Dt : 21/9/2023

Summary : Object Oriented Programming features:

(a)Class

=>Class is a 'structured layout' generating Objects.

=>Based on Security:

(i)Mutable Classes

(ii)Immutable classes

(b)Object

=>Object is a storage related to a class holding Instance members of class.

=>Based on Security,Objects are categorized into two types:

(i)Mutable Objects

(ii)Immutable Objects

(c)Abstraction

=>The process of hiding the background implementation which is not needed by the EndUsers is known as 'Abstraction process'

=>we use "Interfaces" and "AbstractClasses" to perform abstraction process.

(d)Encapsulation

=>The process of binding all the programming components into a single unit class is known as "Encapsulation process".

=>Which means,Class is holding variables,methods,blocks,Constructors, InnerClases,InnerInterfaces,InnerAbstractClasses and Exception handling components like try,catch,finally,throw and throws.

(e)PolyMorphism

=>The process in which programming Components having more than one form is known as PolyMorphism.

(i)Dynamic PolyMorphism

=>Method Overriding process

(ii)Static PolyMorphism

=>Method Overloading process

=>Objects will have two forms:

(i)Mutable Objects

(ii)Immutable Objects

(f)Inheritance

=>The process of interlinking classes with "extends" keyword is known as Inheritance.

=>Types of Inheritances:

1.Single Inheritance

2.Multiple Inheritance

3.Multi-Level Inheritance

4.Hirarchal Inheritance

5.Hybrid Inheritance

=>According to realtime application development the Inheritances are categorized into two types:

1.Single Inheritance

2.Multiple Inheritance(Using Interfaces)

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**imp*

Strings in Java:

=>The sequenced collection of characters which are represented in double quotes is known as string.

Ex:

"nit","hyd",...

=>Each character in the string is organized based on index value.

=>strings in java are not Arrays.

=>we use the following classes from java.lang package to create string objects:

1.String class

2.StringBuffer class

3.StringBuilder class

1.String class:

=>The Objects which are created using "java.lang.String" class are

Immutable Objects.

=>we use the following two syntaxes to creates String-class Objects:

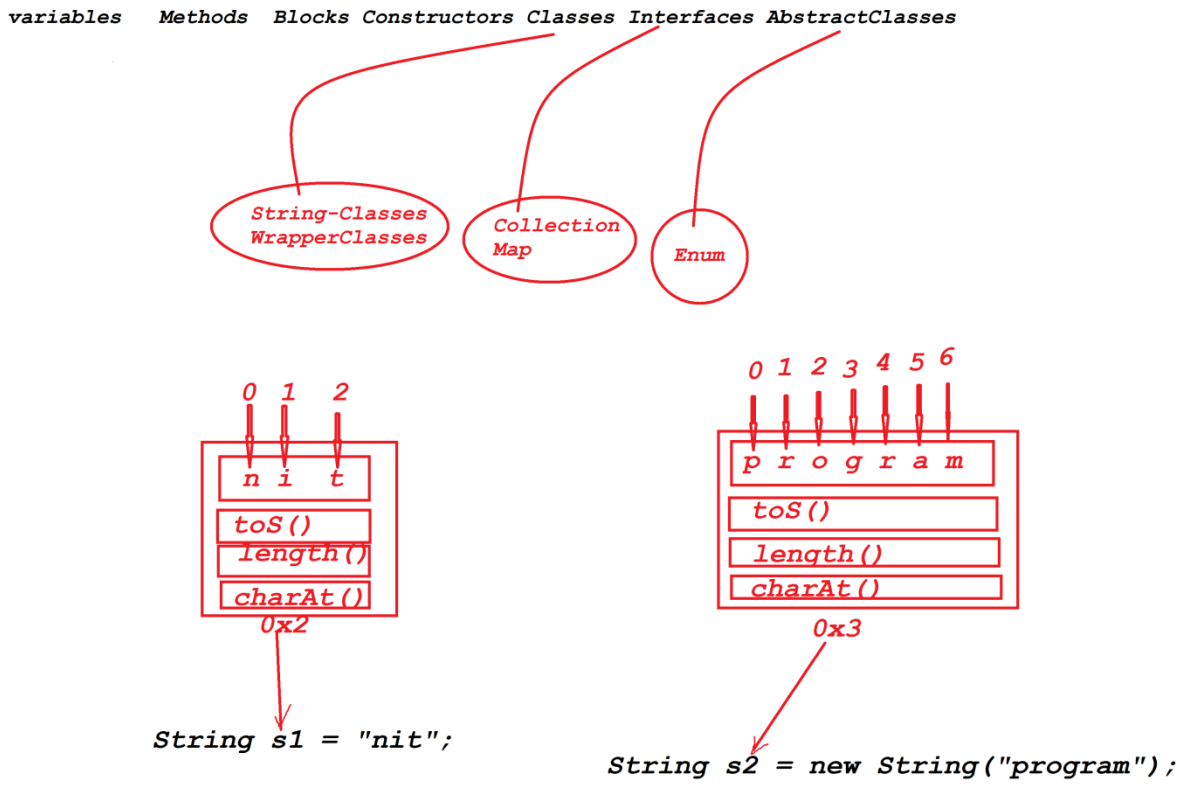
syntax-1 : using "String Literal process"

```
String s1 = "nit";
```

syntax-2 : using "new operator process"

```
String s2 = new String("program");
```

Diagrams:



Ex : DemoString1.java

```
package maccess;
```

```
public class DemoString1 {
    public static void main(String[] args) {
        String s1 = "nit";
        int len1 = s1.length();
        char ch1 = s1.charAt(1);
        System.out.println("****s1****");
        System.out.println("s1 : "+s1.toString());
        System.out.println("length of s1 : "+len1);
        System.out.println("char at index 1 : "+ch1);
        String s2 = new String("program");
        int len2 = s2.length();
        char ch2 = s2.charAt(3);
        System.out.println("****s2****");
        System.out.println("s2 : "+s2.toString());
        System.out.println("length of s2 : "+len2);
        System.out.println("char at index 3 : "+ch2);
    }
}
```

o/p:

*****s1*****

s1 : nit

length of s1 : 3

char at index 1 : i

*****s2*****

s2 : program

length of s2 : 7

char at index 3 : g

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faq:

define toString() method?

=>toString() method is used to display the content(data) from the Object.

=>toString() method is auto-executable method and which is executed automatically when we display object reference variable.

syntax:

```
String dt = obj.toString();
```

faq:

define length() method?

=>length() method is used to find the length of String.

syntax:

```
int len = str.length();
```

faq:

define charAt() method?

=>charAt() method is used to retrieve character from the string based on index value.

syntax:

```
char ch = str.charAt(index);
```

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Assignment:

wap to read a String and display the reverse of String?

i/p : str = "language"

o/p : egaugnal

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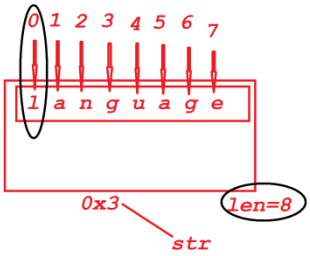
Ex-program:

wap to read a String and,display Vowels and Count of Vowels?

i/p : str = "language"

Vowels : a u a e

Count : 4




```
for(int i=0;i<=len-1;i++)
{
}
```

Program : DemoString2.java

```
package maccess;
import java.util.*;
public class DemoString2 {
    public static void main(String[] args) {
       Scanner s = new Scanner(System.in);
       try(s;) {
       System.out.println("Enter the String:");
```

```
        String str = s.nextLine();
        int len = str.length();
        int count=0;
        System.out.print("Vowels : ");
        for(int i=0;i<=len-1;i++)
        {
             char ch = str.charAt(i);//Char from index
             switch(ch)
             {
             case 'a':
             case 'A':
                  System.out.print(ch+" ");
                  count++;
                  break;
             case 'e':
             case 'E':
                  System.out.print(ch+" ");
                  count++;
                  break;
             case 'i':
             case 'I':
                  System.out.print(ch+" ");
                  count++;
                  break;
             case 'o':
             case 'O':
                  System.out.print(ch+" ");
                  count++;
                  break;
             case 'u':
             case 'U':
                  System.out.print(ch+" ");
                  count++;
                  break;
             }//end of switch
        }//end of loop
        System.out.println("\nCount of Vowels :
"+count);
       }//end of try with resource
    }
```

}

o/p:

Enter the String:

java language programming

Vowels : a a a u a e o a i

Count of Vowels : 9

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Assignment:

wap to raed a String and,display Consonents and count of Consonents?

Assignment:

Update above program displaying Vowels from the String,but display vowels only once.

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faq:

define ASCII code?

=>ASCII stands for 'American Standard Code for Information Interchange' and which is unique code generated for each key pressed from the keyboard.

UpperCase Alphabets(A-Z) : 65 to 90

LowerCase Alphabets(a-z) : 97 to 122

Numbers(0-9) : 48 to 57

Program : DemoString3.java

```
package maccess;
public class DemoString3
{
     public static void main(String[] args)
     {
          System.out.println("****UserCase Alphabets(A-
Z)****");
          for(int i=65;i<=90;i++)
          {
           char ch = (char)i;//ASCII code to Char
           System.out.print(ch+" ");
          }
          System.out.println("\n****LowerCase
Alphabets(a-z)****");
          for(int i=97;i<=122;i++)
          {
           char ch = (char)i;//ASCII code to Char
           System.out.print(ch+" ");
          }
          System.out.println("\n****Numbers(0-9)****");
          for(int i=48;i<=57;i++)
          {
           char ch = (char)i;//ASCII code to Char
           System.out.print(ch+" ");
          }

     }
}
```

o/p:

```
****UserCase Alphabets(A-Z)****

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

****LowerCase Alphabets(a-z)****
```

a b c d e f g h i j k l m n o p q r s t u v w x y z

*****Numbers(0-9)*****

0 1 2 3 4 5 6 7 8 9

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