ASSIGNMENT 5: pointers in C++
DATE: 24/03/2021 Wednesday

CODE:

```
#include <iostream>
#include <string>
using namespace std;

//PASSING POINTERS TO FUNCTIONS
void swap(int* a, int* b)
{
   int temp;
   temp = *a;
   *a = *b;
   *b = temp;
}

 //FUNCTION POINTERS
 void displayVal(int a)
{
   printf("Value of a is %d\n", a);
}

int main()
 {
     //POINTER ARITHMETIC
     {
         cout<<"POINTER ARITHMETIC\n";
   int myarray[5] = {2, 4,6, 8,10};
   int* myptr;
   myptr = myarray;
   cout<<"First element in the array :"<<*myptr<<endl;
   myptr ++;
   cout<<"next element in the array :"<<*myptr<<endl;
   myptr +=1;
   cout<<"next element in the array :"<<*myptr<<endl;
   myptr--;
   cout<<"next element in the array :"<<*myptr<<endl;
   myptr -= 1;
   cout<<"next element in the array :"<<*myptr<<endl;
   cout<<"\n\n";
     }
```

```
    //NULL & VOID POINTERS
    {
        cout<<"NULL & VOID POINTERS\n";
  int intvar = 10;
  char c = 'A';
  void* vptr;

  int* myptr = NULL;

  cout<<"NULL pointer value :"<<myptr<<endl;

  vptr = &c;
  char* charptr;
  charptr = (char*)vptr;
  cout<<"Void pointer vptr points to:"<<*charptr<<endl;

  int* intptr;
  vptr = &intvar;
  intptr = (int*)vptr;
  cout<<"Void pointer vptr points to:"<<*intptr;
  cout<<"\n\n";
}

    //ARRAYS & POINTERS
    {
        cout<<"ARRAYS & POINTERS\n";
  int myarray[5] = {1, 1, 2, 3, 5};
  int* ptrvar;
  ptrvar = myarray;

  for(int i=0;i<5;i++)
    {
      cout<<*ptrvar<<"\t";
      ptrvar++;
    }

   cout<<"\n\n";
}

    //ARRAY OF POINTERS
    {
        cout<<"ARRAY OF POINTERS\n";
  int myarray[5] = {2,4,6,8,10};
```

```
  int *ptr[5]; //array of pointers
  for(int i=0;i<5;i++){
    ptr[i] = &myarray[i];
  }

  for (int i = 0; i < 5; i++)
  {
    cout << "Value of myarray[" << i << "] = ";
    cout << *ptr[i] << endl;
  }

  cout<<"\n\n";
}

   //POINTER OF POINTERS
   {
      cout<<"POINTER OF POINTERS\n";
  int *vptr;
  int ** intptr;
  int var = 10;
  vptr = &var;
  intptr = &vptr;

  cout<<"Variable var: "<<var<<endl;
  cout<<"Pointer to Variable: "<<*vptr<<endl;
  cout<<"Pointer to Pointer to a variable: "<<**intptr;

  cout<<"\n\n";
}

   //PASSING POINTERS TO FUNCTIONS
   {
      cout<<"PASSING POINTERS TO FUNCTIONS\n";
  int a, b;
  cout<<"Enter the values to be swapped: "; cin>>a>>b;
  cout<<"a = "<<a<<"\t"<<"b = "<<b;
  swap(&a,&b);
  cout<<endl;
  cout<<"Swapped values"<<endl;
  cout<<"a = "<<a<<"\t"<<"b = "<<b;

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

```
    //FUNCTION POINTERS
    {
        cout<<"FUNCTION POINTERS\n";
   void (*func_ptr)(int) = &displayVal;
   (*func_ptr)(100);
}


   return 0;
 }
```

OUTPUT:

```
POINTER ARITHMETIC
First element in the array :2
next element in the array :4
next element in the array :6
next element in the array :4
next element in the array :2


NULL & VOID POINTERS
NULL pointer value :0
Void pointer vptr points to:A
Void pointer vptr points to:10

ARRAYS & POINTERS
1       1       2       3       5

ARRAY OF POINTERS
Value of myarray[0] = 2
Value of myarray[1] = 4
Value of myarray[2] = 6
Value of myarray[3] = 8
Value of myarray[4] = 10


POINTER OF POINTERS
Variable var: 10
Pointer to Variable: 10
Pointer to Pointer to a variable: 10

PASSING POINTERS TO FUNCTIONS
Enter the values to be swapped: 42 97
a = 42  b = 97
Swapped values
a = 97  b = 42
```

```
FUNCTION POINTERS
Value of a is 100


...Program finished with exit code 0
Press ENTER to exit console.
```