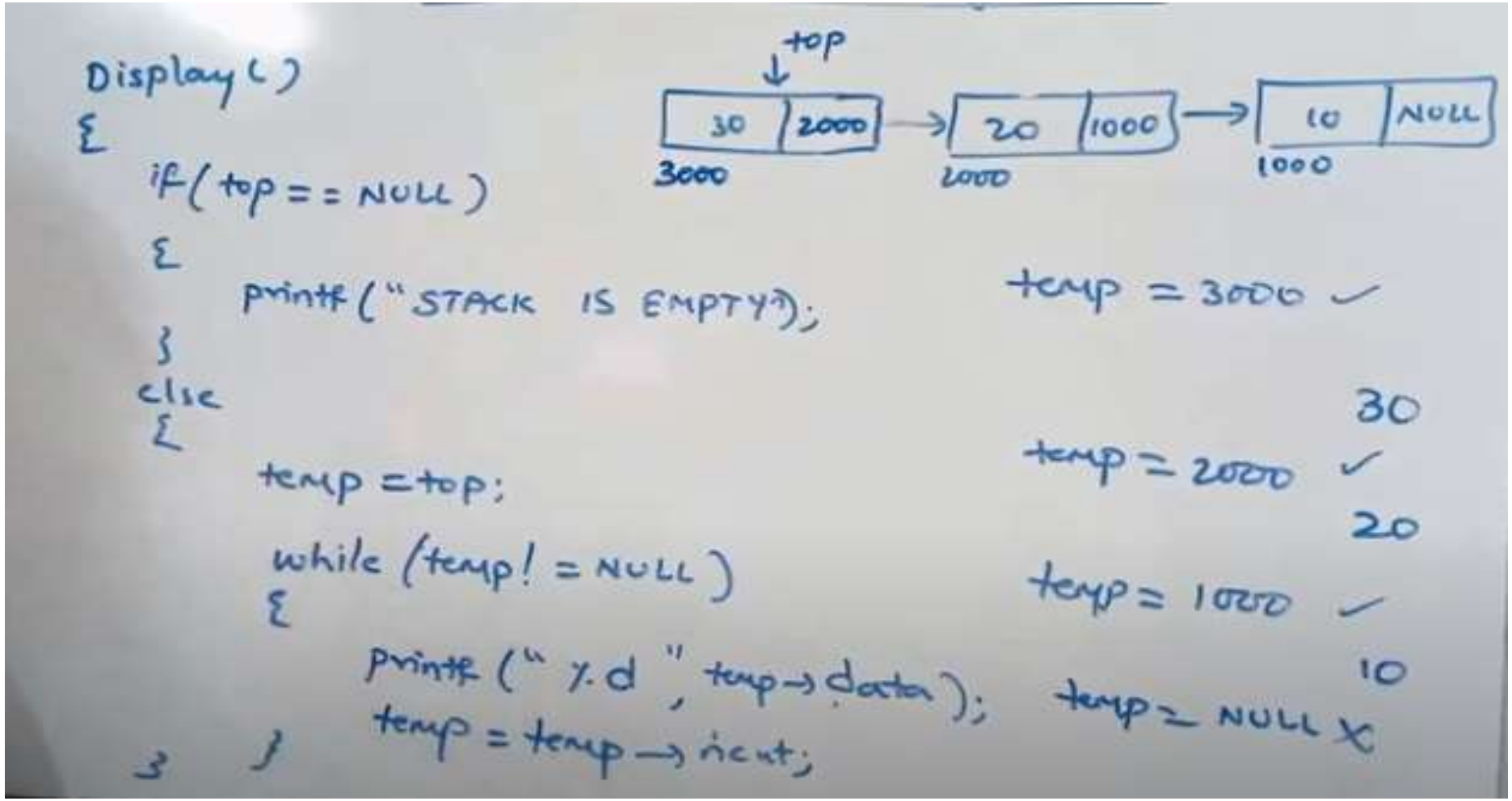
Implementation of Stack Using Linked list




```
pop()
if (top == NULL)
{
    printf("STACK IS EMPTY");
}
else
{
    temp = top;
    ele = top->data; printf("%d is deleted", top->data);
    top = top->next;
    temp->next = NULL
    free(temp);
}
```

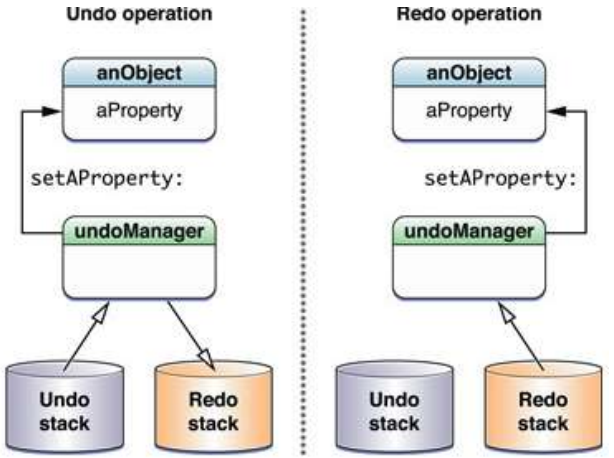
Implementation of Stack Using Linked list

Display Function



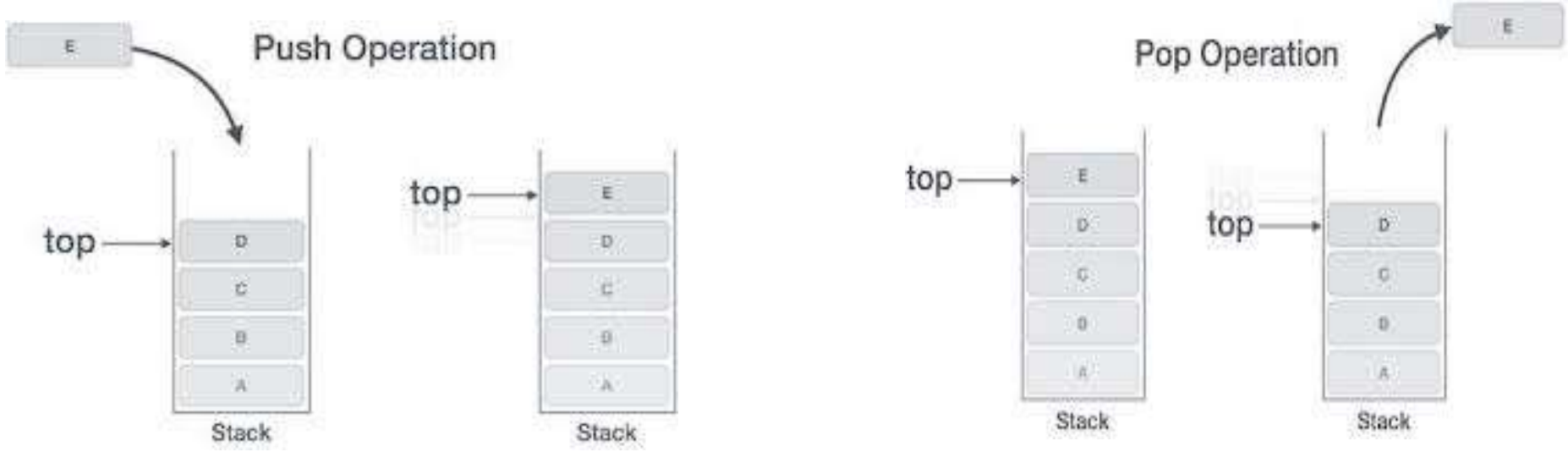
Applications of Stack

- **Evaluating arithmetic Expression**
  - **Infix to Postfix Conversion**
  - **Evaluating the Postfix Expression**
- Balancing the Symbols
- Undo/Redo
- Reverse a string
- Towers of Hanoi
- Function calls
- 8 Queen Problem



Assessment

1.How to do Push and POP Operations



2.Tell any two applications of Stack

References

1. M. A. Weiss, “Data Structures and Algorithm Analysis in C”, Pearson Education, 2nd Edition, 2002.
2. A. V. Aho, J. E. Hopcroft and J. D. Ullman, “Data Structures and Algorithms”, Pearson Education, 2nd Edition, 2007
3. Ashok Kamthane, " Data Structures Using C ", Pearson Education, 2nd Edition, 2012.
4. Sahni Horowitz, “Fundamentals of Data Structures in C”Universities Press; Second edition 2008

Thank You