#include <stdio.h>

#include <stdlib.h>

#include <limits.h>

#define CAPACITY 100

int queue[CAPACITY];

unsigned int size = 0;

unsigned int rear = CAPACITY - 1;

unsigned int front = 0;

int enqueue(int data);

int dequeue();

int isFull();

int isEmpty();

int getRear();

int getFront();

int main()

{

int ch, data;

while (1)

{

printf("--------------------------------------\n");

printf(" QUEUE ARRAY IMPLEMENTATION PROGRAM \n");

printf("--------------------------------------\n");

printf("1. Enqueue\n");

printf("2. Dequeue\n");

printf("3. Size\n");

printf("4. Get Rear\n");

printf("5. Get Front\n");

printf("0. Exit\n");

printf("--------------------------------------\n");

printf("Select an option: ");

scanf("%d", &ch);

switch (ch)

{

case 1:

printf("\nEnter data to enqueue: ");

scanf("%d", &data);

if (enqueue(data))

printf("Element added to queue.");

else

printf("Queue is full.");

break;

case 2:

data = dequeue();

if (data == INT\_MIN)

printf("Queue is empty.");

else

printf("Data => %d", data);

break;

case 3:

if (isEmpty())

printf("Queue is empty.");

else

printf("Queue size => %d", size);

break;

case 4:

if (isEmpty())

printf("Queue is empty.");

else

printf("Rear => %d", getRear());

break;

case 5:

if (isEmpty())

printf("Queue is empty.");

else

printf("Front => %d", getFront());

break;

case 0:

printf("Exiting from app.\n");

exit(0);

default:

printf("Invalid choice, please input number between (0-5).");

break;

}

printf("\n\n");

}

}

int enqueue(int data)

{

if (isFull())

{

return 0;

}

rear = (rear + 1) % CAPACITY;

size++;

queue[rear] = data;

return 1;

}

int dequeue()

{

int data = INT\_MIN;

if (isEmpty())

{

return INT\_MIN;

}

data = queue[front];

front = (front + 1) % CAPACITY;

size--;

return data;

}

int isFull()

{

return (size == CAPACITY);

}

int isEmpty()

{

return (size == 0);

}

int getFront()

{

return (isEmpty())

? INT\_MIN

: queue[front];

}

int getRear()

{

return (isEmpty())

? INT\_MIN

: queue[rear];

}

**OUTPUT:**

**--------------------------------------**

**QUEUE ARRAY IMPLEMENTATION PROGRAM**

**--------------------------------------**

**1. Enqueue**

**2. Dequeue**

**3. Size**

**4. Get Rear**

**5. Get Front**

**0. Exit**

**--------------------------------------**

**Select an option: 1**

**Enter data to enqueue: 12**

**Element added to queue.**

**--------------------------------------**

**QUEUE ARRAY IMPLEMENTATION PROGRAM**

**--------------------------------------**

**1. Enqueue**

**2. Dequeue**

**3. Size**

**4. Get Rear**

**5. Get Front**

**0. Exit**

**--------------------------------------**

**Select an option: 1**

**Enter data to enqueue: 23**

**Element added to queue.**

**--------------------------------------**

**QUEUE ARRAY IMPLEMENTATION PROGRAM**

**--------------------------------------**

**1. Enqueue**

**2. Dequeue**

**3. Size**

**4. Get Rear**

**5. Get Front**

**0. Exit**

**--------------------------------------**

**Select an option: 1**

**Enter data to enqueue: 34**

**Element added to queue.**

**--------------------------------------**

**QUEUE ARRAY IMPLEMENTATION PROGRAM**

**--------------------------------------**

**1. Enqueue**

**2. Dequeue**

**3. Size**

**4. Get Rear**

**5. Get Front**

**0. Exit**

**--------------------------------------**

**Select an option: 2**

**Data => 12**

**--------------------------------------**

**QUEUE ARRAY IMPLEMENTATION PROGRAM**

**--------------------------------------**

**1. Enqueue**

**2. Dequeue**

**3. Size**

**4. Get Rear**

**5. Get Front**

**0. Exit**

**--------------------------------------**

**Select an option: 2**

**Data => 23**

**--------------------------------------**

**QUEUE ARRAY IMPLEMENTATION PROGRAM**

**--------------------------------------**

**1. Enqueue**

**2. Dequeue**

**3. Size**

**4. Get Rear**

**5. Get Front**

**0. Exit**

**--------------------------------------**

**Select an option: 3**

**Queue size => 1**

**--------------------------------------**

**QUEUE ARRAY IMPLEMENTATION PROGRAM**

**--------------------------------------**

**1. Enqueue**

**2. Dequeue**

**3. Size**

**4. Get Rear**

**5. Get Front**

**0. Exit**

**--------------------------------------**

**Select an option:**