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Program : BsCs 3-1

Question : 1

```cpp
#include <iostream>
using namespace std;

class Queue {
private:
    int front, rear, capacity;
    string* data;

public:
    Queue(int capacity = 100) : capacity(capacity), front(0), rear(0) {
        data = new string[capacity];
    }

    ~Queue() {
        delete[] data;
    }

    void enqueue(const string& element) {
        if ((rear + 1) % capacity == front) {
            cout << "Error: Queue overflow!" << endl;
            return;
        }
        data[rear] = element;
        rear = (rear + 1) % capacity;
    }

    string dequeue() {
        if (front == rear) {
```

```cpp
            cout << "Error: Queue underflow!" << endl;
            return "";
        }
        string element = data[front];
        front = (front + 1) % capacity;
        return element;
    }


    void display() {
        for (int i = front; i != rear; i = (i + 1) % capacity) {
            cout << data[i] << " ";
        }
        cout << endl;
    }
};

int main() {
    Queue q;
    q.enqueue("Lemon");
    q.enqueue("Cucumber ");
    q.enqueue("Carrot");
    q.display();

    cout << "Dequeued: " << q.dequeue() << endl;
    cout << "Dequeued: " << q.dequeue() << endl;
    q.display();

    return 0;
}
```

```
Lemon Cucumber   Carrot
Dequeued:  Lemon
Dequeued:  Cucumber
Carrot
```

Question : 2

```cpp
#include <iostream>
#include <vector>
using namespace std;

int main() {
    string input;
    cout << "Enter a string: ";
    getline(cin, input);

    vector<string> queue;
    string word;

    for (int i = 0; i < input.length(); i++) {
        if (input[i] == ' ') {
            queue.push_back("Q" + to_string(i + 1) + "-" + word);
            word.clear();
        } else {
            word += input[i];
        }
    }

    queue.push_back("Q" + to_string(input.length()) + "-" + word);

    cout << "Concatenated queue: ";
```

```cpp
    for (const auto& str : queue) {
        cout << str << " ";
    }
    cout << endl;

    return 0;
}
```

```
Enter a string: i am rehan
Concatenated queue: Q2-i Q5-am Q10-rehan
```