School of Computer Science Engineering and Technology

Course- BTech   Type- Core
Course Code- **CSET109**   Course Name- **Object Oriented Programming Using Java**
Year- First   Semester- Even Batch- BTech 2nd Semester

Tutorial-9

Tutorial No.	Name	CO1	CO2	CO3
9	**Multithreading and File handling**	✓	✓	--

Objective: The main objective of this tutorial is to learn about the multithreading and file handling concepts of Java language.

9.1 What will be the output of the following program?

```java
public class IsItCorrect {
    public static void main(String[] args) throws InterruptedException {
        Runnable r = new Runnable() {
            public void run() {
                try {
                    Thread.sleep(1);
                } catch (InterruptedException e) {
                    System.out.print("Interrupted,");
                }
                System.out.print("Run,");
            }
        };
        Thread t = new Thread();
        t.run();
        System.out.print("Started,");
        t.start();
        System.out.print("Interrupting,");
        t.interrupt();
        System.out.print("Ended,");
    }
}
```

9.2 What will be the output of the following program?

```java
public class Test implements Runnable
{
    public void run()
    {
        System.out.printf("Hello ");
        System.out.printf("World");
    }
    public static void main(String[] args)
    {
        Test obj = new Test();
```

```
        Thread thread = new Thread(obj);

        thread.start();
        System.out.printf("World");
        try
        {
            thread.join();
        }
        catch (InterruptedException e)
        {
            e.printStackTrace();
        }
        System.out.println("for ");
    }
}
```

9.3 What will be the output of the following Java program?
```
    import java.io.*;
    class filesinputoutput
    {
        public static void main(String args[])
        {
            InputStream obj = new FileInputStream("inputoutput.java");
            System.out.print(obj.available());
        }
    }
```
Note: inputoutput.java is stored in the disk.

9.4 What will be the output of the following program?
```
import java.io.*;
    public class filesinputoutput
    {
        public static void main(String[] args)
        {
            String obj  = "abc";
        byte b[] = obj.getBytes();
        ByteArrayInputStream obj1 = new ByteArrayInputStream(b);
        for (int i = 0; i < 2; ++ i)
        {
            int c;
            while((c = obj1.read()) != -1)
            {
                    if(i == 0)
                {
                        System.out.print(Character.toUpperCase((char)c));
                    obj2.write(1);
                    }
            }
            System.out.print(obj2);
        }
```

```
        }
    }
```

9.5 What will be the output of the program?

```java
class MyThread extends Thread
{
    MyThread()
    {
        System.out.print(" MyThread");
    }
    public void run()
    {
        System.out.print(" bar");
    }
    public void run(String s)
    {
        System.out.println(" baz");
    }
}
public class TestThreads
{
    public static void main (String [] args)
    {
        Thread t = new MyThread()
        {
            public void run()
            {
                System.out.println(" foo");
            }
        };
        t.start();
    }
}
```

9.6 What will be the output of this program?

```java
public class HowMayTimes implements Runnable {
    int k = 0;
    public HowMayTimes(int i) {
        k = i;
    }
    public static void main(String[] args) {
        new HowMayTimes(2).run();
        new HowMayTimes(1).run();
    }
    public void run() {
        for (int i = 0; i < k; i++)
            System.out.println("Simple Question");
    }
}
```

9.7 What will be the output of the below program?

```java
public class NewQuestion {
    public static void main(String[] args) {
        new VolatileTest("Merit").run();
        new VolatileTest("Campus").run();
    }
}
class VolatileTest extends Thread {
    private volatile int testValue;
    private volatile boolean ready;
    public VolatileTest(String str) {
        super(str);
    }
    public void run() {
        for (int i = 0; i < 2; i++) {
            try {
                if (getName().equals("Merit")) {
                    ready = true;
                    testValue = i;
                    System.out.println(getName() + ", " + ready + ", " + testValue);
                }
                if (getName().equals("Campus")) {
                    System.out.println(getName() + ", " + ready + ", " + testValue);
                }
                Thread.sleep(1000);
            } catch (InterruptedException exception) {
                exception.printStackTrace();
            }
        }
    }
}
```

9.8 What will be the output of this program?

```java
import java.io.*;
    class Chararrayinput
    {
        public static void main(String[] args)
        {
            String obj  = "abcdef";
            int length = obj.length();
            char c[] = new char[length];
            obj.getChars(0, length, c, 0);
            CharArrayReader input1 = new CharArrayReader(c);
            CharArrayReader input2 = new CharArrayReader(c, 0, 3);
            int i;
            try
            {
                while((i = input2.read()) != -1)
                {
                    System.out.print((char)i);
```

```
            }
            }
         catch (IOException e)
         {
            e.printStackTrace();
         }
      }
   }
```

9.9 What will be the output of the following program?
```
class s1 implements Runnable
{
   int x = 0, y = 0;
   int addX() {x++; return x;}
   int addY() {y++; return y;}
   public void run() {
   for(int i = 0; i < 10; i++)
      System.out.println(addX() + " " + addY());
}
   public static void main(String args[])
   {
      s1 run1 = new s1();
      s1 run2 = new s1();
      Thread t1 = new Thread(run1);
      Thread t2 = new Thread(run2);
      t1.start();
      t2.start();
   }
}
```

9.10 What will be the output of the following program?
```
public class Kashmir {
   public static void main(String[] args) {
      try {
         KanyaKumari kk = new KanyaKumari();
         kk.run();
         p('A');
         kk.start();
         kk.join();
         p('H');
         kk.run();
         p('M');
         kk.start();
         p('B');
      } catch (Exception ex) {
         p('I');
      }
      p('R');
   }
   private static void p(char c) {
```

```
            System.out.print(c);
        }
}
class KanyaKumari extends Thread {
        String s = "KSMI";
        static int i = 0;
        public void run() {
            System.out.print(s.charAt(i++));
        }
}
```