



SNS COLLEGE OF ENGINEERING

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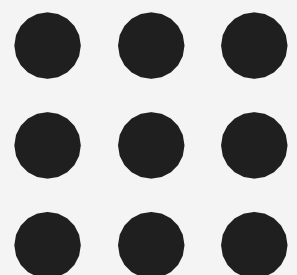
Department of Artificial Intelligence and Data Science

Course Name: 23ITB201 Data structures and Algorithms

II Year / III semester

Unit II – Stack and Queue ADT

Topic: Balanced Parenthesis





Balanced Parenthesis



- Given an expression containing only ‘(, ’)’, ’{, ’}’, ‘[, ’]’, check whether the expression is balanced or not.
- An expression is balanced if each opening bracket is closed by the same type of closing bracket in the exact same order.
- Approach – Check for Balanced Brackets in an Expression using Stack



Balanced Parenthesis



Steps

- Traverse the expression string exp.
- If the current character is a starting bracket ('(' or '{' or '[') then push it to stack.
- If the current character is a closing bracket (')' or '}' or ']') then pop from stack and if the popped character is the matching starting bracket then fine else brackets are not balanced.
- After complete traversal, if there is some starting bracket left in stack then “NOT BALANCED”



Balanced Parenthesis



Input: “({[]})”

| Stack | Expression | Action |
|-------|------------|--------|
| | ({[]}) | Push |
| (| {[]}) | Push |
| { | []) | Push |
| {{ | []) | Pop |
| { |) | Pop |
| (|) | Pop |
| Empty | | |

As the stack is empty, hence the given expression was balanced.



Applications of Stack

