REPORT MANUAL OF JOBSHEET PRACTICUM, TASKS AND QUESTIONS (NETWORK PROGRAMMING)

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Practicum 1

Code

```
public class ThreadOne implements Runnable {

    private final String name;

    public ThreadOne(String name) {
        this.name = name;
    }


    @Override
    public void run() {
        for (int i = 0; i < 10; i++) {
            System.out.println(name + ": " + i);
            try {
                Thread.sleep(100);
            } catch (InterruptedException ex) {
                Logger.getLogger(ThreadOne.class.getName()).log(Level.SEVERE, null, ex);
            }
        }
    }

}
```

```
public class ThreadTwo extends Thread {
    @Override
    public void run() {
        for (int i = 0; i < 10; i++) {
            System.out.println(getName() + ": " + i);
            try {
                sleep(100);
            } catch (InterruptedException ex) {
                Logger.getLogger(ThreadTwo.class.getName()).log(Level.SEVERE, null, ex);
            }
        }
    }
}
```

```
public class Praktikum1 {
    public static void main(String[] args) {
        Thread t = new Thread(new ThreadOne("Thread Satu"));
        t.start();
        ThreadTwo t2 = new ThreadTwo();
        t2.setName("Thread Dua");
        t2.start();
    }
}
```

Result

```
Thread Dua: 0
Thread Satu: 0
Thread Satu: 1
Thread Dua: 1
Thread Dua: 2
Thread Satu: 2
Thread Dua: 3
Thread Satu: 3
Thread Dua: 4
Thread Satu: 4
Thread Dua: 5
Thread Satu: 5
Thread Satu: 6
Thread Dua: 6
Thread Satu: 7
Thread Dua: 7
Thread Satu: 8
Thread Dua: 8
Thread Dua: 9
Thread Satu: 9
BUILD SUCCESSFUL (total time: 2 seconds)
```

Question

1. What is the function of the sleep () method?

Answer : For interval / delay at poped up the message

2. State the advantages and disadvantages of creating a thread with the Extends class Thread and implementing the Runnable interface?

Thread

Advantages :

1. Reduce development time
2. Reduce maintenance cost
3. Improve performance

Disadvantages :

1. Multiple threads can interfere with each other when sharing hardware
2. Execution times can be degraded

Implement Runnable

Advantages :

1. we can save a space for our class to extend any othe class
2. it shares same object to multiple thread

Disadvantages :

Practicum 2

Code

```
public class Generator {
    private int low, high;

    public Generator(int low, int high) {
        this.low = low;
        this.high = high;
    }

    public synchronized void generateRandomNumber(String name) {
        Random r = new Random();
        for (int i = 0; i < 10; i++) {
            int result = r.nextInt(high - low) + low;
            System.out.println(name + ": " + result);
            try {
                Thread.sleep(100);
            } catch (InterruptedException ex) {
                Logger.getLogger(Generator.class.getName()).log(Level.SEVERE, null, ex);
            }
        }
    }
}
```

```
    class GeneratorThread implements Runnable{
    private String name;
    private int low, high;

    public GeneratorThread(String name, int low, int high) {
        this.name = name;
        this.low = low;
        this.high = high;
    }

    @Override
    public void run() {
        Generator gen = new Generator(low, high);
        gen.generateRandomNumber(name);
    }
}

class Praktikum2{
    public static void main(String[] args) {
        GeneratorThread th0 = new GeneratorThread("Thread-0", 10, 100);
        GeneratorThread th1 = new GeneratorThread("Thread-1", 10, 100);
        th0.run();
        th1.run();
    }
}
```

Result

```
run single:
Thread-0: 35
Thread-0: 79
Thread-0: 42
Thread-0: 47
Thread-0: 33
Thread-0: 93
Thread-0: 86
Thread-0: 28
Thread-0: 13
Thread-0: 12
Thread-1: 65
Thread-1: 15
Thread-1: 24
Thread-1: 33
Thread-1: 64
Thread-1: 35
Thread-1: 28
Thread-1: 43
Thread-1: 67
Thread-1: 77
BUILD SUCCESSFUL (total time: 3 seconds)
```

Question

1. What are Class Generators used for?
Answer : Class Generators is used to generate the random number

2. Is the keyword function synchronized in the Generator class?
Answer : used to access control process from shared resources from many threads until only one threads that can access the resources in 1 time

Assignment

Code

```
private void Pause() {
    paused = true;
}

public void resume() {
    synchronized (lock) {
        paused = false;
        lock.notifyAll();
    }
}
```

```
public void time() {
    Thread clock = new Thread() {
        public void run() {
            try {
                while (true) {
                    if (paused) {
                        try {
                            synchronized (lock){
                            lock.wait();
                            )SS
                        } catch (InterruptedException e) {
                            // nothing
                        }
                    }
                    {
                        SimpleDateFormat dateFormat = new SimpleDateFormat("E, dd-mm-yyyy");
                        SimpleDateFormat timeFormat = new SimpleDateFormat("hh:mm:ss a");
                        dateLabel.setText(dateFormat.format(new Date()));
                        timeLabel.setText(timeFormat.format(new Date()));
                        sleep(1000);
                    }
                }
            } catch (InterruptedException e) {
                e.printStackTrace();
            }
        }
    };
    clock.start();
}
```

```
private void pausebuttonActionPerformed(java.awt.event.ActionEvent evt) {
    if (pausebutton.getText().contains("Pause")) {
        Pause();
        pausebutton.setText("Resume");
    } else {
        resume();
        pausebutton.setText("Pause");
    }
}
```

Result