Job No: 01

Job Name: Linear array data insert and deletion program.

Data insert program:

Code:

```
#include <stdio.h>
#include <conio.h>

void main() {
	int a[8] = { 4, 6, 7, 9, 8, 2 };
	int item = 3, k = 2, n = 6 - 1;
	int i = 0, j = n;

	printf("Original array Contains......\n");

	for (i = 0; i<n; i++) {
		printf("Array[%d] = %d \n", i, a[i]);
	}

	n = n + 1;

	while (j >= k) {
		a[j + 1] = a[j];
		j = j - 1;
	}

	a[k] = item;

	printf("After insert a new element the array contains.....\n");

	for (i = 0; i<n; i++) {
		printf("Array [%d] = %d \n", i, a[i]);
	}

	getch();
	return 0
}
```

Output:

```
Original array Contains......
Array[0] = 4
Array[1] = 6
Array[2] = 7
Array[3] = 9
Array[4] = 8
After insert a new element the array contains.....
Array [0] = 4
Array [1] = 6
Array [2] = 3
Array [3] = 7
Array [4] = 9
Array [5] = 8
```

Data delete program:

code:

```
#include <stdio.h>

#include <conio.h>

void main() {
	int a[] = { 1, 3, 5, 7, 8 };
	int k = 3, n = 5;
	int i, j;

	printf("The original array elements are :\n");

	for (i = 0; i<n; i++) {
		printf("Array[%d] = %d \n", i, a[i]);
	}

	j = k;

	while (j < n) {
		a[j - 1] = a[j];
		j = j + 1;
	}

	n = n - 1;

	printf("The array elements after deletion :\n");

	for (i = 0; i<n; i++) {
		printf("Array[%d] = %d \n", i, a[i]);
	}
	getch();
	return 0;
}
```

Output:

```
The original array elements are :
Array[0] = 1
Array[1] = 3
Array[2] = 5
Array[3] = 7
Array[4] = 8
The array elements after deletion :
Array[0] = 1
Array[1] = 3
Array[2] = 7
Array[3] = 8
```

Job No: 02

Job Name: Two Matrix multiplication program & test.

Code:

```
#include <stdio.h>

#define SIZE 3
int main()
{
	int A[SIZE][SIZE];
	int B[SIZE][SIZE];
	int C[SIZE][SIZE];
	int row, col, i, sum;
	printf("Enter elements in matrix A of size %dx%d: \n", SIZE, SIZE);
	for (row = 0; row<SIZE; row++)
	{
		for (col = 0; col<SIZE; col++)
		{
			scanf("%d", &A[row][col]);
		}
	}
	printf("\nEnter elements in matrix B of size %dx%d: \n", SIZE, SIZE);
	for (row = 0; row<SIZE; row++)
	{
		for (col = 0; col<SIZE; col++)
		{
			scanf("%d", &B[row][col]);
		}
	}
	for (row = 0; row<SIZE; row++)
	{
		for (col = 0; col<SIZE; col++)
		{
			sum = 0;

			for (i = 0; i<SIZE; i++)
			{
				sum += A[row][i] * B[i][col];
			}

			C[row][col] = sum;   }      }
	printf("\nProduct of matrix A * B = \n");
	for (row = 0; row<SIZE; row++)
	{
		for (col = 0; col<SIZE; col++)
		{
			printf("%d ", C[row][col]);
		}
		printf("\n");
	}
	getch();
	return 0;
}
```

Output:

```
Enter elements in matrix A of size 3x3:
2 3 3
6 2 1
9 6 2

Enter elements in matrix B of size 3x3:
5 3 2
6 5 4
9 5 1

Product of matrix A * B =
55 36 19
51 33 21
99 67 44
```

Job No: 03

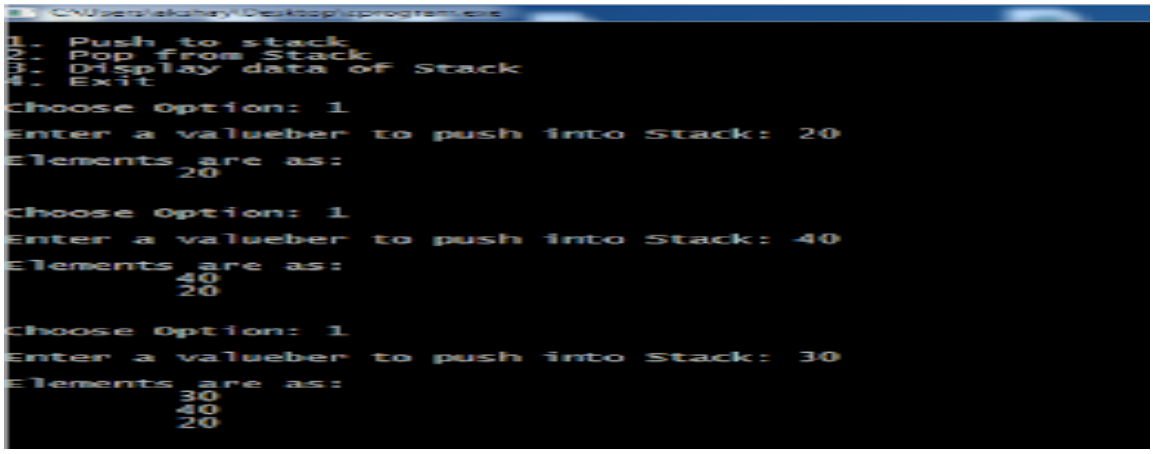
Job Name: Linked list data PUSH and POP program.

Code:

```
#include <stdio.h>
#include <stdlib.h>

struct Node
{
    int Data;
    struct Node *next;
}*top;
void popStack()
{
    struct Node *temp, *var=top;
    if(var==top)
    {
        top = top->next;
        free(var);
    }
    else
    printf("\nStack Empty");
}
void push(int value)
{
 struct Node *temp;
    temp=(struct Node *)malloc(sizeof(struct Node));
    temp->Data=value;
    if (top == NULL)
    {
         top=temp;
         top->next=NULL;
}
    else
    {
        temp->next=top;
        top=temp;
    }
}

void display()
{
     struct Node *var=top;
     if(var!=NULL)
     {
          printf("\nElements are as:\n");
          while(var!=NULL)
          {
               printf("\t%d\n",var->Data);
               var=var->next;
          }
     printf("\n");
     }
     else
     printf("\nStack is Empty");
}

int main(int argc, char *argv[])
{
  int i=0;
     top=NULL;
     printf(" \n1. Push to stack");
     printf(" \n2. Pop from Stack");
     printf(" \n3. Display data of Stack");
```

```
    printf(" \n4. Exit\n");
    while(1)
    {
         printf(" \nChoose Option: ");
         scanf("%d",&i);
         switch(i)
         {
              case 1:
              {
              int value;
              printf("\nEnter a valueber to push into Stack: ");
              scanf("%d",&value);
              push(value);
              display();
              break;
              }
              case 2:
              {
              popStack();
              display();
              break;
              }
              case 3:
              {
              display();
              break;
              }
              case 4:
              {
              struct Node *temp;
              while(top!=NULL)
              {
                   temp = top->next;
                   free(top);
                   top=temp;
              }
              exit(0);
              }
              default:
              {
              printf("\nwrong choice for operation");
              }
         }
    }
```

Output:



Job No: 4

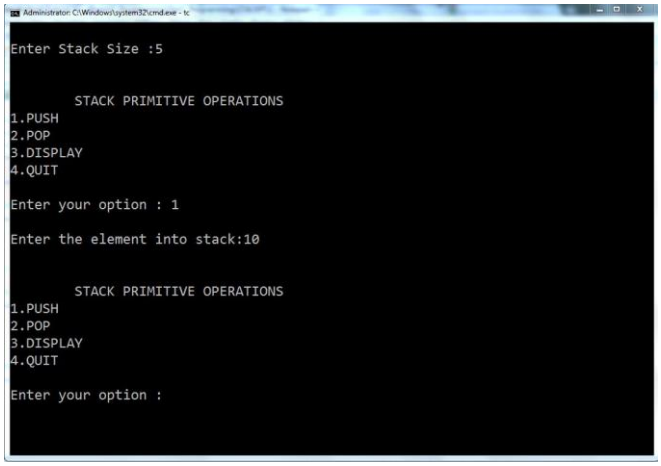
Job Name: Stack PUSH & POP operation program.

Code:

```
 #include <stdio.h>
#include <conio.h>
#define MAX 5
int stack[MAX];
int top = 0;
void push (int value)
{
        if (top == MAX)
        {
                printf("!!! Overflow !!!");
                getch();
        }
        else
        {
                stack[top] = value;
                top++;
        }
}
int pop(void)
{
        top--;
        return stack[top];
}
void show(void)
{
        int i;
        if (top == 0) printf("Stack is empty");
        else
        {
                printf("****Stack****\n);
                for (i = 0; i < top; i++)
                        printf("%d ", stack[i]);
}}
void main()
{
        int option;
        int x;
        clrscr();
        do
        {
                clrscr();
                gotoxy(10, 5); printf("###### MAIN MENU ######");
                gotoxy(10, 6); printf("====================)
                gotoxy(10, 7); printf("1.Push");
                gotoxy(10, 8); printf("2.Pop");
```

```
                gotoxy(10, 9); printf(3.Show”);
                gotoxy(10, 10); printf(4.Exit”);
                gotoxy((10, 12); printf(“Enter your selection[1..4]:”);
                scanf(“%d”, &option);
                clrscr();
                switch(option)
                {               case 1:
                                print(“Enter your value to push: “);
                                scanf(“%d”, &x);
                                push(x);
                                break;
                        case 2:
                                if (top != 0)
                                        printf(“The poped value is %d”, pop());
                                else
                                        printf(“!!! underflow !!!”);
                                getch();
                                break;
                        case 3:
                                show();
                                getch();
        }
}
while(option != 4);
        gotoxy(10, 22); printf(“Press any key to continue …”);
        getch();
}
```

Output:



Job No: 05

Job Name: Write a program for calculating factorial N number and fibonacci number using Recursion.

Factorial of a Number Using Recursion:

Code:

```
#include <stdio.h>
long int multiplyNumbers(int n);
int main()
{
    int n;
    printf("Enter a positive integer: ");
    scanf("%d", &n);
    printf("Factorial of %d = %ld", n, multiplyNumbers(n));
    return 0;
}
long int multiplyNumbers(int n)
{
    if (n >= 1)
        return n*multiplyNumbers(n-1);
    else
        return 1;
}
```

Output:

```
Enter a positive integer: 6
Factorial of 6 = 720
```

Fibonaci of a Number Using Recursion:

Code:

```
#include <stdio.h>
int fibo(int);
   int main()
   {
       int num;
       int result;
          printf("Enter the nth number in fibonacci series: ");
       scanf("%d", &num);
       if (num < 0)
       {
           printf("Fibonacci of negative number is not possible.\n");
       }
       else
       {
           result = fibo(num);
           printf("The %d number in fibonacci series is %d\n", num, result);
       }
       return 0;
   }
   int fibo(int num)
   {
       if (num == 0)
       {
           return 0;
       }
       else if (num == 1)
       {
           return 1;
       }
       else
       {
           return(fibo(num - 1) + fibo(num - 2));
       }
   }
```

Output:

```
Enter the nth number in fibonacci series: 8
The 8 number in fibonacci series is 21
Enter the nth number in fibonacci series: 12
The 12 number in fibonacci series is 144
```

Job No: 06

Job Name: Infix to Postfix program operation Convert in C.

Code:

```
#include<stdio.h>
char stack[20];
int top = -1;
void push(char x)
{
    stack[++top] = x;
}
char pop()
{
    if(top == -1)
        return -1;
    else
        return stack[top--];
}
int priority(char x)
{
    if(x == '(')
        return 0;
    if(x == '+' || x == '-')
        return 1;
    if(x == '*' || x == '/')
        return 2;
}
main()
{
    char exp[20];
    char *e, x;
    printf("Enter the expression :: ");
    scanf("%s",exp);
    e = exp;
    while(*e != '\0')
    {
        if(isalnum(*e))
            printf("%c",*e);
        else if(*e == '(')
            push(*e);
        else if(*e == ')')
        {
            while((x = pop()) != '(')
                printf("%c", x);
        }
        else
        {
            while(priority(stack[top]) >= priority(*e))
                printf("%c",pop());
            push(*e);
        }
        e++;
    }
    while(top != -1)
    {
        printf("%c",pop());
    }
}
```

OUTPUT:

```
Enter the expression :: a+b*c
abc*+

Enter the expression :: (a+b)*c+(d-a)
ab+c*da-+
```

Job No: 07
Job Name: Writing programs to insert and delete data from Queue operations.

Code:

```
#include<stdio.h>
#include<conio.h>

int i,queue[30],front=1,rear,max;

void insert()
{
clrscr();
        if(rear==max)
        {
                print("\nOverflow"):
                getch();
        }

        else
        {
                rear++;
                printf("Item:");scanf("%d",&queue[rear]);
        }
      }

      void delete()
      {
        clrscr();
                if(rear==1)
                {
                        printf("\nUnderflow");
                        getch();
                }

                else {
                        printf("Item:%d\n",queue[front]);
                        front++;
                        // rear--;
                }

                getch();
     }

     void show()
     {

     clrscr();
```

```
    printf("\nitem:\n(\n");
        for(i=front; i<=rear; i++) {
            printf(" %d\n",queue[i]);
        }
    printf("  )");
    getch();
    }

    void main() {
        char ch;
        clrscr();
        printf("How many sell on Queue..(0..30)");scanf("%d",&max);
        clrscr();
        do{
            clrscr();
            printf("1.Insert\n2.Delete\n3.Show\n4.Enter for Exit");
            ch=getch();
            switch(ch){
            case'1':insert();break;
            case'2':delet();break;
            case'3':show();break;
        }
    }while(ch!='\r');
    }
```

Output:

```
         Menu
----------------------------
 1. Insert element in queue
 2. Delete element from queue
 3. Exit
----------------------------
Choose operation : 1

Enter Number : 5
5 is inserted in queue.

Choose operation : 1

Enter Number : 9
9 is inserted in queue.

Choose operation : 1

Enter Number : 88
88 is inserted in queue.

Choose operation : 2

Deleted number is : 5

Choose operation : 2

Deleted number is : 9

Choose operation : 3
```

Job No: 08

Job Name: write a program to search an item from an array using linear search algorithm.

Code:

```
#include <stdio.h>
#include <conio.h>

int main(){
    int inputArray[100], elementCount, counter, num;

    printf("Enter Number of Elements in Array\n");
    scanf("%d", &elementCount);
    printf("Enter %d numbers \n", elementCount);

    /* Read array elements */
    for(counter = 0; counter < elementCount; counter++){
        scanf("%d", &inputArray[counter]);
    }

    printf("Enter a number to serach in Array\n");
    scanf("%d", &num);

    /* search num in inputArray from index 0 to elementCount-1 */
    for(counter = 0; counter < elementCount; counter++){
        if(inputArray[counter] == num){
            printf("Number %d found at index %d\n", num, counter);
            break;
        }
    }

    if(counter == elementCount){
     printf("Number %d Not Present in Input Array\n", num);
    }

    getch();
    return 0;
}
```

Output

```
Enter Number of Elements in Array
6
Enter 6 numbers
7 2 9 4 1 6
Enter a number to serach in Array
4
Number 4 found at index 3
```

Job No: 09

Job Name: write a program to sort n data in ascending order using bubble sort algorithm.

Code:

```
#include <stdio.h>
  #define MAXSIZE 10

  void main()
  {
    int array[MAXSIZE];
    int i, j, num, temp;

      printf("Enter the value of num \n");
      scanf("%d", &num);
      printf("Enter the elements one by one \n");
     for (i = 0; i < num; i++)
      {
          scanf("%d", &array[i]);
      }
      printf("Input array is \n");
      for (i = 0; i < num; i++)
     {
          printf("%d\n", array[i]);
      }
      /*   Bubble sorting begins */
      for (i = 0; i < num; i++)
      {
          for (j = 0; j < (num - i - 1); j++)
          {
              if (array[j] > array[j + 1])
              {
                  temp = array[j];
                 array[j] = array[j + 1];
                  array[j + 1] = temp;
              }
          }
      }
      printf("Sorted array is...\n");
      for (i = 0; i < num; i++)
      {
          printf("%d\n", array[i]);
      }
 }
```

Output:

```
Enter the elements one by one
23
45
67
89
12
34
Input array is
23
45
67
89
12
34
Sorted array is...
12
23
34
45
67
89
```

Job No: 10

Job Name: Write a program to arrange Data Ascending and descending using Quick sort Algorithm.

Code

```
#include <stdio.h>
#include <conio.h>
int main()
{
        int a[10] = { 3,4,7,6,5,1,2,8,10,9 };
        int n = 10
 size
        printf("\n\nArray Data : ");
        for (int i = 0; i < n; i++)
 of array
        {
                printf(" %d ", a[i]);
        }
        for (int i = 0; i < n; i++)
        {
                for (int j = 0; j < n; j++)
values
                {
                        if (a[j] > a[i])
                        {
                                int tmp = a[i];
storing last value
                                a[i] = a[j];
                                a[j] = tmp;
                        }
                }
        }
        printf("\n\nAscending : ");
        for (int i = 0; i < n; i++)
after sorting
        {
                printf(" %d ", a[i]);
        }
        for (int i = 0; i < n; i++)
        {
                for (int j = 0; j < n; j++)
values
                {
                        if (a[j] < a[i])
                        {
                                int tmp = a[i];
storing last value
                                a[i] = a[j];
                                a[j] = tmp;                                    }
                }
        }
        printf("\n\nDescending : ");
        for (int i = 0; i < n; i++)
 after sorting
        {
                printf(" %d ", a[i]);
        }
        _getch();
 user to enter any key
        return 0;
}
```

Output:

```
Array Data :  3  4  7  6  5  1  2  8  10  9

Ascending :  1  2  3  4  5  6  7  8  9  10

Descending :  10  9  8  7  6  5  4  3  2  1
```