ASSIGNMENT 6

Coffee Shop Line (Simple Queue) OR Printer Spooler (Circular Queue)

PROGRAM 1(coffee shop) :-

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

struct Node {
    string name;
    Node* next;
};

class queue {
private:
    Node* front;
    Node* rear;
public:
    queue() {
        front = nullptr;
        rear = nullptr;
    }

    void enqueue(string customerName) {
        Node* temp = new Node();
        temp->name = customerName;
        temp->next = nullptr;
        if (rear == nullptr) {
            front = rear = temp;
        } else {
            rear->next = temp;
            rear = temp;
        }
        cout << customerName << " joined the line.\n\n";
```

```
    }

    void dequeue() {
        if (front == nullptr) {
            cout << "No customers in line.\n";
            return;
        }
        Node* temp = front;
        cout << front->name << "'s order is ready. They leave the line.\n\n";
        front = front->next;

        if (front == nullptr) {
            rear = nullptr;
        }

        delete temp;
    }

    void display() {
        if (front == nullptr) {
            cout << "Line is empty.\n";
            return;
        }
        cout << "Current Line: ";
        Node* temp = front;
        while (temp != nullptr) {
            cout << temp->name;
            if (temp->next != nullptr)
                cout << " -> ";
            temp = temp->next;
        }
        cout << "\n\n";
    }
};
```

```
int main() {
    int choice;
    queue q;
    string name;

    cout << "--- Coffee Shop Queue Menu ---" << endl;
    cout << "1. New Customer Arrival (Enqueue)" << endl;
    cout << "2. Serve Customer (Dequeue)" << endl;
    cout << "3. Show Queue" << endl;
    cout << "4. Exit" << endl;
    do {
        cout << "Enter your choice: ";
        cin >> choice;

        if (choice == 1) {
            cout << "Enter customer name: ";
            cin >> name;
            q.enqueue(name);
        }
        else if (choice == 2) {
            q.dequeue();
        }
        else if (choice == 3) {
            q.display();
        }
        else if (choice == 4) {
                        cout<<"exiting the code";
            return 0;
        }
        else {
            cout << "Invalid choice\n";
        }
    } while (choice != 4);
    return 0;
}
```

OUTPUT :-

```
--- Coffee Shop Queue Menu ---
1. New Customer Arrival (Enqueue)
2. Serve Customer (Dequeue)
3. Show Queue
4. Exit
Enter your choice: 1
Enter customer name: niraj
niraj joined the line.

Enter your choice: 1
Enter customer name: khilesh
khilesh joined the line.

Enter your choice: 1
Enter customer name: atharva
atharva joined the line.

Enter your choice: 2
niraj's order is ready. They leave the line.

Enter your choice: 3
Current Line: khilesh -> atharva

Enter your choice: 4
exiting the code

------------------
(program exited with code: 0)
Press return to continue
```

PROGRAM 2(print spooler) :-

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

class PrinterSpooler {
public:
    int front, rear, size = 10;
    string queue[10];
```

```
PrinterSpooler() {
   front = -1;
   rear = -1;
}



void enqueue() {
   if ((rear + 1) % size == front) {
      cout << "You cannot insert new job as the spooler is full" << endl<<endl;
      return;
   }
   cout << "Enter job name: ";
   string job;
   cin >> job;

   if (front == -1 && rear == -1) {
      front = 0;
      rear = 0;
      queue[rear] = job;
   } else {
      rear = (rear + 1) % size;
      queue[rear] = job;
   }       cout << endl;

}

void dequeue() {
   if (front == -1 && rear == -1) {
      cout << "cannot delete as the Spooler is empty" << endl<<endl;
      return;
   }
   cout << "Processing job: " << queue[front] << endl;
   if (front == rear) {
      front = -1;
```

```
            rear = -1;
        } else {
            front = (front + 1) % size;
        }
                cout << endl;

    }

    void display() {
        if (front == -1 && rear == -1) {
            cout << "Cannot display as spooler is empty" << endl<<endl;
            return;
        }else {
        cout << "Jobs in spooler: ";
        for(int i=front;i<=rear;i++){
                            cout<<queue[i];
            cout << " -> ";
                }
               cout << endl;
      }
    }
};

int main() {
    PrinterSpooler p;
    int choice;

    cout << "--- Spooler Menu ---" << endl;
    cout << "1. Enter new job" << endl;
    cout << "2. Process job" << endl;
    cout << "3. Display spooler" << endl;
    cout << "4. Exit" << endl;

    do {
        cout << "Enter your choice: ";
```

```
        cin >> choice;

        if (choice == 1) {
            p.enqueue();
        } else if (choice == 2) {
            p.dequeue();
        } else if (choice == 3) {
            p.display();
        } else if (choice == 4) {
            cout << "Exiting the code" << endl;
            break;
        } else {
            cout << "Invalid choice" << endl;
        }
    } while (choice != 4);

    return 0;
}
```

OUTPUT :-

```
--- Spooler Menu ---
1. Enter new job
2. Process job
3. Display spooler
4. Exit
Enter your choice: 1
Enter job name: report

Enter your choice: 1
Enter job name: invoice

Enter your choice: 1
Enter job name: speech

Enter your choice: 3
Jobs in spooler: report -> invoice -> speech ->
Enter your choice: 2
Processing job: report

Enter your choice: 3
Jobs in spooler: invoice -> speech ->
Enter your choice: 4
Exiting the code
```