**ECE411 Lab5 Report**

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**4.1 Use True Time**

**1) 2).**

图形用户界面, 文本, 电子邮件

描述已自动生成 图片包含 背景图案

描述已自动生成

文本

描述已自动生成图片包含 徽标

描述已自动生成

文本

描述已自动生成图片包含 文本

描述已自动生成

**3)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Execution time /s | Period /s | Utilization Factor |
| A | 0.01 | 0.014 | 0.7 |
| B | 0.014 | 0.02 | 0.7 |
| C | 0.017 | 0.024 | 0.7 |

**4)**

pendulum A

**图表

描述已自动生成图表

低可信度描述已自动生成**

From figure above execution time is 0.01s, period is 0.014s the schedule is consistent.

**5)**

pendulum B

图表

描述已自动生成图形用户界面

描述已自动生成

From figure above execution time is 0.014s, period is 0.02s the schedule is consistent.

pendulum C

图表

描述已自动生成 图表

中度可信度描述已自动生成

From figure above execution time is 0.017s, period is 0.024s the schedule is consistent.

**4.2 Fixed-Priority Scheduling**

**1)**

**图示, 示意图

描述已自动生成**

Pendulum A Pendulum B

**图表

描述已自动生成图表, 直方图

描述已自动生成**

Pendulum C

**图表, 折线图

描述已自动生成**

Scheduler

**图示

描述已自动生成**

Only Pendulum A stabilize to 1 since pendulum A has the highest priority and from the scheduler, only A finish the execution time in the period.

Both B and C don’t have enough time to execute within the period and thus not stabilized.

**2)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Execution time /s | Period /s | Utilization Factor |
| A | 0.01 | 0.04 | 0.25 |
| B | 0.014 | 0.056 | 0.25 |
| C | 0.017 | 0.068 | 0.25 |

Pendulum A Pendulum B

**图表

描述已自动生成图表

描述已自动生成**

Pendulum C

**图表, 折线图

描述已自动生成**

Scheduler

**屏幕上有字

描述已自动生成**

The result of U=25% is satisfactory compared to U=75% since the 3 pendulum stabilize to 1 although pendulum C has some mild oscillation.

From the scheduler 3 pendulum can execute within the period.

**3)**

|  |  |  |
| --- | --- | --- |
|  | Execution time /s | Period /s |
| A | 0.01 | 0.041 |
| B | 0.014 | 0.041 |
| C | 0.017 | 0.041 |

From the design U = 1

Pendulum C

**图表

描述已自动生成**

Scheduler

**屏幕上有字

描述已自动生成**

**4)**

**Use “PrioDM” priority assignment**

Pendulum A

**图片包含 图表

描述已自动生成**

Scheduler

**文本

描述已自动生成**

When use “PrioDM” priority assignment since pendulum A has the shortest period, it has the highest priority.

From the scheduler, pendulum A can finish execution within the period thus stabilize to 1.

**Reverse priority A = 3 B=2 C=1**

Pendulum A Pendulum B

图表, 折线图, 直方图

描述已自动生成图表

描述已自动生成

Pendulum C

图表

中度可信度描述已自动生成

Scheduler

图形用户界面

描述已自动生成

With reversed priority, pendulum A does not stabilize.

From the scheduler, pendulum A does not always meet its deadline and finish execution within the period.

Thus in fixed-priority scheduling, the system with lower priority has higher chance of missing deadline and fail the control design.

**4.3 Earliest Deadline First Scheduling**

**1)**

|  |  |  |
| --- | --- | --- |
|  | Execution time /s | Period /s |
| A | 0.01 | 0.041 |
| B | 0.014 | 0.041 |
| C | 0.017 | 0.041 |

From the design U = 1

**2) step response**

Pendulum A Pendulum B

**图表

描述已自动生成图表

描述已自动生成**

Pendulum C

**图表

描述已自动生成**

**4.3 Earliest Deadline First Scheduling**

|  |  |  |
| --- | --- | --- |
|  | advantage | disadvantage |
| Fixed priority | * Easy to implement * Can ensure the most important task has the highest priority | * May not achieve highest utilization factor |
| Earlier deadline first | * Flexible * Try to make all tasks meet its deadline * Higher utilization | * Tasks miss their deadline may cause cascading missed deadline for other tasks |