1. Implement stack (the array based stack) given the following specification:

The array based stack class should contain only the following (max – top – the array itself)

The class should contain the following methods:

-push(int e): inserts an element.

-int pop(): removes and returns the last inserted element.

-int topE(): returns the last inserted element without removing it (data).

-boolean isEmpty(): indicates whether no elements are stored.

-boolean isFull(): indicates whether the stack full or not.

class StackArray

{

private int maxSize; // size of stack array

private long[] stackArray;

private int top; // top of stack

//--------------------------------------------------------------

public StackArray(int s) // constructor

{

maxSize = s; // set array size

stackArray = new long[maxSize]; // create array

top = -1; // no items yet

}

//--------------------------------------------------------------

public void push(long j) // put item on top of stack

{

If(top == maxSize - 1)

System.out.println(“Stack is full”);

stackArray[++top] = j; // increment top, insert item

}

//--------------------------------------------------------------

public long pop() // take item from top of stack

{

If(top == -1)

System.out.println(“Stack is empty”);

return stackArray[top--]; // access item, decrement top

}

//--------------------------------------------------------------

public long topE() // peek at top of stack

{

If(top == -1)

System.out.println(“Stack is empty”);

return stackArray[top];

}

//--------------------------------------------------------------

public boolean isEmpty() // true if stack is empty

{

return (top == -1);

}

//--------------------------------------------------------------

public boolean isFull() // true if stack is full

{

return (top == maxSize-1);

}

//--------------------------------------------------------------

} // end class StackArray