SWE 2001 DA-1

NAME: PRANAY AGRAWAL
REGISTRATION NO: 22MIS0172

Q1) Given an array A of n integers. You have to make a queue and stack of the given integers. Queue should contain only prime numbers and stack should contain only composite numbers. Display queue and stack contents.

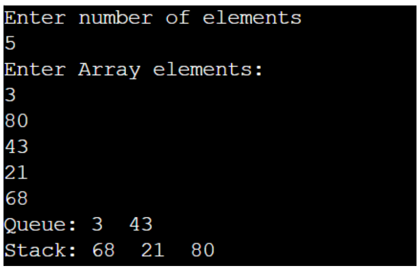
Code:

```
#include <stdio.h>
int top=-1,front=-1,rear=-1,fac=0;
void push(int n,int stk[],int data){
   if(top==(n-1)){
      printf("Stack is Full");
   }
   else{
      top+=1;
      stk[top]=data;
   }
}
void add(int n,int que[],int data){
   if(rear==(n-1)){
      printf("Queue is full");
   }
   else{
      if(rear==-1){
         front=0;
      }
      rear+=1;
      que[rear]=data;
   }
}
void main()
{
```

```
int n,k=0;
printf("Enter number of elements\n");
scanf("%d",&n);
int arr[n];
printf("Enter Array elements:\n");
for(int i=0;i<n;i++){
   scanf("%d",&arr[i]);
}
for(int i=0;i<n;i++){
   if(arr[i]<2){
         k+=1;


      }
   for(int j=2;j<arr[i];j++){
      if(arr[i]%j==0){
         k+=1;
         break;


      }
   }
}
int t=n-k;
int stk[k];
int que[t];
for(int i=0;i<n;i++){
   if(arr[i]<2){
         fac=1;


      }
      else{
   for(int j=2;j<arr[i];j++){
```

```
            if(arr[i]%j==0){
                fac=1;
                break;

            }
        }
            }
            if(fac==1){
                push(k,stk,arr[i]);
            }
            else{
                add(t,que,arr[i]);
            }
            fac=0;
    }
    printf("Queue: ");
    for(int i=0;i<t;i++){
        printf("%d  ",que[i]);
    }
    printf("\nStack: ");
    for(int i=0;i<k;i++){
        printf("%d  ",stk[i]);
    }


}
```

Sample Input/Output:



```
Enter number of elements
5
Enter Array elements:
3
80
43
21
68
Queue: 3  43
Stack: 68  21  80
```

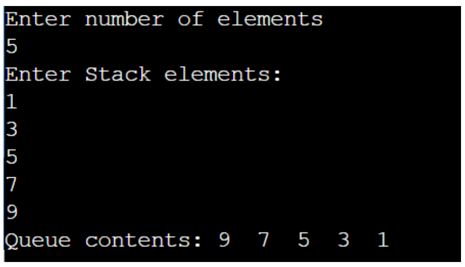
Q2) Using push and pop operations of stack create a queue and display the contents of queue. NOTE: Stack’s property is LIFO and Queue’s property is FIFO.

Code:

```
#include <stdio.h>
int top=-1,front=-1,rear=-1,fac=0;
void push(int n,int stk[],int data){
   if(top==(n-1)){
      printf("Stack is Full");
   }
   else{
      top+=1;
      stk[top]=data;
   }
}
int pop(int stk[]){
   if(top==-1){
      printf("Stack is Empty");
   }
   else{
      return stk[top--];
   }
}
void add(int n,int que[],int data){
   if(rear==(n-1)){
      printf("Queue is full");
   }
   else{
      if(rear==-1){
         front=0;
```

```
        }
        rear+=1;
        que[rear]=data;
    }
}
void main()
{
    int n,t;
    printf("Enter number of elements\n");
    scanf("%d",&n);
    int stk[n];
    int que[n];
    printf("Enter Stack elements:\n");
    for(int i=0;i<n;i++){
        scanf("%d",&t);
        push(n,stk,t);
    }
    for(int i=0;i<n;i++){
        add(n,que,pop(stk));
    }

    printf("Queue contents: ");
    for(int i=0;i<n;i++){
        printf("%d  ",que[i]);
    }



}
```

Sample Input/Output:



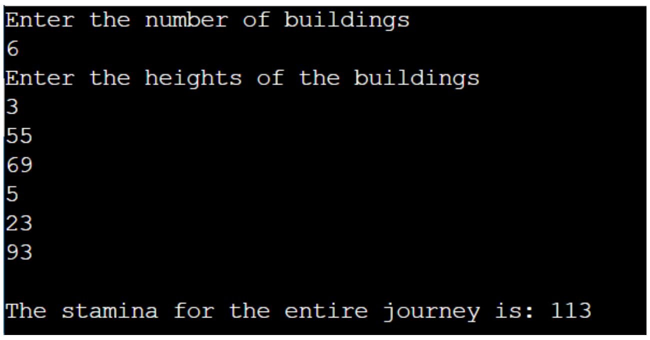
```
Enter number of elements
5
Enter Stack elements:
1
3
5
7
9
Queue contents: 9  7  5  3  1
```

Q3) Humpy likes to jump from one building to another. But he only jumps to next higher building and stops when no higher building is available. Stamina required for a journey is xor of all the heights on which humpy jumps until he stops.

Code:

```
#include <stdio.h>

int main()
{
   int n,st=0;
   printf("Enter the number of buildings\n");
   scanf("%d",&n);
   int arr[n];
   printf("Enter the heights of the buildings\n");
   for(int i=0;i<n;i++){
      scanf("%d",&arr[i]);
   }
   int i=0;
   while(i<n && (i==0||arr[i]>arr[i-1])){
      st^=arr[i];
      i++;
   }
   printf("\nThe stamina for the entire journey is: %d",st);
}
```

Sample Input/Output:



```
Enter the number of buildings
6
Enter the heights of the buildings
3
55
69
5
23
93

The stamina for the entire journey is: 113
```