

Lab Evaluation – II

Advanced Data Structures (CAP770)

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Question:

Program to implement queue to print vowels from list of characters using linked representation.

Code:

```
G++ CA2.cpp distCA-RCAC2.cpp
#include <iostream>
using namespace std;

class Node {
public:
    char data;
    Node* next;
};

class Queue {
private:
    Node* front;
    Node* rear;
public:
    Queue() {
        front = NULL;
        rear = NULL;
    }

    bool isEmpty() {
        return (front == NULL && rear == NULL);
    }

    void enqueue(char x) {
        Node* temp = new Node();
        temp->data = x;
        temp->next = NULL;
        if (isEmpty()) {
            front = rear = temp;
            return;
        }
        rear->next = temp;
        rear = temp;
    }

    char dequeue() {
        if (isEmpty()) {
            throw "Queue is empty.";
        }
        Node* temp = front;
        char x = temp->data;
        if (front == rear) {
            front = rear = NULL;
        } else {
            front = front->next;
        }
        delete temp;
        return x;
    }
};

int main() {
    Queue q;
    int count = 0, index = 1;
    string str;
    char choice;

    do {
        cout << "Enter the location of the string: ";
        cin >> index;
        cin.ignore();
        cout << "Enter the string: ";
        getline(cin, str);

        try {
            for (int i = 0; i < str.length(); i++) {
                if (str[i] != ' ' && (str[i] == 'a' || str[i] == 'e' || str[i] == 'i' || str[i] == 'o' || str[i] == 'u' || str[i] == 'A' || str[i] == 'E' || str[i] == 'I' || str[i] == 'O' || str[i] == 'U')) {
                    q.enqueue(str[i]);
                    count++;
                    cout << "Vowel " << count << " is " << str[i] << " at index " << i+1 << endl;
                }
            }
            if (count == 0) {
                cout << "No vowels found in the string." << endl;
            } else {
                cout << "Vowels in the string (in order): ";
                while (!q.isEmpty()) {
                    cout << q.dequeue() << " ";
                }
                cout << endl;
            }
        } catch (const char* msg) {
            cerr << "Error: " << msg << endl;
            cout << "Do you want to try again? (y/n): ";
            cin >> choice;
        }
    } while (choice == 'y' || choice == 'Y');

    return 0;
}
```

Output:

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL SQL CONSOLE COMMENTS
Enter the location of the string: 5
Enter the string: abcdefghijklmnopqrstuvwxyz
Vowel 1 is 'a' at index 1
Vowel 2 is 'e' at index 5
Vowel 3 is 'i' at index 9
Vowel 4 is 'o' at index 14
Vowel 5 is 'u' at index 20
Vowels in the string (in order): e i o u
PS C:\Users\nohit\Documents\ds\dsa\CA-11\output> []
```

Repository:

<https://github.com/kotarohts/ADVANCED-DATA-STRUCTURES.git>

