Assignment - 1

Date :
Page :

Explain characteristic of JAVA. OR features of JAVA.
Features of Java.

Simple and Easy to learn: Java was designed to be easy to use and read, making it accessible for beginners.

Object - Oriented :- Java follows the object oriented programming paradigm, promoting modular and reusable code through classes and objects.

Platform independence: Java programs can run on any device with the Java virtual machine ensuring platform independence.

Distributed Computing: Java supports the development of distributed applications with its remote method invocation (RMI) and Java remote method protocol (JRMP) features.

Multithreading: Java provides built-in support for multithreading, allowing concurrent execution of multiple threads within a program.

Robust and Secure: With features like strong typing, automatic memory management, and a built-in security manager, Java emphasizes robustness and security.

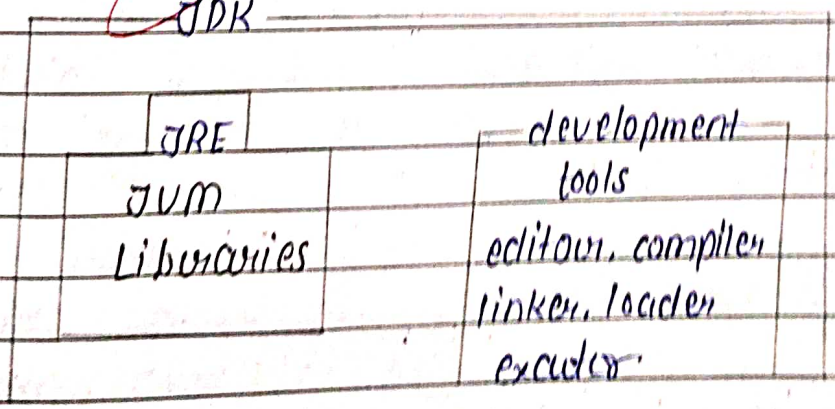
Rich and standard library: Java comes with a comprehensive standard library, providing pre-built packages and classes for various functionalities.

Date:
Page:

High performance: Java uses Just-In-Time (JIT) compilation, which translates bytecode into machine code at runtime, contributing to its performance.
Scalable: Java's modular architecture and support for distributed computing make it scalable for both small-scale and large-scale application.

Explain JDK, JVM, & JRE

1. JDK: It is a software development kit used to develop java applications.
It includes JRE, an interpreter a compiler, an archiever, documentation generator, and other tools needed for java development.



JDK = JRE + development tools + JVM
JRE = JVM + libraries.

Date:
Page:

JRE :- It provide an enviroment to the java program.
It internally contains JVM which is responsible to excute a java program.
JRE is one of the interrelated components in the JAVA development kit (JDK).

JVM :- It is a software in the form of interpreter written in 'C' language through which we can excute our java program.
It is a virtual machine that excute java bytecode.

Explain statement "public static void main (String args[])".
This statement is the entry point for a java program.

"public" indicates that the method is accessible from outside the class.
"static" means the method belongs to the class rather than an instance of the class.
"void" signifies that the method doesn't return any value.
"main" is the method name and serve as the starting point for the program exetution.
"string args[]" declears a parameters named "args" of type String array, allowing command-line argument to be passed to the program.

Date :
Page :

Explain different types of operators (augmented assignment, increment and decrement and logical operator).

Augmented assignment :- Augmented assignment operators are shorthand notations in programming, combining an operation with assignment. It is used to perform an operation and assign the result in concise way.

'+=' = Adds the right operand to the left operand.

'-=' → substract the right operand from the left operand.

'*=" → multiplies the left operand by the right operand.

'/=' → devides the left operand by the right operand.

'%=' → Compute the remainder when dividing the left operand by the right operand.

Increment and decrement :- It is used to increase or decrease the value of a variable by 1, respectively.

Increment operator (++) The ++ operator increment the value of variable by 1.

decrement operator (--) The -- operator decrese the value of variable by 1.

Date :
Page :

logical operatour : Logical operatours are used to peurfourm logical opeurations on boolean values. The purimary logical opeuratours are:
'&&' → (logical AND) - Returns tuue if both opeurands are tuue.
'||' (logical OR) - Returns tuue if at least one of the opeurands is tuue.
'!' (logical NOT) :- Returns the opposite boolean value of the opeurand.

Explain break and continue with example.
'Breaks' and 'continue' statements are used within loops to contuol the flow of execution.
'break' statement :- It is used to teurminate the neaurest enclosing loop (four, while, or do-while). After encountering a 'break' statement, the puoguram exists the loop, and the contuol is tuansfeurued to the statement following the loop.

```
four (int i=0; i<=5; i++){
    if (i==3){
        break; // exits the loop when i equals 3
}
    s.o.p (i);
}
```

2 'continue' statement :- It is used to skip the uest of the code inside a loop four the cuurent iteuration and move to the next iteuration.

Date :
Page :

After encountering a 'continue' statement, the remaining code within the loop for the current iteration is skipped.

```
for (int y=0; y<=6; y++){
    if (y==3){
        continue; // skip the code below for y=3
    }
    S.O.P(y);
}
```

difference between while and do...while with example.

while	do...while
In this, the given condition is evaluate first and then loop body is excuted.	1) In this, the given loop body is excuted first and then after the condition is checked.
It is an entry-controlled loop.	2. It is an exit-controlled loop.
The loop body would be executed only if the given condition is true.	3 The loop body would be excuted at least onece, even if the given condition is false.
No-semi colon is used as a part of syntax.	4. Semi-colon is used as a part of syntax.

Date :
Page :

it allows initialization of counter variable before entering loop body.	It allow initialization of counter variable before and after entering loop body.

for exa. int i=0;
while (i<5){
s.o.p(i);
i++;
}
	for exa int j=0;
	do {
	s.o.p(j);
	j++;
	}
	while (j<5);

Compare String with StringBuffer class.

String: object of the 'string' class are immutable meaning their values can not be changed after creation. Any operation that seems to modify a 'string' actually creates a new 'string' object.

```
string str = "Hello";
str = str + "World"; // creates a string
                        object.
```

StringBuffer :- 'stringbuffer' objects, on other hand, are mutable. You can modify the contents of 'string buffer' without creating a new object.

```
StringBuffer buffer = new StringBuffer("Hello");
buffer.append("World"); // modifies the
                           existing string buffer.
```

String :- concatenating or modifying 'string' objects can be less efficient because it involves creating new objects, if you need perform many modifications, this can lead to performance issue.

StringBuffer: Designed for efficient modification 'StringBuffer can be more efficient when concatenating or modifying text frequently.

String :- 'String' object are immutable, making them inherently thread-safe.

StringBuffer :- 'StringBuffer' provides method for synchronization, making it thread safe.

What is a Wrapper class in Java? Explain with an example.

A wrapper class is class that provides an object representation for primitive data types. This is useful when an object is needed, rather than a primitive type, as it allows you to perform various operations, such as using methods and compatibility with other Java classes that work with object.

Here's an example using the Integer wrapper class for the primitive data type 'int':

```
public class WrappeirExample {
    public static void main (String [] args) {
        int primtiveInt = 42;
```

Date :
Page :

```
Integer wrappedInt = Integer.valueOf(primitiveInt);
Integer result = wrappedInt + 10;
int unwrappedInt = wrappedInt.intValue();
S.O.P ("Primitive int :" + primitiveInt);
S.O.P ("wrapped Integer :" + wrappedInt);
S.O.P ("Result after operation :" + result);
S.O.P ("Unwrapped int :" + unwrappedInt);
}
}
```

Write a program that creates five integer element array. Calculate and display the average of its value using command line argument.

```
public class AverageCalculator {
public static void main (String[] args) {
// check if five command line argument are
    provided.
if (args.length != 5) {
    S.O.P ("please provide five integer values as
    command line arguments!");
    return ;
}
//create an array to store the command line argument
as integers.
    int[] numbers = new int[5];
// convert command line arguments to integers and store
in the array.
    for (int i = 0; i<5; i++) {
        try {
```

Date:
Page:

```
        numbers[i] = Integer.parseInt(args[i]);
    }
    catch (NumberFormatException e){
        S.o.p ("error: invalid integer provided.
        please provide valid integer:");
        return;
    }
    }
// calculate the sum of the array element
    int sum = 0;
    for (int number: numbers){
        sum += number;
    }
// calculate the average
    double average = (double) sum / numbers.length;

// display the results
        S.o.p ("Array element:" + java.util.Arrays.
                                toString(numbers));
    S.o.p("Average:" + average);
}
}
```

output :-

Explain String class and its function.

The string is a sequence of characters. In java, objects of string are immutable which means a constant and can not be changed once created.

Date:
Page:

String functions

int length():- Returns the number of the character in the string.

char charAt(int i):- Return the character at ith index.

String substring(int i):- Return the substring from the ith index character to end.

String concat(string str):- Concantenates specified string to the end of this string.

int indexof(string s):- Returns the indextwithin the string of the first occurance of the specified string.

Int compareto(string anotherstring): Compare two strings.

String tolowercase():- converts all the characters in the string to lower case.

String touppercase():- converts all characters in the string to uppercase.

6/2/24