Lab Assignment: 3.

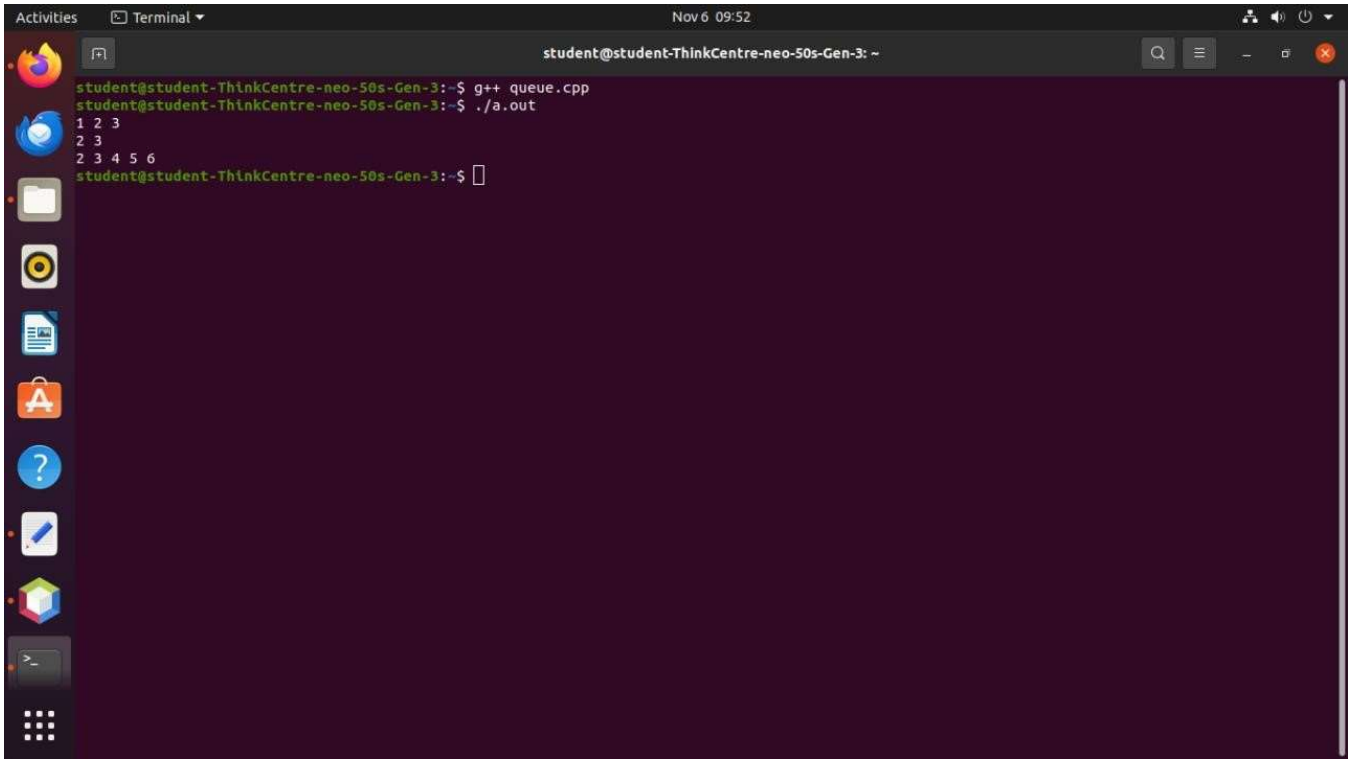
3. Circular Queue:

- **Source Code:**

```
#include <iostream>

#define MAX_SIZE 5

class CircularQueue { private:
   int front, rear;
   int queue[MAX_SIZE];

public:
   CircularQueue() {
front = -1;        rear = -1;
   }

   // Function to check if the queue is empty     bool
isEmpty() {
      return (front == -1 && rear == -1);
   }

   // Function to check if the queue is full     bool
isFull() {
      return (front == (rear + 1) % MAX_SIZE);
   }

   // Function to enqueue (insert) an element     void
enqueue(int data) {        if (isFull()) {
         std::cout << "Queue is full. Cannot enqueue." << std::endl;           return;
      } else if (isEmpty()) {           front =
rear = 0;
      } else {
         rear = (rear + 1) % MAX_SIZE;
      }
```

```
        queue[rear] = data;

    }


    // Function to dequeue (remove) an element     void
dequeue() {        if (isEmpty()) {

            std::cout << "Queue is empty. Cannot dequeue." << std::endl;            return;

        } else if (front == rear) {            front =
rear = -1;

        } else {

            front = (front + 1) % MAX_SIZE;

        }

    }


    // Function to display the elements in the queue     void
display() {        if (isEmpty()) {

            std::cout << "Queue is empty." << std::endl;            return;

        }

         int i = front;        while (i != rear) {
std::cout << queue[i] << " ";

            i = (i + 1) % MAX_SIZE;

        }

        std::cout << queue[rear] << std::endl;

    }

};


int main() {     CircularQueue
queue;


    queue.enqueue(1);     queue.enqueue(2);
queue.enqueue(3);

    queue.display();

    queue.dequeue();     queue.display();

    queue.enqueue(4);     queue.enqueue(5);

    queue.enqueue(6); // Queue is full at this point
queue.display();

return 0;

}
```

Output:


Activities
Terminal
Nov 6 09:52
student@student-ThinkCentre-neo-50s-Gen-3: ~
student@student-ThinkCentre-neo-50s-Gen-3:~$ g++ queue.cpp
student@student-ThinkCentre-neo-50s-Gen-3:~$ ./a.out
1 2 3
2 3
2 3 4 5 6
student@student-ThinkCentre-neo-50s-Gen-3:~$