Exercise 1: Practice string methods
Write a java program to perform string methods by considering the given string inputs
String s1="Welcome to Java";
String s2=s1;
String s3=new String("Welcome to Java");
String s4=s1.intern();

• s1 = = s2	• s1.substring(3)
• s2 = = s3	• s1.substring(1, 3)
• s1.equalsIgnoreCase(s2)	• s1.startsWith("Wel")
• s2.equals(s3)	• s1.endsWith("Java")
• s1.compareTo(s2)	• s1.toLowerCase()
• s2.compareTo(s3)	• s1.toUpperCase()
• s1.equals(s2)	• " Hi".trim()
• s2 == s4	• s1.replace('o', 'O')
• s1 + s2	• s1.replaceAll("o", "O")
• s1.charAt(0)	• s1.replaceFirst("o", "O")
• s1.indexOf('j')	• s1.split("O")
• s1.indexOf("to")	• s1.split("O", 4)
• s1.lastIndexOf('a')	• s1.toCharArray()
• s1.lastIndexOf("o", 15)	• s1.codePointAt(0)
• s1.codePointCount(0, s1.length())	• s1.contains("or")
• s1.length()	• String.join("-", s1, s2, s3)

CODE:
```
import java.util.*;
class strIntro{
    public static void main(String[] args){
        System.out.println("R.Prabhakara Arjun\n2022503003\n");
        String s1="Java";
        String s2="Java";
        String s3=s2;
        String s4=new String("Java");
        String s5=new String("Java");
        String s6=new String("JaVa");
        String s7="Java Java va va";
        String s8="Abi 😊 !";
        System.out.println("s1==s2:"+(s1==s2));
        System.out.println("s1.equals(s2):"+s1.equals(s2));
        System.out.println("s2==s3:"+(s2==s3));
        System.out.println("s1.equals(s3):"+s1.equals(s3));
        System.out.println("s1==s4:"+(s1==s4));
        System.out.println("s1.equals(s4):"+s1.equals(s4));
        System.out.println("s4==s5:"+(s4==s5));
        System.out.println("s5.equals(s4):"+s5.equals(s4));
```

```java
        System.out.println("s1.equals(s6):"+s1.equals(s6));
        System.out.println("s1.equalsIgnoreCase(s6):"+s1.equalsIgnoreCase(s6));
        System.out.println("s1.compareTo(s6):"+s1.compareTo(s6));
        System.out.println("s1+s2:"+(s1+s2));
        System.out.println("s4+s5:"+(s4+s5));
        System.out.println("s1+s5:"+(s1+s5));
        System.out.println("s1.charAt(0):"+s1.charAt(0));
        System.out.println("s1.indexOf('a'):"+s1.indexOf('a'));
        System.out.println("s1.indexOf(\"av\"):"+s1.indexOf("av"));
        System.out.println("s7.lastIndexOf('a'):"+s7.lastIndexOf('a'));
        System.out.println("s7.lastIndexOf(\"av\"):"+s7.lastIndexOf("av"));
        System.out.println("s7.length():"+s7.length());
        System.out.println(s8+"s8.codePointCount(0,s8.length()):"+s8.codePointCount(0,s8.length()));
        System.out.println("s1.substring(3):"+s1.substring(3));
        System.out.println("s1.substring(3):"+s1.substring(1,3));
        System.out.println("s1.substring(3):"+s1.substring(0,s1.length()));
        System.out.println("s1.startsWith(\"Jav\"):"+s1.startsWith("Jav"));
        System.out.println("s1.endsWith(\"Jav\"):"+s1.endsWith("Jav"));
        System.out.println("s1.toLowerCase():"+s1.toLowerCase());
        System.out.println(s1);
        String s100=s1.toLowerCase();
        System.out.println(s100);
        System.out.println("s1.toUpperCase():"+s1.toUpperCase());
        System.out.println("\"    a-b-i    \":"+"    a-b-i    ".trim());
        String s99="Helooo hooo";
        //System.out.println("s99.replace('o',\"OoOo\"):"+s99.replace('o',"OoOo"));
        System.out.println("s99.replace('o',\"O\"):"+s99.replace('o','O'));
        System.out.println(s99);
        System.out.println("s99.replaceAll(\"o\",\"Ooo\"):"+s99.replaceAll("o","Ooo"));//takesboth as
string as a parameter!
        System.out.println("s99.replaceFirst(\"o\",\"Ooo\"):"+s99.replaceFirst("o","Ooo"));
        System.out.println("s99.split(\"o\"):"+s99.split("o"));
        String s98="Helooo hoooO";
        System.out.println("Arrays.toString(s99.split(\"o\")):"+(Arrays.toString(s99.split("o"))));
        System.out.println("Arrays.toString(s98.split(\"o\")):"+(Arrays.toString(s98.split("o"))));
        System.out.println("Arrays.toString(s98.split(\"o\",4)):"+(Arrays.toString(s98.split("o",4))));

System.out.println("Arrays.toString(s98.split(\"o\",3)):"+(Arrays.toString(s98.split("o",3))));//limit is
atmost hence limit-1parts as split
        System.out.println("s1.toCharArray():"+(s1.toCharArray()));
        System.out.println("Array.toString(s1.toCharArrays()):"+Arrays.toString(s1.toCharArray()));
        System.out.println(s8+"s8.codePointAt(0):"+s8.codePointAt(0));
        System.out.println(s8+"s8.codePointAt(s8.length()-1):"+s8.codePointAt(s8.length()-1));
        System.out.println("s1.contains(s2):"+s1.contains(s2));
        System.out.println("String.join(\"-\",s1,s2,s3,s4,s5,s6):"+String.join("-",s1,s2,s3,s4,s5,s6));
    }
}
```

```
PS C:\Users\2022503003\JAVA\week-5> java strIntro
R.Prabhakara Arjun
2022503003

s1==s2:true
s1.equals(s2):true
s2==s3:true
s1.equals(s3):true
s1==s4:false
s1.equals(s4):true
s4==s5:false
s5.equals(s4):true
s1.equals(s6):false
s1.equalsIgnoreCase(s6):true
s1.compareTo(s6):32
s1+s2:JavaJava
s4+s5:JavaJava
s1+s5:JavaJava
s1.charAt(0):J
s1.indexOf('a'):1
s1.indexOf("av"):1
s7.lastIndexOf('a'):14
s7.lastIndexOf("av"):6
s7.length():15
Abi?!s8.codePointCount(0,s8.length()):5
s1.substring(3):a
s1.substring(3):av
s1.substring(3):Java
s1.startsWith("Jav"):true
s1.endsWith("Jav"):false
s1.toLowerCase():java
Java
java
s1.toUpperCase():JAVA
"     a-b-i     ":a-b-i
s99.replace('o',"O"):HelOOO hOOO
HelOoo hOoo
s99.replaceAll("o","Ooo"):HelOooOooOoo hOooOooOoo
s99.replaceFirst("o","Ooo"):HelOoooo hooo
s99.split("o"):[Ljava.lang.String;@e9e54c2
Arrays.toString(s99.split("o")):[Hel, , , h]
Arrays.toString(s98.split("o")):[Hel, , , h, , , O]
Arrays.toString(s98.split("o",4)):[Hel, , , hoooO]
Arrays.toString(s98.split("o",3)):[Hel, , o hoooO]
s1.toCharArray():[C@1b28cdfa
s1.toCharArray():[C@1b28cdfa
Array.toString(s1.toCharArrays()):[J, a, v, a]
Abi?!s8.codePointAt(0):65
Abi?!s8.codePointAt(s8.length()-1):33
s1.contains(s2):true
String.join("-",s1,s2,s3,s4,s5,s6):Java-Java-Java-Java-Java-JaVa
PS C:\Users\2022503003\JAVA\week-5> []
```

Exercise 2: String reverse
Write a java program to read the string and displays the reverse of the string.
Hint: swap first character with last character until half of the string length

CODE:
```java
import java.util.*;
class reverseString{
    public static void main(String[] args){
        System.out.println("R.Prabhakara Arjun\n2022503003\n");
        Scanner input=new Scanner(System.in);
        System.out.print("Enter input string!!");
        String s2=input.nextLine();
        String s1="Hello world";
        String rev="";
        for(char c:s2.toCharArray()){
```

```
        rev=c+rev;
    }
    System.out.println("STRING:"+s2+"\nREVERSED STRING:"+rev);
  }
}
```

Exercise 3: Letter occurence

Write a java program to count the number of occurrence of the each letter in the given string using single array
Hint: int index = 'b' - 'a'; // indicates index 1
int index = 'c' - 'a'; // indicates index 2
countChar[index]++;

CODE:

```java
import java.util.*;
class frequency{
   public static void main(String[] args){
      System.out.println("R.Prabhakara Arjun\n2022503003\n");
      Scanner input=new Scanner(System.in);
      System.out.print("Enter input string!!");
      String s2=input.nextLine();
      //String s1="Hello world";
      int[] arrFreq=new int[26];
      //System.out.println(Arrays.toString(arrFreq));
      for(char c:s2.toLowerCase().toCharArray()){
         if(c>='a' && c<='z'){
            int index=c-'a';
            arrFreq[index]++;
         }
      }
      char[] alpha="abcdefghijklmnopqrstuvwxyz".toCharArray();
      System.out.print("\n[");
      for(char c:alpha){
         System.out.print(c+", ");
      }
      System.out.print("]\n");
      System.out.print(Arrays.toString(arrFreq));
   }
}
```

Exercise 4: string extraction

Write a java program that extracts all numbers from a given string and returns them as a new string.
For example, "a1b2c3" should return "123"

CODE:
```java
import java.util.*;
class stringExtraction{
    public static void main(String[] args){
        System.out.println("R.Prabhakara Arjun\n2022503003\n");
        Scanner input=new Scanner(System.in);
        System.out.print("Enter input string!!");
        String s2=input.nextLine();
        //String s1="123abc456";
        String str="";
        for(char c:s2.toCharArray()){
            if(Character.isDigit(c)){
                str=str+c;
            }
        }
        System.out.println(str);
    }
}
```

Excercise 5: Compression

Write a Java program that performs string compression using the counts of repeated characters.
Example string "aabcccccaaa" would become "a2b1c5a3".
If the "compressed" string would not become smaller than the original string, return the original
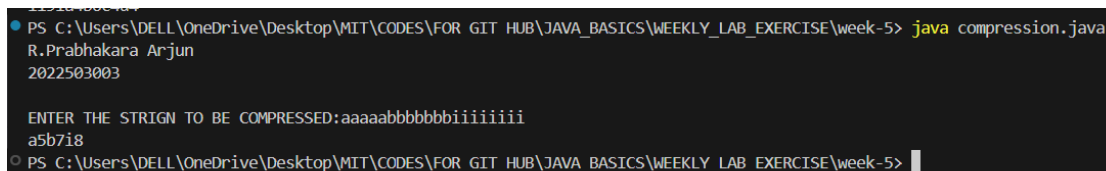string.

CODE:
```java
import java.util.*;
class strIntro{
    public static void main(String[] args){
        System.out.println("R.Prabhakara Arjun\n2022503003\n");
        //String s1="aabbcccdddaabbccccc";
        Scanner input=new Scanner(System.in);
        System.out.print("ENTER THE STRIGN TO BE COMPRESSED:");
```

```java
        String s1=input.nextLine();
        String finale="";
        int i=0;
        while(i<s1.length()){
            char curchar=s1.charAt(i);
            int count=0;
            while(i<s1.length() && s1.charAt(i)==curchar){
                count++;
                i++;
            }
            finale+=curchar;
            finale+=count;
        }
        if(finale.length()>s1.length()){
            System.out.println(s1);
        }
        else{
            System.out.println(finale);
        }


    }
}
```

Exercise 6: Anagram
Write a java program to check the given string is Anagram or not
Example1 : Listen vs Silent
Example 2 : The Morse Code vs Here Come Dots

CODE:
```java
import java.util.*;
class anagram{
    public static void main(String[] args){
        System.out.println("R.Prabhakara Arjun\n2022503003\n");
        /*String s1="abi is beautiful";
        String s2="beautiful is abi arjun";*/
        //I AM LORD VLODEMORT-------->TOM MARVOLO RIDDLE
        Scanner input=new Scanner(System.in);
        System.out.print("ENTER STRING1:");
        String s1=input.nextLine();
        System.out.print("ENTER STRING2:");
        String s2=input.nextLine();
        char[] a=s1.replace(" ","").toCharArray();
        char[] b=s2.replace(" ","").toCharArray();
        System.out.println(Arrays.toString(a)+"\n"+Arrays.toString(b));
        Arrays.sort(a);
```

```java
      Arrays.sort(b);
      System.out.println(Arrays.toString(a)+"\n"+Arrays.toString(b));
      if(Arrays.toString(a).length()!=Arrays.toString(b).length()){
        System.out.println("Not an anagram");
      }
      else if(Arrays.toString(a).equals(Arrays.toString(b))){
        System.out.println("Is a anagram");
      }
      else{
        System.out.println("Not an anagram");
      }
    }
  }
}
```

```
PS C:\Users\DELL\OneDrive\Desktop\MIT\CODES\FOR GIT HUB\JAVA_BASICS\WEEKLY_LAB_EXERCISE\week-5> java anagram.java
R.Prabhakara Arjun
2022503003

ENTER STRING1:i am lord voldemort
ENTER STRING2:tom marvolo riddle
[i, a, m, l, o, r, d, v, o, l, d, e, m, o, r, t]
[t, o, m, m, a, r, v, o, l, o, r, i, d, d, l, e]
[a, d, d, e, i, l, l, m, m, o, o, o, r, r, t, v]
[a, d, d, e, i, l, l, m, m, o, o, o, r, r, t, v]
Is a anagram
```

Exercise 7: Comparison of product version number
Write a java program that read a two string of the given format and compares the string
Example:
15.10.10 is greater than 14.20.50 as 15 >14
14.12.10 is greater than 14.10.55 as 12>10
14.10.15 is greater than 14.10.11 as 15>11

CODE:
Hint: GivenString.import java.util.*;
```java
class productVersionComparison{
  public static void main(String[] args){
    System.out.println("R.Prabhakara Arjun\n2022503003\n");
    Scanner input=new Scanner(System.in);
    System.out.println("x.x.x(kindly enter number in this format!)");
    System.out.print("ENTER STRING1:");
    String s1=input.nextLine();
    System.out.print("ENTER STRING2:");
    String s2=input.nextLine();
    //String s1="12.13.14";
    //String s2="12.13.14";
    String[] a=s1.split("\\.");
    String[] b=s2.split("\\.");
    System.out.println(Arrays.toString(a));
    System.out.println(Arrays.toString(b));
    if(a.length!=b.length){
      System.out.println("No comparisons can be mad bruh!!");
      return;
    }
    for(int i=0;i<a.length;i++){
      if(Integer.parseInt(a[i])>Integer.parseInt(b[i])){
        System.out.println(s1+" is greater!");
```

```
            return;
        }
        else if(Integer.parseInt(a[i])<Integer.parseInt(b[i])){
            System.out.println(s2+" is greater!");
            return;
        }
    }
    System.out.println(s1+" is equal to "+s2);
}
}split("\\."). Store each split part in an array and compare
```

```
 PS C:\Users\DELL\OneDrive\Desktop\MIT\CODES\FOR GIT HUB\JAVA_BASICS\WEEKLY_LAB_EXERCISE\week-5> java productVersionComparison.java
 R.Prabhakara Arjun
 2022503003

 x.x.x(kindly enter number in this format!)
 ENTER STRING1:12.13.15
 ENTER STRING2:12.14.10
 [12, 13, 15]
 [12, 14, 10]
 12.14.10 is greater!
```

Exercise 8: Email validity

Write a java program to compare the email is valid is invalid and retruns the username and domain name

i) Valid Username: numbers[0-9], alphabets[a-z][A-Z], underscore, hypen and plus characters .
Total number of characters are 25.
ii) Presence of single @ symbol
iii) Presence of domain name .com, .in, .edu

CODE:

```java
import java.util.*;
class emailValidity{
    public static void main(String[] args){
        System.out.println("R.Prabhakara Arjun\n2022503003");
        Scanner input=new Scanner(System.in);
        System.out.print("ENTER STRING1:");
        Boolean[] boo={false,false,false,false,false,false,false};
        String s1="Arjun_1-sfdfds910@hamil.com";
        System.out.println(Arrays.toString(boo));
        if(s1.length()>=25){
            boo[boo.length-1]=true;
        }
        if(s1.contains("_")){
            boo[boo.length-2]=true;
        }
        if(s1.contains("-")){
            boo[boo.length-3]=true;
        }
        if (s1.lastIndexOf('@')==s1.indexOf('@')) {
            boo[boo.length - 4] = true;
        }
        if(s1.endsWith(".com")||s1.endsWith(".in")||s1.endsWith(".edu")){
            boo[boo.length-5]=true;
        }
        if(s1.matches(".*\\d.*")){
            boo[0]=true;
        }
```

```java
        if(s1.matches(".*[a-zA-Z].*")){
            boo[1]=true;
        }
        System.out.println(Arrays.toString(boo));
        String[] messages = {
            "The string must contain at least one number.",
            "The string must contain at least one alphabet.",
            "The string must end with .com, .in, or .edu.",
            "The string must contain exactly one '@' symbol.",
            "The string must contain a '-' character.",
            "The string must contain an '_' character.",
            "The string must be at least 25 characters long."
        };
        int i = 0;
        Boolean flag=true;
        while (i < boo.length) {
            if (!boo[i]) {
                System.out.println("Constraint failed: " + messages[i]);
                flag=false;
            }
            i++;
        }
        if(flag){
            String[] a=s1.split("@");
            System.out.println("The username is "+a[0]+"\nThe doamin name is "+a[1]);
        }
        else{
            System.out.println("RUN THE PROGRAM AGAIN!!");
        }

    }
}
```
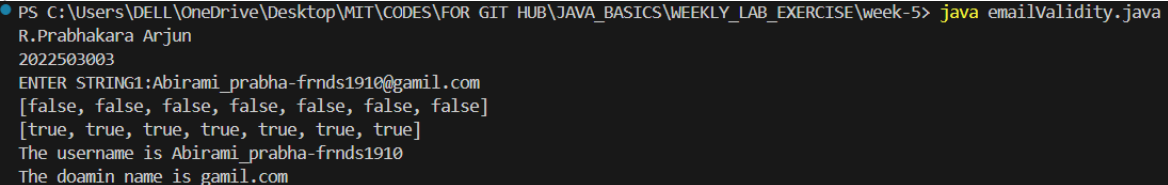
```
PS C:\Users\DELL\OneDrive\Desktop\MIT\CODES\FOR GIT HUB\JAVA_BASICS\WEEKLY_LAB_EXERCISE\week-5> java emailValidity.java
R.Prabhakara Arjun
2022503003
ENTER STRING1:Abirami_prabha-frnds1910@gamil.com
[false, false, false, false, false, false, false]
[true, true, true, true, true, true, true]
The username is Abirami_prabha-frnds1910
The doamin name is gamil.com
```

Exercise 9: Dictionary
Write a java program to create a dictionary using 2D string array any 10 programming languages.
Write a method that return the definition for the input of PL name.
Java- pure object oriented programming language by James Gosling

CODE:
```java
import java.util.*;
class dictionary{
    static String[][] dictionaryee = {
        {"Java", "Pure object-oriented programming language by James Gosling"},
        {"C++", "Object-oriented programming language by Bjarne Stroustrup"},
        {"Python", "High-level programming language by Guido van Rossum"},
        {"JavaScript", "High-level, interpreted scripting language primarily used in web development"},
        {"C", "General-purpose procedural programming language by Dennis Ritchie"},
        {"Ruby", "Dynamic, reflective, object-oriented language used for web applications"},
        {"Swift", "Powerful and intuitive programming language for iOS and macOS apps"},
```

```java
        {"Go", "Open-source programming language that makes it easy to build simple, reliable
software"},
        {"Rust", "Systems programming language focused on safety and concurrency"},
        {"PHP", "Server-side scripting language primarily used for web development"}
    };
    public static String getDef(String lang){
        for(int i=0;i<dictionaryee.length;i++){
            if(dictionaryee[i][0].equalsIgnoreCase(lang)){
                return dictionaryee[i][0]+"-->"+dictionaryee[i][1];
            }
        }
        return "LANG NOT FOUND!";
    }
    public static void main(String[] args){
        Scanner input=new Scanner(System.in);
        System.out.println("R.Prabhakara Arjun\n2022503003\n");
        System.out.print("ENTER THE LANG TO SEARCHED:");
        //String s1="java";
        String s1=input.nextLine();
        String def=getDef(s1);
        System.out.println(def);
    }
}
```

```
PS C:\Users\DELL\OneDrive\Desktop\MIT\CODES\FOR GIT HUB\JAVA_BASICS\WEEKLY_LAB_EXERCISE\week-5> java dictionary.java
R.Prabhakara Arjun
2022503003

ENTER THE LANG TO SEARCHED:php
PHP-->Server-side scripting language primarily used for web development
```