## Aim:

Write a program to implement stack using arrays.

representation

```
Sample Input and Output:
    1.Push 2.Pop 3.Display 4.Is Empty 5.Peek 6.Exit
    Enter your option : 4
    Stack is empty.
    1.Push 2.Pop 3.Display 4.Is Empty 5.Peek 6.Exit
    Enter your option : 2
    Stack is underflow.
    1. Push 2. Pop 3. Display 4. Is Empty 5. Peek 6. Exit
    Enter your option : 3
    Stack is empty.
    1.Push 2.Pop 3.Display 4.Is Empty 5.Peek 6.Exit
    Enter your option : 5
    Stack is underflow.
    1.Push 2.Pop 3.Display 4.Is Empty 5.Peek 6.Exit
    Enter your option: 1
    Enter element : 25
    Successfully pushed.
    1. Push 2. Pop 3. Display 4. Is Empty 5. Peek 6. Exit
    Enter your option: 1
    Enter element : 26
    Successfully pushed.
    1. Push 2. Pop 3. Display 4. Is Empty 5. Peek 6. Exit
    Enter your option : 3
    Elements of the stack are : 26 25
    1.Push 2.Pop 3.Display 4.Is Empty 5.Peek 6.Exit
    Enter your option : 2
    Popped value = 26
    1.Push 2.Pop 3.Display 4.Is Empty 5.Peek 6.Exit
    Enter your option : 4
    Stack is not empty.
    1.Push 2.Pop 3.Display 4.Is Empty 5.Peek 6.Exit
    Enter your option : 5
    Peek value = 25
    1.Push 2.Pop 3.Display 4.Is Empty 5.Peek 6.Exit
    Enter your option : 6
```

## **Source Code:**

## StackUsingArray.c

```
#include <stdio.h>
#include <stdlib.h>
#define STACK_MAX_SIZE 10
int arr[STACK_MAX_SIZE];
int top = -1;
void push(int element)
{
```

```
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```

```
if(top == STACK_MAX_SIZE - 1)
      printf("Stack is overflow.\n");
   }
   else
   {
      top = top + 1;
      arr[top] = element;
      printf("Successfully pushed.\n");
   }
}
void display()
   if (top < 0)
      printf("Stack is empty.\n");
   }
   else
      printf("Elements of the stack are : " );
      for(int i = top; i >= 0; i--)
         printf("%d ", arr[i]);
      printf("\n");
   }
}
void pop()
{
   int x;
   if(top < 0)
      printf("Stack is underflow.\n");
   }
   else
      x = arr[top];
      top = top - 1;
      printf("Popped value = %d\n",x);
   }
void peek()
   int x;
   if(top < 0)
      printf("Stack is underflow.\n");
   }
   else
      x = arr[top];
      printf("Peek value = %d\n",x);
   }
}
void isEmpty()
```

```
if (top < 0)
   {
      printf("Stack is empty.\n");
   }
   else
      printf("Stack is not empty.\n");
   }
}
int main()
   int op, x;
   while(1)
      printf("1.Push 2.Pop 3.Display 4.Is Empty 5.Peek 6.Exit\n");
      printf("Enter your option : ");
      scanf("%d", &op);
      switch(op)
         case 1:
         printf("Enter element : ");
         scanf("%d", &x);
         push(x);
         break;
         case 2:
         pop();
         break;
         case 3:
         display();
         break;
         case 4:
         isEmpty();
         break;
         case 5:
         peek();
         break;
         case 6:
         exit(0);
      }
   }
}
```

## Execution Results - All test cases have succeeded!

```
Test Case - 1
User Output
1.Push 2.Pop 3.Display 4.Is Empty 5.Peek 6.Exit 1
Enter your option : 1
Enter element : 10
Successfully pushed. 1
1.Push 2.Pop 3.Display 4.Is Empty 5.Peek 6.Exit 1
Enter your option : 1
Enter element : 20
Successfully pushed. 1
```

Enter your option: 1 Enter element: 30 Successfully pushed. 3 1.Push 2.Pop 3.Display 4.Is Empty 5.Peek 6.Exit 3 Enter your option: 3 Elements of the stack are: 30 20 10 5 1.Push 2.Pop 3.Display 4.Is Empty 5.Peek 6.Exit 5 Enter your option: 5 Peek value = 30 2 1.Push 2.Pop 3.Display 4.Is Empty 5.Peek 6.Exit 2 Enter your option: 2 Popped value = 30 2 1.Push 2.Pop 3.Display 4.Is Empty 5.Peek 6.Exit 2 Enter your option: 2 Popped value = 20 3 1.Push 2.Pop 3.Display 4.Is Empty 5.Peek 6.Exit 3 Enter your option: 3 Elements of the stack are: 10 5 1.Push 2.Pop 3.Display 4.Is Empty 5.Peek 6.Exit 5 Enter your option: 5 Peek value = 10 4 1.Push 2.Pop 3.Display 4.Is Empty 5.Peek 6.Exit 4 Enter your option: 4 Stack is not empty. 2 1.Push 2.Pop 3.Display 4.Is Empty 5.Peek 6.Exit 4 Enter your option: 2 Popped value = 10 3 1.Push 2.Pop 3.Display 4.Is Empty 5.Peek 6.Exit 2 Enter your option: 2 Fopped value = 10 3 1.Push 2.Pop 3.Display 4.Is Empty 5.Peek 6.Exit 3 Enter your option: 3 Stack is empty. 4 1.Push 2.Pop 3.Display 4.Is Empty 5.Peek 6.Exit 4 Enter your option: 3 Stack is empty. 4 1.Push 2.Pop 3.Display 4.Is Empty 5.Peek 6.Exit 4 Enter your option: 4 Stack is empty. 4 1.Push 2.Pop 3.Display 4.Is Empty 5.Peek 6.Exit 4 Enter your option: 4 Stack is empty. 6 1.Push 2.Pop 3.Display 4.Is Empty 5.Peek 6.Exit 6 Enter your option: 6	1.Push 2.Pop 3.Display 4.Is Empty 5.Peek 6.Exit1
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