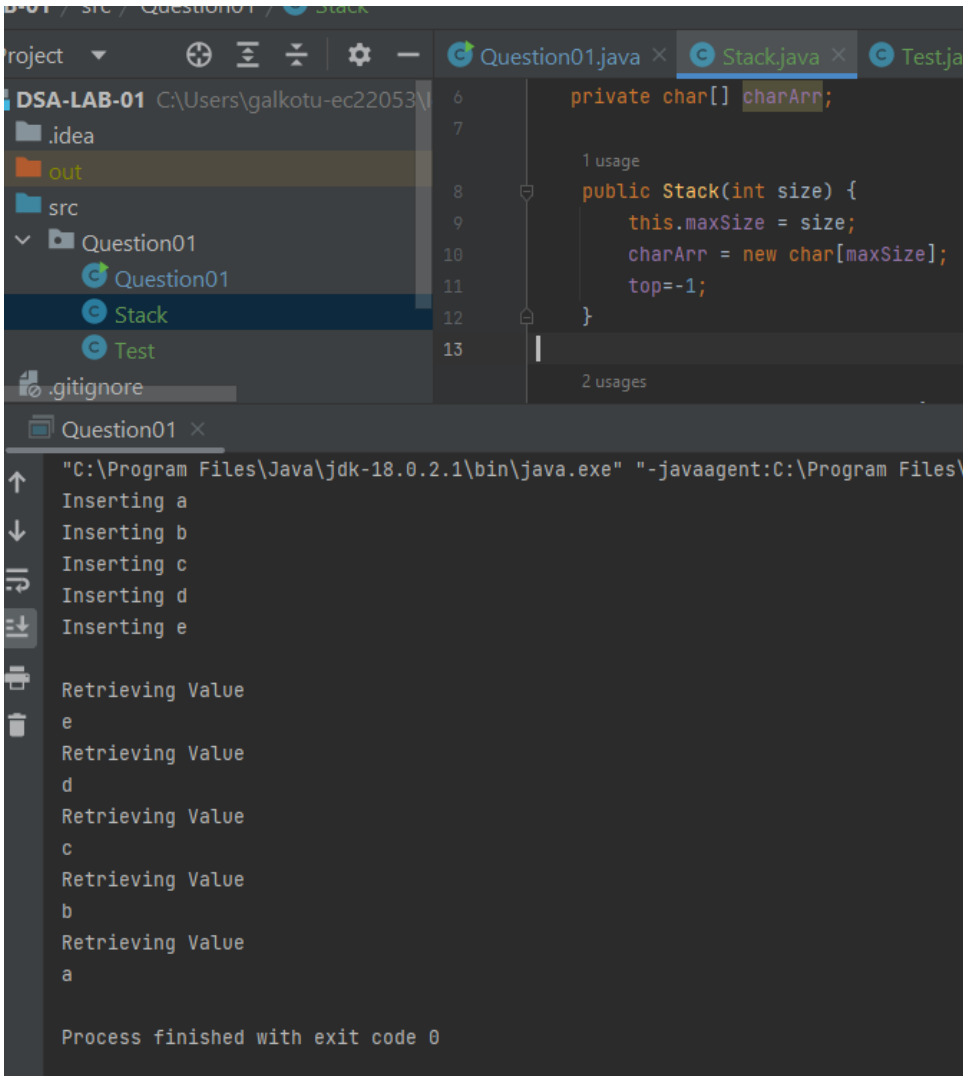
Question 01.

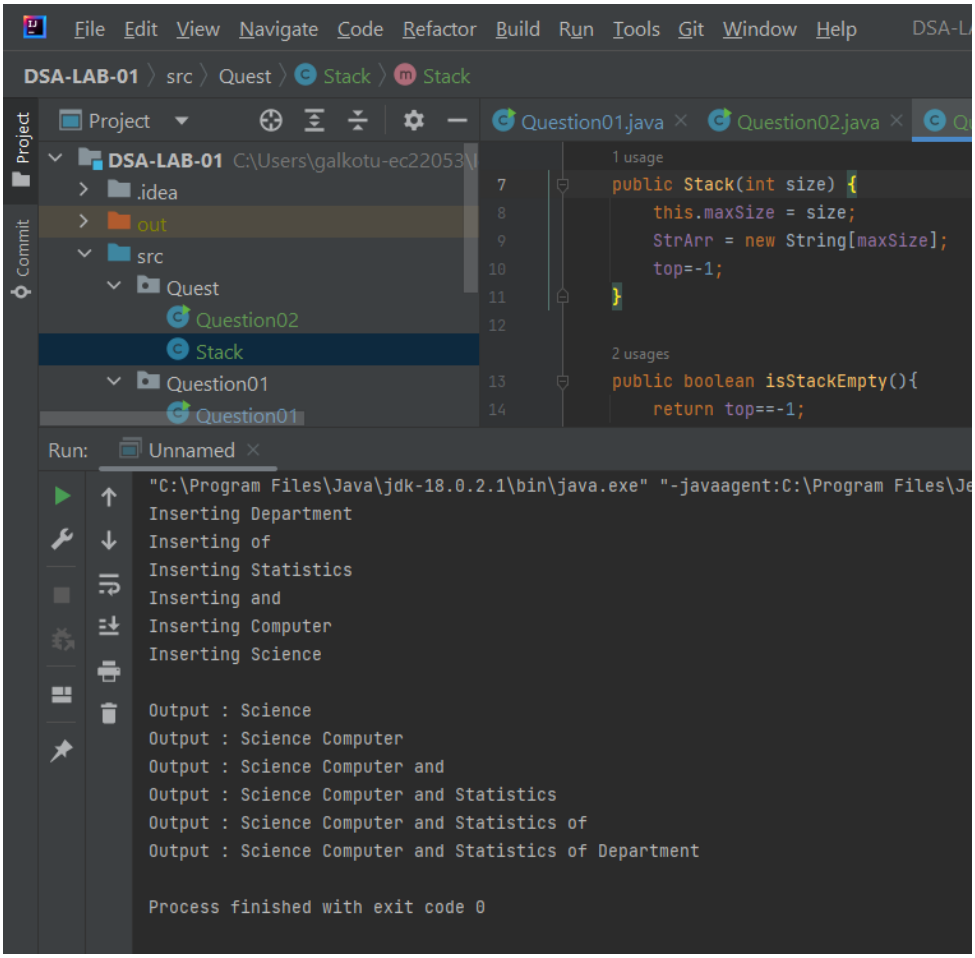
```
package Question01;
public class Question01 {
    public static void main(String[] args) {
        Stack stackS = new Stack(5);
        char wordArray[] = {'a','b','c','d','e'};
        for (char a: wordArray) {
            stackS.push(a);
        }
        System.out.println("");
        while (!stackS.isStackEmpty()){
            System.out.println(stackS.pop());
        }

    }
}
```



```
package Question01;

public class Stack {
    private int top;
   private int maxSize;
   private char[] charArr;

    public Stack(int size) {
        this.maxSize = size;
        charArr = new char[maxSize];
        top=-1;
    }

    public boolean isStackEmpty(){
        return top==-1;
    }


    public boolean isStackFull(){
        return top==maxSize-1;
    }

    public int getTop() {
        return top;
    }

    public void push(char newValue){
        if (isStackFull()){
            System.out.println("Stack Already Full");
        }
        else {
            System.out.println("Inserting "+newValue);
            charArr[++top] = newValue;
        }
    }

    public char pop(){
        if (isStackEmpty()){
            System.out.println("Stack is Already Empty");
            return charArr[top];
        }
        else {
            System.out.println("Retrieving Value");
            return charArr[top--];
        }
    }

}
```

Question 02.

```
package Question02;

public class Question02 {
    public static void main(String[] args) {
        Stack stackS = new Stack(6);
        String wordArray[] = {"Department", "of", "Statistics", "and",
"Computer", "Science"};
        for (String a : wordArray) {
            stackS.push(a);
        }
        System.out.println("");
        String fOut = "";
        while (!stackS.isStackEmpty()) {
            fOut += stackS.pop();
            fOut += " ";
            System.out.println("Output : " + fOut);
        }

    }
}
```



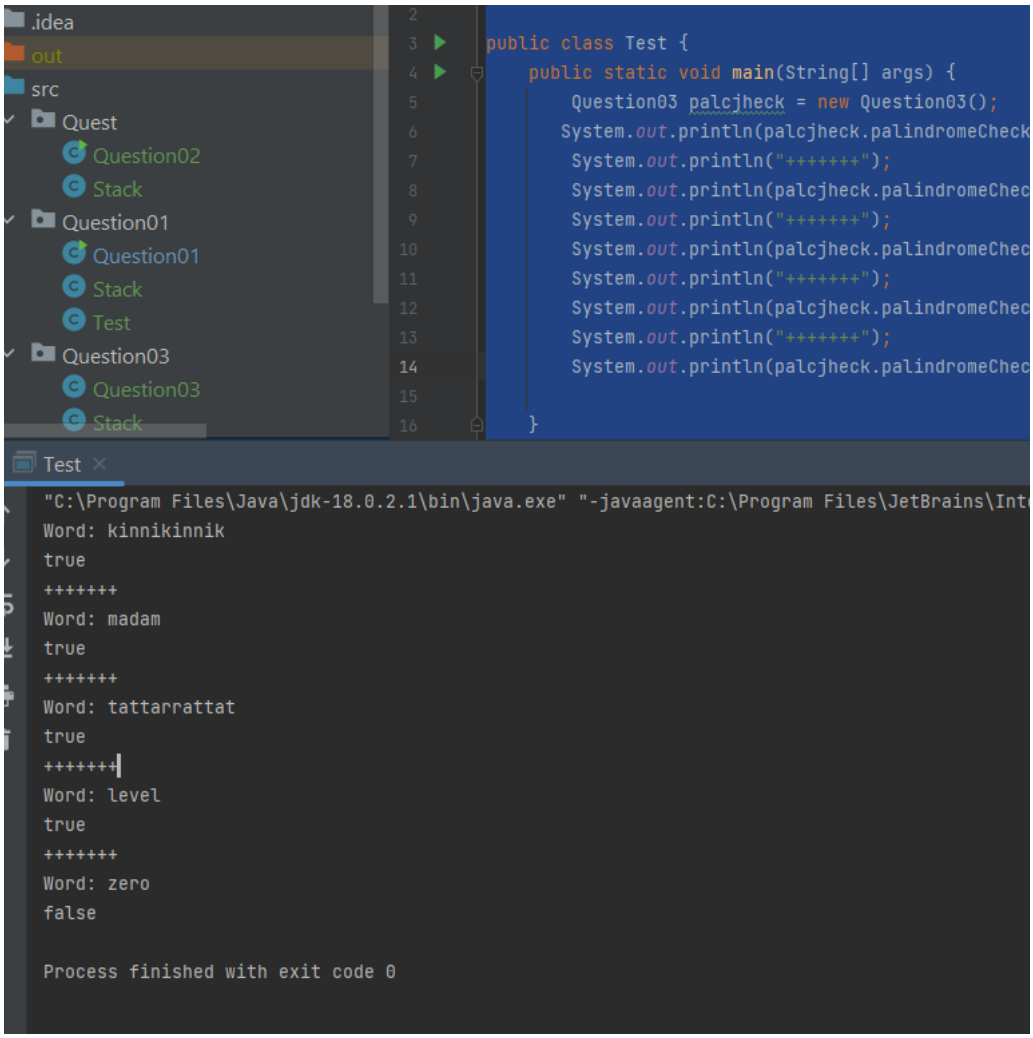
```
package Question02;
public class Stack {
    private int top;
    private int maxSize;
    private String[] StrArr;

    public Stack(int size) {
        this.maxSize = size;
        StrArr = new String[maxSize];
        top=-1;
    }

    public boolean isStackEmpty(){
        return top==-1;
    }


    public boolean isStackFull(){
        return top==maxSize-1;
    }

    public int getTop() {
        return top;
    }

    public void push(String newValue){
        if (isStackFull()){
            System.out.println("Quest.Question02.Stack Already Full");
        }
        else {
            System.out.println("Inserting "+newValue);
            StrArr[++top] = newValue;
        }
    }

    public String pop(){
        if (isStackEmpty()){
            System.out.println("Quest.Question02.Stack is Already Empty");
            return StrArr[top];
        }
        else {
            return StrArr[top--];
        }
    }
}
```

Question 03.

```
package Question03;

public class Question03 {

    public boolean IsPalindromeOrNot;
//    Write a program to check whether a given string is palindrome using Stack
Operations.
//    Example: madam, mom, rotator (Any word that reads the same forward or
backward)
    public boolean palindromeChecker(String obj) {
        char[] c = obj.toCharArray();
         Stack stackS = new Stack(c.length);
        for (char a:obj.toCharArray()){
            stackS.push(a);
        }
    System.out.println("Word: "+obj);
    while (!stackS.isStackEmpty()) {
        for (char a : obj.toCharArray()) {
            if (a != stackS.pop()) {
                IsPalindromeOrNot = false;
            } else {
                IsPalindromeOrNot = true;
            }

        }
    }

    return IsPalindromeOrNot;
    }

}
```

```
package Question03;
public class Stack {
    private int top;
    private int maxSize;
    private char[] charArr;

    public Stack(int size) {
        this.maxSize = size;
        charArr = new char[maxSize];
        top=-1;
    }

    public boolean isStackEmpty(){
        return top==-1;
    }


    public boolean isStackFull(){
        return top==maxSize-1;
    }

    public int getTop() {
        return top;
    }

    public void push(char newValue){
        if (isStackFull()){
            System.out.println("Stack Already Full");
        }
        else {
           // System.out.println("Inserting "+newValue);
            charArr[++top] = newValue;
        }
    }

    public char pop(){
        if (isStackEmpty()){
            System.out.println("Stack is Already Empty");
            return charArr[top];
        }
        else {
        //    System.out.println("Retrieving Value");
            return charArr[top--];
        }
    }

}
```

```
package Question03;

public class Test {
    public static void main(String[] args) {
        Question03 palcjheck = new Question03();
       System.out.println(palcjheck.palindromeChecker("kinnikinnik"));
        System.out.println("+++++++");
        System.out.println(palcjheck.palindromeChecker("madam"));
        System.out.println("+++++++");
        System.out.println(palcjheck.palindromeChecker("tattarrattat"));
        System.out.println("+++++++");
        System.out.println(palcjheck.palindromeChecker("level"));
        System.out.println("+++++++");
        System.out.println(palcjheck.palindromeChecker("zero"));

    }
}
```



Question 04.

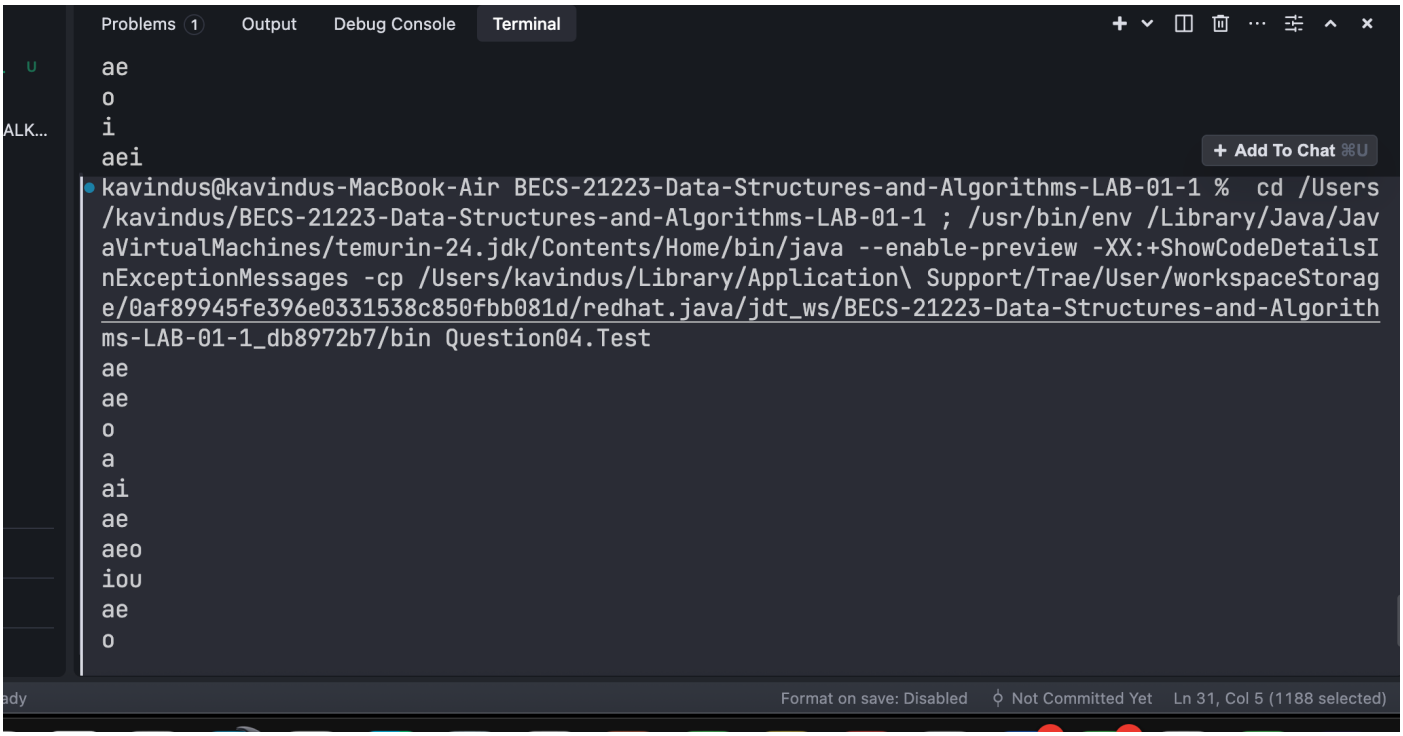
```
package Question04;
public class Stack {
    private int top;
    private int maxSize;
    private char[] charArr;

    public Stack(int size) {
        this.maxSize = size;
        charArr = new char[maxSize];
        top = -1;
    }

    public boolean isStackEmpty() {
        return top == -1;
    }

    public boolean isStackFull() {
        return top == maxSize - 1;
    }

    public int getTop() {
        return top;
    }

    public void push(char newValue) {
        if (isStackFull()) {
            System.out.println("Stack Already Full");
        } else {
            // System.out.println("Inserting "+newValue);
            charArr[++top] = newValue;
        }
    }
    @Override
    public String toString() {
        System.out.println(charArr);
        return charArr.toString();
    }
    public char pop() {
        if (isStackEmpty()) {
            System.out.println("Stack is Already Empty");
            return charArr[top];
        } else {
            // System.out.println("Retrieving Value");
            return charArr[top--];
        }}
}
```

```
package Question04;
import java.util.ArrayList;
import java.util.Collection;
public class Question04 {
    int aCount=0;
    int eCount=0;
    int iCount=0;
    int oCount=0;
    int uCount=0;
public void VowelChecker(String inpString){
    Stack stackForWord = new Stack(inpString.length());
    Stack stackForVowel = new Stack(inpString.length());
    char[] inpStringArray = inpString.toCharArray();
   for (char c : inpStringArray) {
    stackForWord.push(c);
   }
    ArrayList<Character> charArrayList = new ArrayList<>();
    for (char c : inpStringArray) {
        if (c=='a' && aCount == 0) {
            charArrayList.add(c);
            aCount++;
            } else if(c=='e'&& eCount==0){
                charArrayList.add(c);
                eCount++;
            } else if(c=='i'&& iCount==0){
                charArrayList.add(c);
                iCount++;
            } else if(c=='o'&& oCount==0){
                charArrayList.add(c);
                oCount++;
```

```
            } else if(c=='u'&& uCount==0){
                charArrayList.add(c);
                uCount++;
            }
        }
        java.util.Collections.sort(charArrayList);

    for (Character character : charArrayList.reversed()) {
        stackForVowel.push(character);
    }
    while (!stackForVowel.isStackEmpty()) {
        System.out.printf(stackForVowel.pop()+"");
    }
    System.out.println();
}
}
```

```
package Question04;

public class Test {
    public static void main(String[] args) {
      Question04 example01 = new Question04();
      Question04 example02 = new Question04();
      Question04 example03 = new Question04();
      Question04 example04 = new Question04();
      Question04 example05 = new Question04();
      Question04 example06 = new Question04();
      Question04 example07 = new Question04();
      Question04 example08 = new Question04();
      Question04 example09 = new Question04();
      Question04 example10 = new Question04();
```

```
        Question04 example11 = new Question04();
        Question04 example12 = new Question04();


        example01.VowelChecker("apple");     // Example 1
        example02.VowelChecker("zebra");     // Example 2
        example03.VowelChecker("school");    // Example 3
        example04.VowelChecker("banana");    // Example 4
        example05.VowelChecker("library");   // Example 5
        example06.VowelChecker("elephant"); // Example 6
        example07.VowelChecker("orange");    // Example 7
        example08.VowelChecker("unicorn");   // Example 8
        example09.VowelChecker("grape");     // Example 9
        example10.VowelChecker("python");    // Example 10
        example11.VowelChecker("kiwi");      // Example 11
        example12.VowelChecker("jasmine");   // Example 12
    }
}
```



Question 05.

```
package Question05;
public class Stack {
    private int top;
    private int maxSize;
    private String[] StrArr;

    public Stack(int size) {
        this.maxSize = size;
        StrArr = new String[maxSize];
        top=-1;
    }

    public boolean isStackEmpty(){
        return top==-1;
    }


    public boolean isStackFull(){
        return top==maxSize-1;
    }

    public int getTop() {
        return top;
    }

    public void push(int newValue){
        if (isStackFull()){
            System.out.println("Quest.Question02.Stack Already Full");
        }
        else {
            StrArr[++top] = String.valueOf(newValue);
        }
    }

    public String pop(){
        if (isStackEmpty()){
            System.out.println("Quest.Question02.Stack is Already Empty");
            return StrArr[top];
        }
        else {
            // System.out.println("Retrieving Value");
            return StrArr[top--];
        }

    }
}
```

```
package Question05;
public class StackString {
    private int top;
    private int maxSize;
    private String[] StrArr;

    public StackString(int size) {
        this.maxSize = size;
        StrArr = new String[maxSize];
        top=-1;
    }

    public boolean isStackEmpty(){
        return top==-1;
    }


    public boolean isStackFull(){
        return top==maxSize-1;
    }

    public int getTop() {
        return top;
    }

    public void push(String newValue){
        if (isStackFull()){
            System.out.println("Quest.Question02.Stack Already Full");
        }
        else {
            StrArr[++top] = String.valueOf(newValue);
        }
    }

    public String pop(){
        if (isStackEmpty()){
            System.out.println("Quest.Question02.Stack is Already Empty");
            return StrArr[top];
        }
        else {
            // System.out.println("Retrieving Value");
            return StrArr[top--];
        }

    }


}
```

```
package Question05;
public class Question05 {
    Stack stackforBin = new Stack(32);
    Stack stackforOctal = new Stack(18);
    StackString stack = new StackString(12);

    public void binaryConvert(int no){
        while(!(no==0)){
            stackforBin.push((char) (no%2));
            no /=2;
        }
        while (!stackforBin.isStackFull()){
            stackforBin.push(0);
        }
        while (!stackforBin.isStackEmpty()){
            System.out.printf(stackforBin.pop()+"");
        }
        System.out.println();
    }

    public void octalConvert(int no){
        while(!(no==0)){
            stackforOctal.push((char) (no%8));
            no /=8;
        }
        while (!stackforOctal.isStackFull()){
            stackforOctal.push(0);
        }
        while (!stackforOctal.isStackEmpty()){
            System.out.printf(stackforOctal.pop()+"");
        }
        System.out.println();

    }

    public void hexaConvert(int no) {
        while (!(no == 0)) {
            if (no % 16 == 10) {
                stack.push("A");
                no /= 16;
            } else if (no % 16 == 11) {
                stack.push("B");
                no /= 16;
            } else if (no % 16 == 12) {
                stack.push("C");
                no /= 16;
            } else if (no % 16 == 13) {
                stack.push("D");
```

```
                no /= 16;
            } else if (no % 16 == 14) {
                stack.push("E");
                no /= 16;
            } else if (no % 16 == 15) {
                stack.push("F");
                no /= 16;
            } else {
                stack.push(String.valueOf(no % 16));
                no /= 16;
            }
        }
            while (!stack.isStackFull()) {
                stack.push(String.valueOf(0));
            }
            while (!stack.isStackEmpty()) {
                System.out.printf(stack.pop() + "");
            }
            System.out.println();


    }
}
```

```
package Question05;

public class Test {
    public static void main(String[] args) {
        Question05 question05 = new Question05();
        question05.binaryConvert(77);
        question05.octalConvert(77);
        question05.hexaConvert(77);

    }

}
```