PRACTICAL NO :05

Aim : Implement a Stack and perform the stack operations: Push, Pop and Print using Menu Driver Program such as 1.Push, 2.Pop and 3. Print and 4. Exit.

Program:

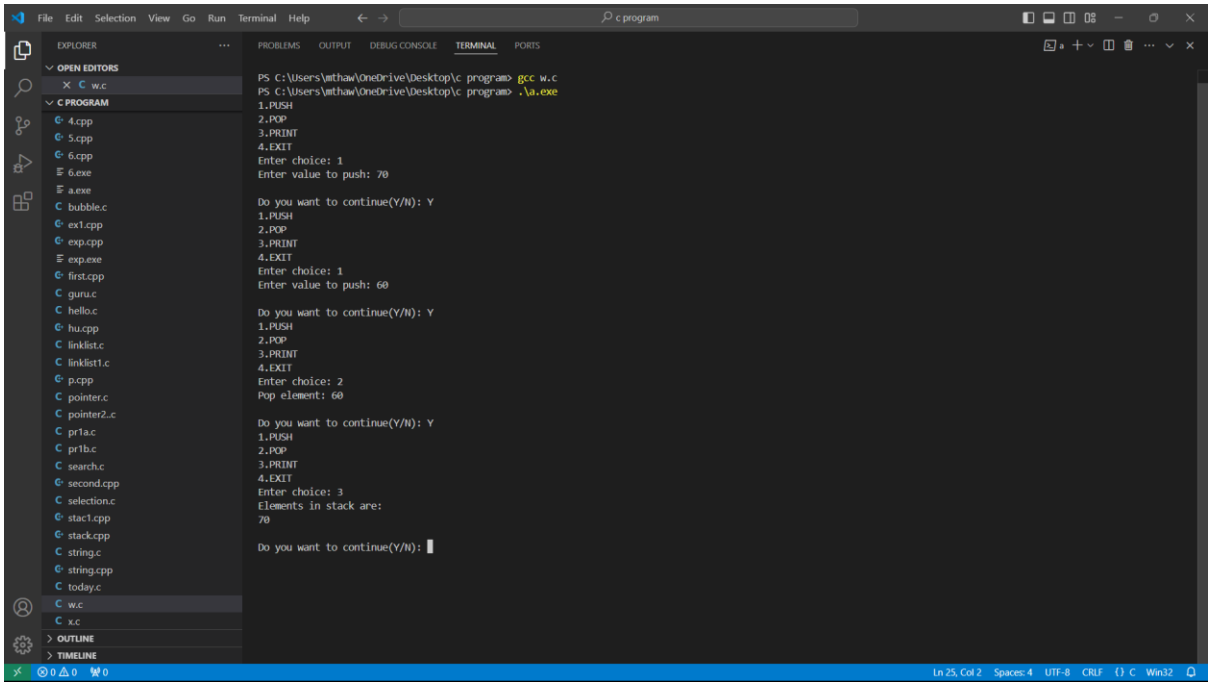
A] Using array :-

```
#include <stdio.h>


#define MAX 100
int stack[MAX];
int top = -1;


void menu()
{
   printf("1.PUSH\n2.POP\n3.PRINT\n4.EXIT\n");
}


void PUSH()
{
   if(top > MAX)
   {
      printf("Stack Overflow\n");
      return;
   }
   top += 1;
   printf("Enter value to push: ");
   int a;
   scanf("%d", &a);
   stack[top] = a;


}
```

```
void POP()
{
   if(top < 0)
   {
      printf("Stack Underflow\n");
      return;
   }
   printf("Pop element: %d\n", stack[top]);
   top -= 1;

}

void PRINT()
{
   if(top == -1)
   {
      printf("No Element in Stack\n");
      return;
   }
   printf("Elements in stack are:\n");
   for(int i = top;i >= 0; i--){
      printf("%d \n", stack[i]);
   }
}

int main()
{
   char ch;
   do
   {

   menu();
   int choice;
```

```
    printf("Enter choice: ");
    scanf("%d", &choice);

    switch (choice)
    {
    case 1:
        PUSH();
        break;
    case 2:
        POP();
        break;
    case 3:
        PRINT();
        break;
    case 4:
        return 0;
    default:
        printf("Invalid Choice\n");
        break;
    }

    printf("\nDo you want to continue(Y/N): ");
    scanf(" %c", &ch);

    } while (ch == 'y' || ch == 'Y');
    return 0;
}
```

Output:



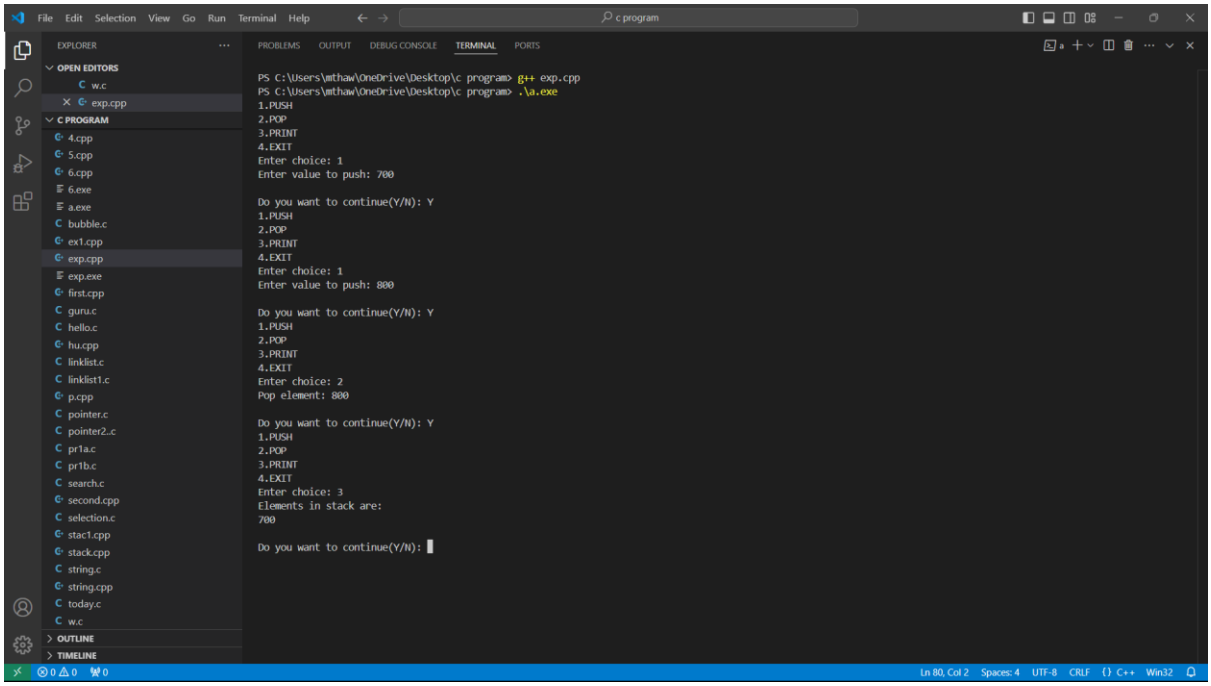
B] Using Linklist :-

```
#include <stdio.h>

#include <stdlib.h>


struct Node {

   int data;

   struct Node* next;

};


struct Node* top = NULL;


void menu() {

   printf("1.PUSH\n2.POP\n3.PRINT\n4.EXIT\n");

}


void PUSH() {

   struct Node* newNode = (struct Node*)malloc(sizeof(struct Node));

   if (!newNode) {

      printf("Stack Overflow\n");
```

```
        return;
    }
    printf("Enter value to push: ");
    scanf("%d", &newNode->data);
    newNode->next = top;
    top = newNode;
}

void POP() {
    if (top == NULL) {
        printf("Stack Underflow\n");
        return;
    }
    struct Node* temp = top;
    printf("Pop element: %d\n", top->data);
    top = top->next;
    free(temp);
}

void PRINT() {
    if (top == NULL) {
        printf("No Element in Stack\n");
        return;
    }
    struct Node* temp = top;
    printf("Elements in stack are:\n");
    while (temp != NULL) {
        printf("%d \n", temp->data);
        temp = temp->next;
    }
}

int main() {
    char ch;
```

```
  do {
    menu();
    int choice;
    printf("Enter choice: ");
    scanf("%d", &choice);

    switch (choice) {
      case 1:
        PUSH();
        break;
      case 2:
        POP();
        break;
      case 3:
        PRINT();
        break;
      case 4:
        return 0;
      default:
        printf("Invalid Choice\n");
        break;
    }

    printf("\nDo you want to continue(Y/N): ");
    scanf(" %c", &ch);
  } while (ch == 'y' || ch == 'Y');
  return 0;
}
```

Output:-



Github link :- https://github.com/MayurThaware122/DSA