Data Structures using C

25th March 2022

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Aim: - Studying and coding on queue.

Objective: - To perform enqueue, dequeue, and display operations on queue in C language

Code: -

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Queue

```
#include <stdio.h>
# define SIZE 100

void enqueue(void);
void dequeue(void);
void show(void);
int int_arr[SIZE];
int Rear = -1;
int Front = -1;

int main(){
    int ch;
    while(1){
        printf("\n1.Enqueue \n2. Dequeue \n3. Display Queue
                \n4. Exit \n Enter your choice (1-4):");
        scanf("%d", &ch);

        switch(ch){
          case 1:
              Equeue();
              break;
          Case 2:
              dequeue();
              break;
          case 3:
              Show();
              break;
          case 4: exit(0);
          default:
              printf("Incorrect choice);
          }
    }
}
```

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Queue

```
void enqueue () {
    int insert_item;
    if (Rear = SIZE -1)
        printf (" Overflow \n");
    else {
        if (front = = -1) {
            front =0;
            printf(" Element ~~to~~ be inserted: ");
            scanf ("%d", &insert_item);
            Rear = Rear +1 ;
            inp_arr [Rear] = insert_item;
            }
        }
}

void dequeue(){
    if(front = = -1 || Front > Rear) {
        printf(" Underflow \n");
        return ;
    }
    else {
        printf (" Element to be deleted %d \n", inp_arr[front]);
        front = front +1;
    }
}

void show () {
    if (front = -1)
        printf(" Empty Queue") ;
    else {
        printf ("Queue \n");
        for (int i = front i<= Rear; i++) {
            printf ("%d", inp_arr[i]); }
}
```

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Screenshot: -

```c
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#include <stdio.h>
#include <stdlib.h>
# define SIZE 100
void enqueue(void);
void dequeue(void);
void show(void);
int inp_arr[SIZE];
int Rear = - 1;
int Front = - 1;
int main(){

    int ch;
    while (1){

        printf("\n1.Enqueue\n2.Dequeue\n3.Display the Queue\n4.Exit\nEnter your choice: ");
        scanf("%d", &ch);

        switch (ch){
            case 1:
                enqueue();
                break;
            case 2:
                dequeue();
                break;
            case 3:
                show();
                break;
            case 4: exit(0);
            default:
            printf("Incorrect choice \n");
        }
    }
}

void enqueue(){

    int insert_item;
```

```c
void enqueue(){
    int insert_item;
    if (Rear == SIZE - 1)
       printf("Overflow \n");
    else{
        if (Front == - 1){
            Front = 0;
            printf("Element to be inserted: ");
            scanf("%d", &insert_item);
            Rear = Rear + 1;
            inp_arr[Rear] = insert_item;
        }
    }
}

void dequeue(){
    if (Front == - 1 || Front > Rear){
        printf("Underflow \n");
        return ;
    }
    else{
        printf("Element to be deleted: %d\n", inp_arr[Front]);
        Front = Front + 1;
    }
}

void show(){
    if (Front == - 1)
        printf("Empty Queue \n");

    else{
        printf("Queue: \n");
        for (int i = Front; i <= Rear; i++){
            printf("%d ", inp_arr[i]);
            printf("\n");
        }
    }
}
```

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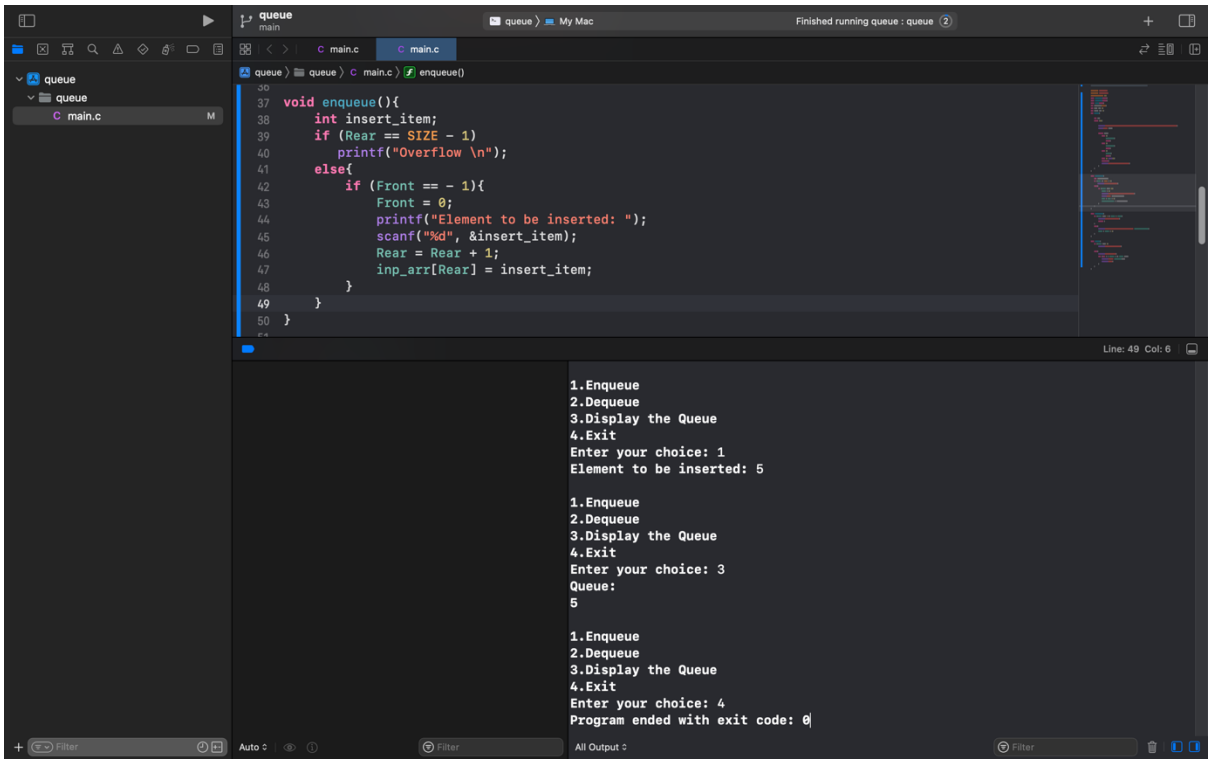

Result: - A queue in C is basically a linear data structure to store and manipulate the data elements. It follows the order of First In First Out (FIFO). In queues, the first element entered into the array is the first element to be removed from the array.