НИУ ИТМО
Кафедра ИПМ

Лабораторная работа № 1(2?)
По предмету:
"Операционные системы"
Вариант 3

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Код:

SPNProcessor

```java
public class SPNProcessor {
    private long workTime = 0;
    private int countOfProcesses = 0;
    private boolean isBusy;
    private TreeSet<Process> processes;

    public SPNProcessor() {
        isBusy = false;
        processes = new TreeSet<>();
    }

    public void addProcess(Process process) {
        synchronized (processes) {
            process.setRecivedTime(System.currentTimeMillis());
            processes.add(process);
        }
        if (!isBusy) {
            doWork();
        }
    }

    private void doWork() {
        new Thread(() -> {
            isBusy = true;
            Process currentProcess = null;
            int timeToSleep = 0;
            while (processes.size() > 0) {
                synchronized (processes) {
                    if (processes.size() != 0) {
                        currentProcess = processes.pollFirst();
                        timeToSleep = currentProcess.getLength();
                    }
                }
                try {
                    Thread.sleep(timeToSleep);
                    countOfProcesses++;
                    workTime += System.currentTimeMillis() -
currentProcess.getRecivedTime();
                } catch (InterruptedException e) {
                    e.printStackTrace();
                }
            }
            System.out.println("Mean time for SPNP Processor = " +
(workTime / countOfProcesses));
            isBusy = false;
```

```java
            }).start();
    }
}
```

SRTProcessor
```java
public class SRTProcessor {
    private boolean isBusy;
    private int countOfProcesses = 0;
    private long workTime = 0;
    private TreeSet<Process> processes;

    public SRTProcessor() {
        isBusy = false;
        processes = new TreeSet<>();
    }

    public void addProcess(Process process) {
        synchronized (processes) {
            process.setRecivedTime(System.currentTimeMillis());
            processes.add(process);
        }
        if (!isBusy) {
            doWork();
        }
    }

    private void doWork() {
        new Thread(() -> {
            isBusy = true;
            int timeToSleep;
            Process currentProcess;
            while (processes.size() > 0) {
                synchronized (processes) {
                    currentProcess = processes.pollFirst();
                    timeToSleep = currentProcess.getLength();
                }
                for (int i = 10; i < timeToSleep; i += 10) {
                    try {
                        Thread.sleep(10);
                    } catch (InterruptedException e) {
                        e.printStackTrace();
                    }
                    synchronized (processes) {
                        if (processes.size() != 0) {
                            if (timeToSleep - i >
processes.first().getLength()) {
                                currentProcess.setLength(timeToSleep -
i);
```

```
                            processes.add(currentProcess);
                            break;
                        }
                    } else {
                        if (timeToSleep - i <= 0) {
                            System.out.println("Empty!");
                            break;
                        }
                    }
                }
                if (timeToSleep - i == 10) {
                    workTime += System.currentTimeMillis() -
currentProcess.getRecivedTime();
                    countOfProcesses++;
                }
            }
        }
        isBusy = false;
        System.out.println("Mean time for SRTProcessor is " +
(workTime / countOfProcesses));
    }).start();
    }
}
```

Исходные данные:
В соответствие с вариантом **время выполнения** находится **в диапазоне от 3 до 9**.
Среднее **время между поступающими процессами** находится в диапазоне между **от 1 до 7.**

Результаты:
#1
Mean time for **SRTProcessor** is **1744**
Mean time for **SPNProcessor** is **1176**

#2
Mean time for **SRTProcessor** is **1743**
Mean time for **SPNProcessor** is **1630**

#3
Mean time for **SRTProcessor** is **1635**
Mean time for **SPNProcessor** is **1151**
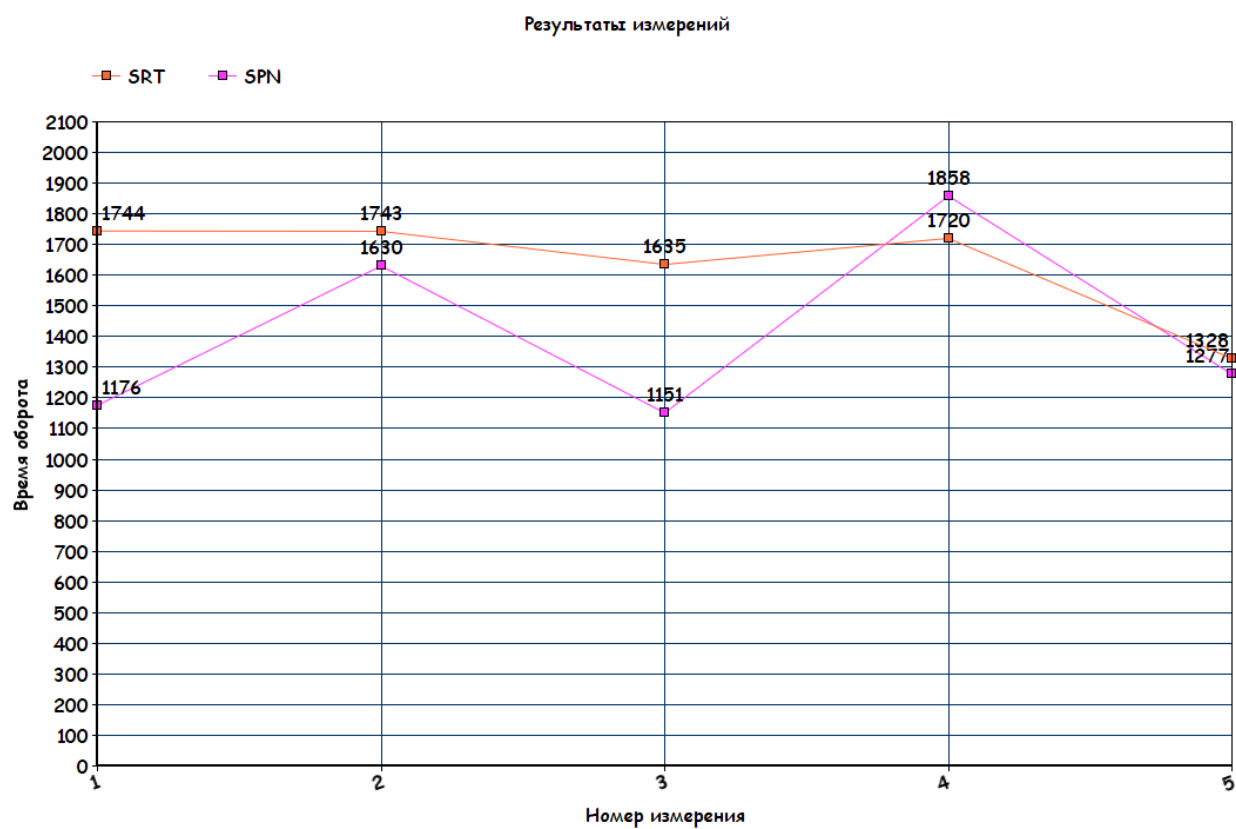
#4
Mean time for **SRTProcessor** is **1720**
Mean time for **SPNProcessor** is **1858**

#5
Mean time for **SRTProcessor** is **1328**
Mean time for **SPNProcessor** is **1277**

Результаты измерений приведены в **милесекундах.**

Результаты измерений

Как видно на графике, в SPN, в большинстве ситуаций, время оборота меньше.