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1: // Iterative Queue based C program
2: // to do Level order traversal
3: // of Binary Tree
4: #include <stdio.h>
5: #include <stdlib.h>
6: #define MAX_Q_SIZE 500
7:
8: /* A binary tree node has data,
9: pointer to left child
10: and a pointer to right child */
11: struct node {
12:     int data;
13:     struct node* left;
14:     struct node* right;
15: };
16:
17: /* function prototypes */
18: struct node** createQueue(int*, int*);
19: void enqueue(struct node**, int*, struct node*);
20: struct node* dequeue(struct node**, int*);
21:
22: /* Given a binary tree, print its nodes in Level order
23: using array for implementing queue */
24: void printLevelOrder(struct node* root)
25: {
26:     int rear, front;
27:     struct node** queue = createQueue(&front, &rear);
28:     struct node* temp_node = root;
29:
30:     while (temp_node) {
31:         printf("%d ", temp_node->data);
32:
33:         /*Enqueue left child */
34:         if (temp_node->left)
35:             enqueue(queue, &rear, temp_node->left);
36:
37:         /*Enqueue right child */
38:         if (temp_node->right)
39:             enqueue(queue, &rear, temp_node->right);

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40:
41:         /*Dequeue node and make it temp_node*/
42:         temp_node = dequeue(queue, &front);
43:     }
44: }
45:
46: /*UTILITY FUNCTIONS*/
47: struct node** createQueue(int* front, int* rear)
48: {
49:     struct node** queue = (struct node**)malloc(
50:         sizeof(struct node*) * MAX_Q_SIZE);
51:
52:     *front = *rear = 0;
53:     return queue;
54: }
55:
56: void enqueue(struct node** queue, int* rear,
57:             struct node* new_node)
58: {
59:     queue[*rear] = new_node;
60:     (*rear)++;
61: }
62:
63: struct node* dequeue(struct node** queue, int* front)
64: {
65:     (*front)++;
66:     return queue[*front - 1];
67: }
68:
69: /* Helper function that allocates a new node with the
70: given data and NULL left and right pointers. */
71: struct node* newNode(int data)
72: {
73:     struct node* node
74:         = (struct node*)malloc(sizeof(struct node));
75:     node->data = data;
76:     node->left = NULL;
77:     node->right = NULL;
78:

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79:     return (node);
80: }
81:
82: /* Driver program to test above functions*/
83: int main()
84: {
85:     struct node* root = newNode(1);
86:     root->left = newNode(2);
87:     root->right = newNode(3);
88:     root->left->left = newNode(4);
89:     root->left->right = newNode(5);
90:
91:     printf("Level Order traversal of binary tree is \n");
92:     printLevelOrder(root);
93:
94:     return 0;
95: }
96:
```