Program 3a

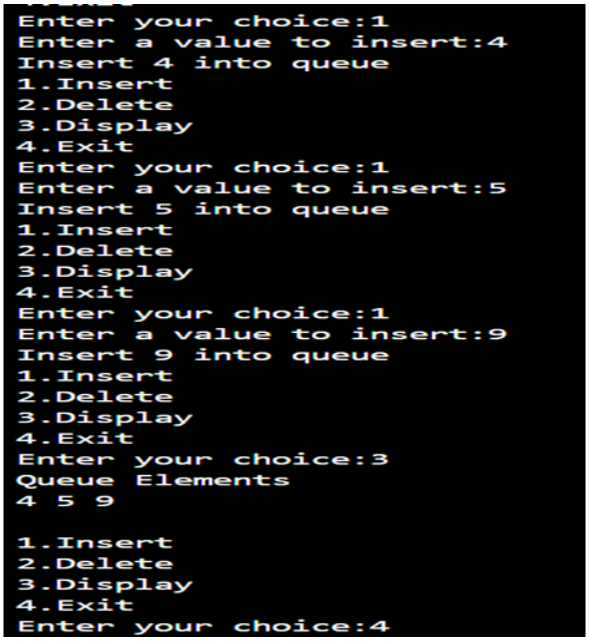
Write A Program to simulate the working of a queue of integers using an array. Provide the following operations: Insert, Delete, Display

The program should print appropriate messages for queue empty and queue overflow conditions

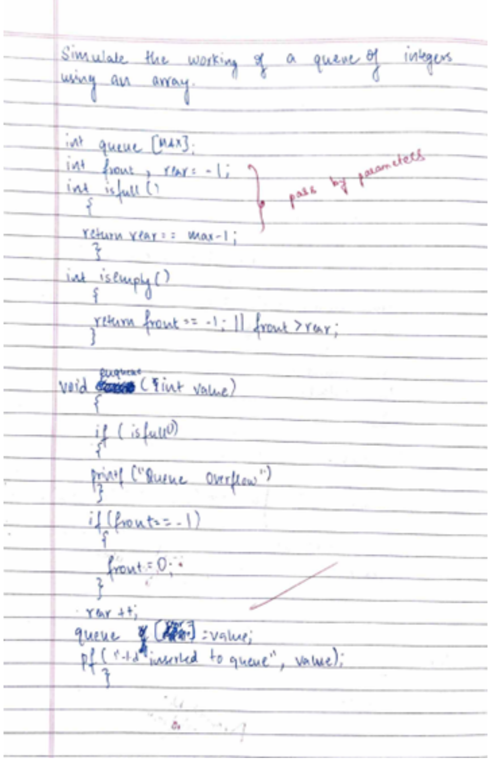
Code:

```
 #include <stdio.h>
#define max_size 4
int queue [max_size];
int front =-1;
int rear=-1;


void insert(int value){
  if (rear==max_size -1){
    printf("Queue overflow! Cannot insert elements");
  }
  else{
    if(front == -1){
      front =0;
    }


    queue[++rear]=value;
    printf("Insert %d into queue",value);
    }
}
 void delete(){
    if(front==-1 || front>rear){
        printf("Queue underflow!Cannot delete ");
    }
    else{
        printf("Deleted %d from the queue",queue[front]);
        front++;
    }
}

void display(){
    if (front==-1 || front>rear){
        printf("Queue is empty");
    }
    else{
        printf("Queue Elements\n");
        for(int i=front;i<=rear;i++){
            printf("%d ",queue[i]);
        }
        printf("\n");
    }
```

```
}
 int main(){
   int choice, value;
   while(1){
       printf("\n1.Insert");
       printf("\n2.Delete");
       printf("\n3.Display");
       printf("\n4.Exit");
       printf("\nEnter your choice:");
       scanf("%d",&choice);
       switch (choice){
          case 1: printf("Enter a value to insert:");
                 scanf("%d",&value);
                 insert(value);
                 break;
          case 2: delete();
          break;
          case 3: display();
          break;
          case 4: return 0;
          default: printf("Invalid choice! Please try again\n");
       }
   }
```



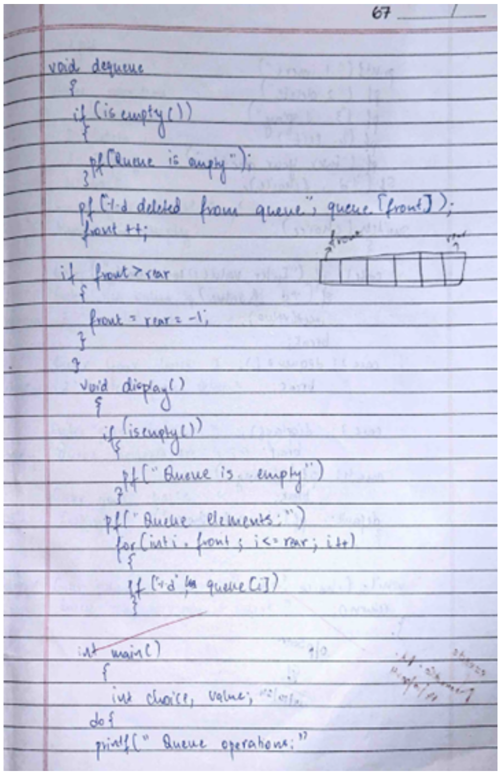
```
Enter your choice:1
Enter a value to insert:4
Insert 4 into queue
1.Insert
2.Delete
3.Display
4.Exit
Enter your choice:1
Enter a value to insert:5
Insert 5 into queue
1.Insert
2.Delete
3.Display
4.Exit
Enter your choice:1
Enter a value to insert:9
Insert 9 into queue
1.Insert
2.Delete
3.Display
4.Exit
Enter your choice:3
Queue Elements
4 5 9

1.Insert
2.Delete
3.Display
4.Exit
Enter your choice:4
```



Simulate the working of a queue of integers using an array.

```
int queue [MAX];
int front , rear = -1;
int isfull ()
  {
   return rear == max-1;
  }
int isempty()
  {
   return front == -1; || front > rear;
  }

void enqueue (int value)
  {
   if ( isfull())
   {
   printf ("Queue Overflow")
   }
   if (front == -1)
   {
     front = 0;
   }
  rear ++;
 queue [rear] =value;
 pf ("%d inserted to queue", value);
  }
```

pass by parameters



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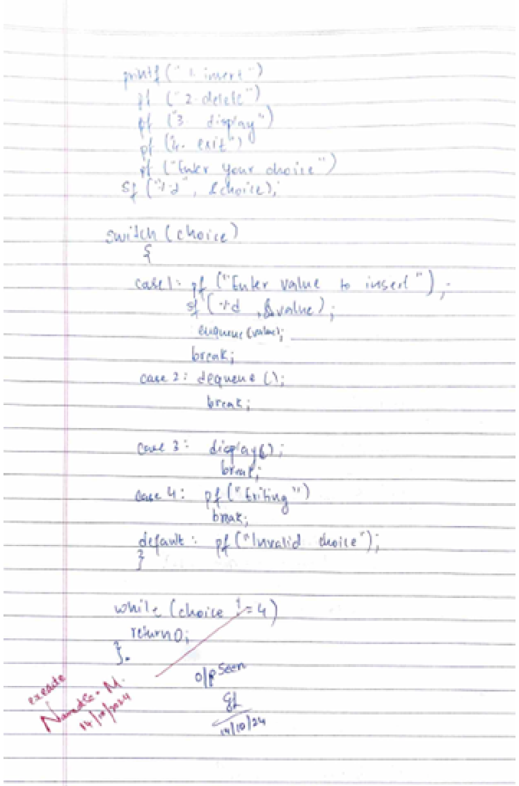
```
void dequeue
  {
   if (is empty())
   {
    pf("Queue is empty");
   }
   pf ("%d deleted from queue", queue [front]);
   front ++;

 if front > rear
   {
    front = rear = -1;
   }
  }
  void display()
    {
     if (isempty())
     {
      pf(" Queue is empty")
     }
     pf(" Queue elements:")
      for(int i = front ; i<= rear; i++)
       {
        pf ("%d", queue [i])
       }

 int main()
    {
     int choice, value;
  do {
   printf(" Queue operations:"
```

front

rear



```
printf(" 1. insert ")
  pf ("2. delete")
  pf ("3. display")
  pf ("4. exit")
  pf ("Enter your choice")
sf ("%d", &choice);

switch (choice)
  {
   case1: pf ("Enter value to insert");
          sf ("%d ,&value);
           enqueue (value);
          break;
   case 2: dequeue ();
            break;

   case 3:  display();
             break;
   case 4:  pf ("Exiting")
             break;
   default : pf ("Invalid choice");
  }

while (choice != 4)
 return 0;
}.
```

o/p seen

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execute

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Output:

```
           Queue operations:
             1. Insert
             2. Delete
             3. Display
             4. Exit
           Enter your choice: 3
display    Queue is empty!

           Enter your choice: 1
           Enter the value to insert: 3
insertion  3 inserted into the queue

           Enter your choice: 2
deletion   3 deleted from queue

           Enter your choice: 3
display    Queue elements are: 4 5 9

           Enter your choice: 4
exit       Exiting...


overflow   Enter value to insert: 9
           Queue overflow! cannot insert 9.
```