

**Assignment # 2**

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Section: V1

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Course: Data Structures & Algorithms

**Question No. 1**

#include <iostream>

using namespace std;

int main(){

int arr[9]={-12,3,-15,2,-2,-10,9,7,-11};

int max=arr[0];

for (int x=0;x<9; x++){

for (int y=x+1;y<9;y++){

if (arr[x]\*arr[y] > max){

max=arr[x]\*arr[y];

}

}

}

cout <<"Max : " << max << endl;

}

**Question No. 2**

#include <iostream>

using namespace std;

class Node{

public:

int data ;

Node\*Next;

};

class linklist{

public:

Node\*Head;

Node\*n4;

Node\*n2;

Node\*n6;

Node\*n3;

Node\*n5;

Node\*n7;

void assign(){

Head = new Node();

n4 = new Node();

n2 = new Node();

n6 = new Node();

n3 = new Node();

Head->Next=n4;

cout << "Node 4: " ; cin >> n4->data;

n4->Next=n2;

cout << "\nNode 2: "; cin >> n2->data;

n2->Next=n6;

cout << "\nNode 6: " ; cin >> n6->data;

n6->Next=n3;

cout << "\nNode 5: "; cin >> n5->data;

n5->Next=NULL;

}

void searchList(){

int key;

cout <<"\nEnter number to search: " ; cin >> key;

bool check=false;

Node \*temp=Head;

if (temp==NULL){

cout <<"\nList is empty." << endl;

}

else {

while (temp!=NULL){

if (temp->data==key){

check=true;

}

temp=temp->Next;

}

}

if (!check){

cout <<"\nNumber doesn't exist in Linked List." << endl;

}

else {

cout <<"\nNumber Found!" << endl;

}

}

void printList(){

cout <<"\nLinked List: " ;

while (Head!=NULL){

cout << Head->data << " " ;

Head = Head->Next;

}

}

};

int main(){

linklist mylist;

mylist.assign();

mylist.searchList();

}

**Question No. 3**

#include <iostream>

using namespace std;

class Node {

public:

Node\*Next;

int data;

};

class linklist{

public:

Node \*Head,\*n4,\*n5,\*n6,\*n7;

void assignvalue(){

Head = new Node;

n4 = new Node();

n5 = new Node();

n6 = new Node();

n7 = new Node();

Head->Next=n4;

cout <<"Node 4: " ;

cin >> n4->data;

n4->Next=n5;

cout <<"\nNode 5: " ;

cin >> n5->data;

n5->Next=n6;

cout <<"\nNode 6: " ;

cin >> n6->data;

n6->Next=n7;

cout <<"\nNode 7: " ;

cin >> n7->data;

n7->Next=NULL;

}

void sortList(){

Node \*current=Head;

Node \*index;

int temp;

while (current != NULL){

index=current->Next;

while (index!=NULL){

if (current->data>index->data){

temp=current->data;

current->data=index->data;

index->data=temp;

}

index=index->Next;

}

current=current->Next;

}

}

void printList(){

Node \*temp=Head->Next;

cout <<"\nLinked List : " ;

while (Head->Next!=NULL){

cout <<Head->data << " " ;

Head=Head->Next;

}

}

};

int main(){

linklist mylist;

mylist.assignvalue();

mylist.sortList();

mylist.printList();

}

**Question No. 4**

#include <iostream>

using namespace std;

void sortArr(int arr[], int size){

int temp=arr[0];

for (int x=0;x<size; x++){

for (int y=x+1;y<size;y++){

if (arr[y]< arr[x]){

temp=arr[x];

arr[x]=arr[y];

arr[y]=temp;

}

}

}

};

int main(){

int size=9;

int target=15;

int arr[size]={2,1,3,5,7,8,10,11,10};

sortArr(arr , 9);

cout <<"Sort Array: " ;

for (int x=0;x<size;x++){

cout <<arr[x] << " ";

}

cout << endl <<endl;

bool check=false;

int num1,num2;

for (int low=0;low < size ; low ++ ){

for (int high =low+1; high < size ; high ++ ){

if (arr[low] + arr[high]==target){

num1=arr[low];

num2=arr[high];

check=true;

}

}

}

if (check){

cout <<num1 << " + " << num2 << " = " << " Target (" << target << ")" << endl;

}

else {

cout <<"Target not found! " << endl;

}

}

**Question No. 5**

#include <iostream>

using namespace std;

void sortArr(int arr[], int size){

int temp=arr[0];

for (int i=0;i<size; i++){

for (int j=i+1;j<size;j++){

if (arr[j]< arr[i]){

temp=arr[i];

arr[i]=arr[j];

arr[j]=temp;

}

}

}

};

int main(){

int size=10;

int arr[size]={7,8,6,9,2,5,1,4,11,16};

sortArr(arr,size);

cout <<"Sort Array: " ;

for (int i=0;i<size ;i++){

cout <<arr[i] << " ";

}

int i=0;

int j=size-1;

int k=0;

int A[10];

do {

A[k++]=arr[i++];

A[k++]=arr[j--];

} while (i<j);

cout <<"\n\nAuxiliary Array: " ;

for (int f=0;f<10 ; f++){

cout << A[f] << " ";

}

}

**Question No. 6**

#include <iostream>

using namespace std;

void bubbleSort(char arr[], int n){

char temp;

for (int x=0;x<n ; x++){

for (int y=x+1; y<n; y++){

if ( arr[y] < arr[x]){

temp=arr[y];

arr[y]=arr[x];

arr[y]=temp;

}

}

}

}

void selectionSort(char arr[], int n) {

int min;

int temp;

for (int x=0;x<n;x++){

min=x;

for (int y=x+1 ; y<n ; y++){

if (arr[y] < arr [min] ){

min=y;

}

}

temp=arr[x];

arr[x]=arr[min];

arr[min]=temp;

}

}

int main(){

int n=6;

char arr[n] = {'P', 'Y', 'T', 'H', 'O', 'N'};

cout <<"Your Array: " ;

for (int x=0; x <n ; x++){

cout <<arr[x] << " ";

}

bubbleSort(arr,n);

cout <<"\n\nBubble Sort : " ;

for (int x=0; x <n ; x++){

cout <<arr[x] << " ";

}

selectionSort(arr,n);

cout <<"\n\nSelection Sort : " ;

for (int x=0; x <n ; x++){

cout <<arr[x] << " ";

}

}

**Question No. 7**