Assignment9.cpp

```cpp
// Max Heap in C++

   #include <iostream>
   using namespace std;

   void heapify(int arr[], int n, int i) {
    // Find largest among root, left child and right child
    int largest = i;
    int left = 2 * i + 1;
    int right = 2 * i + 2;

    if (left < n && arr[left] > arr[largest])
    largest = left;

    if (right < n && arr[right] > arr[largest])
    largest = right;

    // Swap and continue heapifying if root is not largest
    if (largest != i) {
    swap(arr[i], arr[largest]);
       heapify(arr, n, largest);
    }
   }

   // main function to do heap sort
   void heapSort(int arr[], int n) {
    // Build max heap
    for (int i = n / 2 - 1; i >= 0; i--)
    heapify(arr, n, i);

    // Heap sort
    for (int i = n - 1; i >= 0; i--) {
    swap(arr[0], arr[i]);

    // Heapify root element to get highest element at root again
    heapify(arr, i, 0);
    }
   }

   // Print an array
   void printArray(int arr[], int n) {
    for (int i = 0; i < n; ++i)
    cout << arr[i] << " ";
    cout << "\n";
   }

   // Driver code
   int main() {
    int n;
    cout<<"Enter length of array: "<<endl;
```

```
    cin>>n;
    int arr[n];
    for(int i=0;i<n;i++){
        cout<<"Enter element "<<i+1<<": ";
        cin>>arr[i];
    }
    heapSort(arr, n);

    cout << "Sorted array is \n";
    printArray(arr, n);
   }

/*
Output:
Enter length of array:
5
Enter element 1: 34
Enter element 2: 23
Enter element 3: 65
Enter element 4: 76
Enter element 5: 3
Sorted array is
3 23 34 65 76

*/

```