1. **Write a program to simulate the working of stack using an array with the following : a) Push b) Pop c) Display**

```
#include <stdio.h>
#include <stdlib.h>
int N;
#define N 4
int stack[N];
int top=-1;

void push(){
   if(top>=N-1){
      printf("stack overflow!\n");
   }
   else{
   int ele;
   printf("enter the element to be inserted:\n");
   scanf("%d",&ele);
   top++;
   stack[top]=ele;
   }
}

void pop(){
   if(top<0){
      printf("stack underflow!\n");
   }
   else{
   printf("element popped:%d",stack[top]);
   top--;
   }
}
```

```
void display(){
   int i;
   printf("the stack is:\n");
   for(i=N;i>=0;i--){
      printf("%d\n",stack[i]);
   }
   i=0;
}

void main(){
   int choice;
   printf("Enter 1 to push, 2 for pop, 3 to display stack and 4 to exit\n");
   scanf("%d",&choice);
   while(1){
   switch(choice){
      case 1: push();
            break;
      case 2: pop();
            break;
      case 3: display();
            break;
      case 4: exit(0);
            break;
      default: printf("enter valid input!\n");
   }
   printf("enter your choice:\n");
   scanf("%d",&choice);
   }
}
```

OUTPUT:

```
Enter 1 to push, 2 for pop, 3 to display stack and 4 to exit
1
enter the element to be inserted:
2
enter your choice:
1
enter the element to be inserted:
4
enter your choice:
1
enter the element to be inserted:
5
enter your choice:
3
the stack is:
0
0
5
4
2
enter your choice:
1
enter the element to be inserted:
1
enter your choice:
1
stack overflow!
enter your choice:
3
the stack is:
0
1
5
4
2
enter your choice:
2
element popped:1enter your choice:
2
element popped:5enter your choice:
2
element popped:4enter your choice:
2
element popped:2enter your choice:
2
stack underflow!
```