SANGOLA COLLEGE, SANGOLA
Class-B.Sc(ECS)-II, SEM-III 2024-25
Practical Assignments
Sub- Data Structure using C++

Assignment No- 1

1) Write a program to implement array data structure with its operations.

```
#include<iostream.h>
#include<conio.h>
#define n 10

int item[n], c = 0;
void insert(int);
void display();
void reverse();
int remove(int);

void main()
{
	int x, ch = 0, pos;
	clrscr();
	while(ch != 5)
	{
		cout<<"\n1. Insert element.\n2. Display element.\n3. 
Reverse element.\n4. Remove element.\n5. Exit\nEnter your choice : ";
		cin>>ch;
		switch(ch)
		{
			case 1:
				cout<<"\nEnter any element : ";
				cin>>x;
				insert(x);
				break;
```

```
                case 2:
                        display();
                        break;

                case 3:
                        reverse();
                        break;

                case 4:
                        cout<<"\nEnter position of element : ";
                        cin>>pos;
                        x = remove(pos);
                        cout<<"Removed element : "<<x<<"\n";
                        break;

                case 5:
                        cout<<"\nProgram stoped...";
                        break;

                default:
                        cout<<"Wrong choice...";
                        break;
            }
        }
getch();
}

void insert(int x)
{
        static int i = 0;
        item[i] = x;
        i++;
        c++;
}

void display()
{
        int i;
        for(i=0; i<=c-1; i++)
```

```
	{
		cout<<item[i]<<"\t";
	}
	cout<<"\n";
}

void reverse()
{
	int i;
	for(i=c-1; i>=0; i--)
	{
		cout<<item[i]<<"\t";
	}
	cout<<"\n";
}

int remove(int pos)
{
	int i, z;
	if(pos<0 || pos>c-1)
	{
		cout<<"\nDelete operation not performed.\n";
		return 0;
	}
	else
	{
		z=item[pos];
		for(i=pos; i<=c; i++)
		{
			item[i] = item[i+1];
		}
		c--;
		return(z);
	}
}
```

2) Write a program that print only even numbers in an array.

```
#include<iostream.h>
#include<conio.h>
#define n 10

int item[n], c = 0;
void insert(int);
void display();

void main()
{
	int x, ch = 0, pos;
	clrscr();
	while(ch != 3)
	{
		cout<<"\n1. Insert element.\n2. Display even element.\n3.
Exit\nEnter your choice : ";
		cin>>ch;
		switch(ch)
		{
			case 1:
				cout<<"\nEnter any element : ";
				cin>>x;
				insert(x);
				break;

			case 2:
				cout<<"\nEven element : ";
				display();
				break;

			case 3:
				cout<<"\nProgram stoped...";
				break;
		}
	}
getch();
}
```

```
void insert(int x)
{
	static int i = 0;
	item[i] = x;
	i++;
	c++;
}

void display()
{
	int i;
	for(i=0; i<=c-1; i++)
	{
		if(item[i] % 2 == 0)
		{
			cout<<item[i]<<"\t";
		}
	}
	cout<<"\n";
}
```

3) Write a program that print only odd numbers in an array.

```
#include<iostream.h>
#include<conio.h>
#define n 10

int item[n], c = 0;
void insert(int);
void display();

void main()
{
	int x, ch = 0, pos;
	clrscr();
	while(ch != 3)
```

```
	{
		cout<<"\n1. Insert element.\n2. Display odd element.\n3. Exit\nEnter your choice : ";
		cin>>ch;
		switch(ch)
		{
			case 1:
				cout<<"\nEnter any element : ";
				cin>>x;
				insert(x);
				break;

			case 2:
				cout<<"\nOdd elements : ";
				display();
				break;

			case 3:
				cout<<"\nProgram stoped...";
				break;
		}
	}
getch();
}

void insert(int x)
{
	static int i = 0;
	item[i] = x;
	i++;
	c++;
}

void display()
{
	int i;
	for(i=0; i<=c-1; i++)
	{
		if(item[i] % 2 != 0)
```

```
            {
                cout<<item[i]<<"\t";
            }
        }
        cout<<"\n";
}
```

4) Write a program that print maximum & minimum number in an array.

```
#include<iostream.h>
#include<conio.h>
#define n 10

int item[n], c = 0;
void insert(int);
void display();

void main()
{
        int x, ch = 0, pos;
        clrscr();
        while(ch != 3)
        {
            cout<<"\n1. Insert element.\n2. Display max & min
element.\n3. Exit\nEnter your choice : ";
            cin>>ch;
            switch(ch)
            {
                case 1:
                    cout<<"\nEnter any element : ";
                    cin>>x;
                    insert(x);
                    break;

                case 2:
                    display();
```

```
                        break;

                case 3:
                        cout<<"\nProgram stoped...";
                        break;
                }
        }
getch();
}
void insert(int x)
{
        static int i = 0;
        item[i] = x;
        i++;
        c++;
}
void display()
{
        int i, max = 0;
        for(i=0; i<=c-1; i++)
        {
                if(max < item[i])
                {
                        max = item[i];
                }
        }
        cout<<"\nMaximum element in an array : "<<max;

        for(i=0; i<=c-1; i++)
        {
                if(max > item[i])
                {
                        max = item[i];
                }
        }
        cout<<"\nMinimum element in an array : "<<max;

        cout<<"\n";
}
```

5) Write a program to find addition of two matrices.

```
#include<iostream.h>
#include<conio.h>
#define m 2
#define n 2

int a[m][n], b[m][n], c = 0;
void insert(int, int);
void display();

void main()
{
	int x, y, ch = 0, pos;
	clrscr();
	while(ch != 3)
	{
		cout<<"\n1. Insert element.\n2. Display Addition.\n3.
Exit\nEnter your choice : ";
		cin>>ch;
		switch(ch)
		{
			case 1:
				cout<<"\nEnter element in 1st array : ";
				cin>>x;
				cout<<"\nEnter element in 2nd array : ";
				cin>>y;
				insert(x, y);
				break;

			case 2:
				display();
				break;

			case 3:
				cout<<"\nProgram stoped...";
				break;
		}
	}
```

```
getch();
}

void insert(int x, int y)
{
        if(c < m*n)
        {
                a[c/n][c%n] = x;
                b[c/n][c%n] = y;
                c++;
        }
        else
        {
                cout<<"\nArray out of index...\n";
        }
}

void display()
{
        int i, j;
        for(i=0; i<=m-1; i++)
        {
                for(j=0; j<=n-1; j++)
                {
                        cout<<a[i][j] + b[i][j]<<"\t";
                }
                cout<<"\n";
        }

        c = 0;
}
```


6) Write a program to find subtraction of two matrices.

```
#include<iostream.h>
#include<conio.h>
#define m 2
```

```
#define n 2

int a[m][n], b[m][n], c = 0;
void insert(int, int);
void display();

void main()
{
	int x, y, ch = 0, pos;
	clrscr();
	while(ch != 3)
	{
		cout<<"\n1. Insert element.\n2. Display Subtraction.\n3.
Exit\nEnter your choice : ";
		cin>>ch;
		switch(ch)
		{
			case 1:
				cout<<"\nEnter element in 1st array : ";
				cin>>x;
				cout<<"\nEnter element in 2nd array : ";
				cin>>y;
				insert(x, y);
				break;

			case 2:
				display();
				break;

			case 3:
				cout<<"\nProgram stoped...";
				break;
		}
	}
getch();
}

void insert(int x, int y)
{
```

```
        if(c < m*n)
        {
                a[c/n][c%n] = x;
                b[c/n][c%n] = y;
                c++;
        }
        else
        {
                cout<<"\nArray out of index";
        }
}

void display()
{
        int i, j;
        for(i=0; i<=m-1; i++)
        {
                for(j=0; j<=n-1; j++)
                {
                        cout<<a[i][j] - b[i][j]<<"\t";
                }
                cout<<"\n";
        }

        c = 0;
}
```

7) Write a program to find multiplication of two matrices.

```
#include<iostream.h>
#include<conio.h>
#define m 2
#define n 2

int a[m][n], b[m][n], c = 0;
void insert(int, int);
void display();
```

```
void main()
{
	int x, y, ch = 0, pos;
	clrscr();
	while(ch != 3)
	{
		cout<<"\n1. Insert element.\n2. Display Multiplication.\n3.
Exit\nEnter your choice : ";
		cin>>ch;
		switch(ch)
		{
			case 1:
				cout<<"\nEnter element in 1st array : ";
				cin>>x;
				cout<<"\nEnter element in 2nd array : ";
				cin>>y;
				insert(x, y);
				break;

			case 2:
				display();
				break;

			case 3:
				cout<<"\nProgram stoped...";
				break;
		}
	}
getch();
}

void insert(int x, int y)
{
	if(c < m*n)
	{
		a[c/n][c%n] = x;
		b[c/n][c%n] = y;
		c++;
```

```
        }
        else
        {
                cout<<"\nArray out of index";
        }
}

void display()
{
        int i, j, k, s = 0;
        for(i=0; i<=m-1; i++)
        {
                for(j=0; j<=n-1; j++)
                {
                        s = 0;
                        for(k=0; k<=m-1; k++)
                        {
                                s = s + a[i][k] * b[k][j];
                        }
                        cout<<s<<"\t";
                }
                cout<<"\n";
        }

        c = 0;
}
```
