OS project1 report

1. 設計

- 我們使用**clock_gettime**取代**getnstimeofday**，因為可以得到精確度的資訊和一樣準確的效果。
- 我們把要寫入**dmesg**的資料從user space直接寫入"/dev/kmsg"取代呼叫**printk**，因為這樣比較快速安全，避免改到kernel log不必要的地方而造成自己電腦其他問題。
- 使用**sched_setaffinity**來讓使用的CPU都固定在第一顆，這樣能避免一些多Core執行的問題。
- 使用**sched_setscheduler**來調整process的priority，並且設定成FIFO的mode，讓運行中的process不會被搶斷。
- 使用**sched_yield**來把當前process的執行權交給同priority的其他process。
- schedule每隔一段時間會把執行權從process那裡收回來，然後再依照情況分給processes。

2. 執行範例測資的結果

https://github.com/qazwsxedcrfvtg14/OS-Proj1/blob/master/dmesg
https://github.com/qazwsxedcrfvtg14/OS-Proj1/tree/master/OS_PJ1_Test

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FIFO_1
P1 26427
P2 26428
P3 26429
P4 26430
P5 26431

FIFO_2
P1 26436
P2 26437
P3 26438
P4 26439

FIFO_3
P1 26473
P2 26474
P3 26475
P4 26476
P5 26477
P6 26478
P7 26479

FIFO_4
P1 26492
P2 26493
P3 26494
P4 26495

FIFO_5
P1 26500
P2 26501
P3 26502
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P4 26503
P5 26504
P6 26505
P7 26506

RR_1
P1 26557
P2 26558
P3 26559
P4 26560
P5 26561

RR_2
P1 26566
P2 26567

RR_3
P1 26577
P2 26578
P3 26579
P4 26580
P5 26581
P6 26582

RR_4
P1 26591
P2 26598
P3 26599
P4 26601
P5 26602
P6 26603
P7 26604

RR_5
P1 26879
P2 26880
P3 26881
P4 26882
P5 26883
P6 26884
P7 26885

SJF_1
P1 26906
P2 26907
P3 26915
P4 26916

SJF_2
P1 26922
P2 26923
P3 26924
P4 26925
P5 26926
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SJF_3
P1 26933
P2 26934
P3 26935
P4 26936
P5 26937
P6 26938
P7 26939
P8 26940

SJF_4
P1 26948
P2 26949
P3 26950
P4 26951
P5 26952

SJF_5
P1 26957
P2 26958
P3 26959
P4 26960


PSJF_1
P1 26513
P2 26514
P3 26515
P4 26516

PSJF_2
P1 26522
P2 26523
P3 26524
P4 26525
P5 26526

PSJF_3
P1 26531
P2 26532
P3 26533
P4 26534

PSJF_4
P1 26539
P2 26540
P3 26541
P4 26542

PSJF_5
P1 26547
P2 26548
P3 26549
P4 26550
P5 26551
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PSJF_3
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3. 比較實際結果與理論結果，並解釋造成差異的原因

- 每組測資第一個圖表為實際時間，第二個圖表為理論時間

1. FIFO

	A	B	C	D	E
1	Name	PID	Start Time	End Time	Chart
2					
3	FIFO_1				
4	P1		1,556,630,002.40	1,556,630,003.72	
5	P2		1,556,630,003.72	1,556,630,005.06	
6	P3		1,556,630,005.06	1,556,630,006.40	
7	P4		1,556,630,006.40	1,556,630,007.73	
8	P5		1,556,630,007.73	1,556,630,009.05	
9					
10	P1		0.00	500.00	
11	P2		500.00	1,000.00	
12	P3		1,000.00	1,500.00	
13	P4		1,500.00	2,000.00	
14	P5		2,000.00	2,500.00	
15					
16	FIFO_2				
17	P1		1,556,630,009.06	1,556,630,221.87	
18	P2		1,556,630,221.87	1,556,630,235.17	
19	P3		1,556,630,235.17	1,556,630,237.83	
20	P4		1,556,630,237.83	1,556,630,240.49	
21					
22	P1		0.00	80,000.00	
23	P2		80,000.00	85,000.00	
24	P3		85,000.00	86,000.00	
25	P4		86,000.00	87,000.00	
26					
27	FIFO_3				
28	P1		1,556,630,240.50	1,556,630,261.79	
29	P2		1,556,630,261.79	1,556,630,275.09	
30	P3		1,556,630,275.09	1,556,630,283.07	
31	P4		1,556,630,283.07	1,556,630,285.74	
32	P5		1,556,630,285.74	1,556,630,288.40	
33	P6		1,556,630,288.40	1,556,630,291.06	
34	P7		1,556,630,291.06	1,556,630,301.69	
35					
36	P1		0.00	8,000.00	
37	P2		8,000.00	13,000.00	
38	P3		13,000.00	16,000.00	
39	P4		16,000.00	17,000.00	
40	P5		17,000.00	18,000.00	
41	P6		18,000.00	19,000.00	
42	P7		19,000.00	23,000.00	
43					
44	FIFO_4				
45	P1		1,556,630,301.70	1,556,630,307.01	
46	P2		1,556,630,307.01	1,556,630,308.35	
47	P3		1,556,630,308.35	1,556,630,308.87	
48	P4		1,556,630,308.88	1,556,630,310.21	
49					
50	P1		0.00	2,000.00	
51	P2		2,000.00	2,500.00	
52	P3		2,500.00	2,700.00	
53	P4		2,700.00	3,200.00	
54					
55	FIFO_5				
56	P1		1,556,630,310.21	1,556,630,331.49	
57	P2		1,556,630,331.49	1,556,630,344.77	
58	P3		1,556,630,344.77	1,556,630,352.75	
59	P4		1,556,630,352.76	1,556,630,355.42	
60	P5		1,556,630,355.42	1,556,630,358.07	
61	P6		1,556,630,358.07	1,556,630,360.73	
62	P7		1,556,630,360.73	1,556,630,371.36	
63					
64	P1		0.00	8,000.00	
65	P2		8,000.00	13,000.00	
66	P3		13,000.00	16,000.00	
67	P4		16,000.00	17,000.00	
68	P5		17,000.00	18,000.00	
69	P6		18,000.00	19,000.00	
70	P7		19,000.00	23,000.00	

2. RR

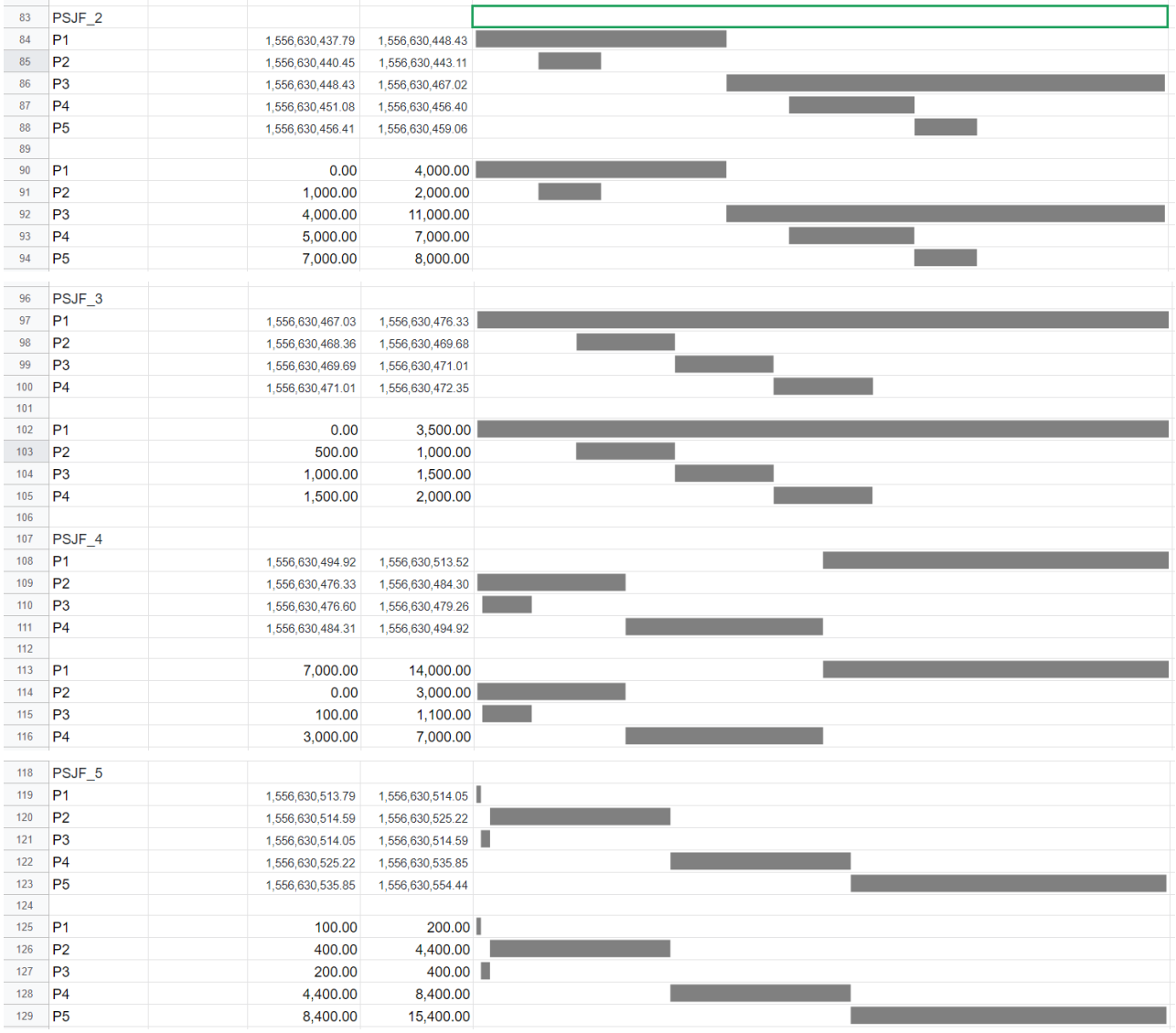
198	RR_1			
199	P1	1,556,630,554.47	1,556,630,555.79	
200	P2	1,556,630,555.79	1,556,630,557.12	
201	P3	1,556,630,557.12	1,556,630,558.46	
202	P4	1,556,630,558.46	1,556,630,559.78	
203	P5	1,556,630,559.78	1,556,630,561.11	
204				
205	P1	0.00	500.00	
206	P2	500.00	1,000.00	
207	P3	1,000.00	1,500.00	
208	P4	1,500.00	2,000.00	
209	P5	2,000.00	2,500.00	
210				
211	RR_2			
212	P1	1,556,630,562.73	1,556,630,582.67	
213	P2	1,556,630,564.06	1,556,630,586.65	
214				
215	P1	600.00	8,100.00	
216	P2	1,100.00	9,600.00	
218	RR_3			
219	P1	1,556,630,589.91	1,556,630,639.12	
220	P2	1,556,630,593.90	1,556,630,640.46	
221	P3	1,556,630,597.88	1,556,630,635.14	
222	P4	1,556,630,603.21	1,556,630,669.69	
223	P5	1,556,630,604.53	1,556,630,667.03	
224	P6	1,556,630,608.52	1,556,630,661.72	
225				
226	P1	1,200.00	20,200.00	
227	P2	2,700.00	20,700.00	
228	P3	4,200.00	18,200.00	
229	P4	6,200.00	31,200.00	
230	P5	6,700.00	30,200.00	
231	P6	7,200.00	28,200.00	
233	RR_4			
234	P1	1,556,630,669.79	1,556,630,730.98	
235	P2	1,556,630,671.12	1,556,630,723.00	
236	P3	1,556,630,672.46	1,556,630,708.37	
237	P4	1,556,630,673.78	1,556,630,684.42	
238	P5	1,556,630,675.11	1,556,630,685.75	
239	P6	1,556,630,676.45	1,556,630,687.09	
240	P7	1,556,630,679.10	1,556,630,719.01	
241				
242	P1	0.00	23,000.00	
243	P2	500.00	20,000.00	
244	P3	1,000.00	14,500.00	
245	P4	1,500.00	5,500.00	
246	P5	2,000.00	6,000.00	
247	P6	2,500.00	6,500.00	
248	P7	3,000.00	18,000.00	
250	RR_5			
251	P1	1,556,630,730.99	1,556,630,792.36	
252	P2	1,556,630,732.34	1,556,630,784.37	
253	P3	1,556,630,733.67	1,556,630,769.69	
254	P4	1,556,630,735.00	1,556,630,745.69	
255	P5	1,556,630,736.34	1,556,630,747.01	
256	P6	1,556,630,739.01	1,556,630,749.68	
257	P7	1,556,630,740.34	1,556,630,780.38	
258				
259	P1	0.00	23,000.00	
260	P2	500.00	20,000.00	
261	P3	1,000.00	14,500.00	
262	P4	1,500.00	5,500.00	
263	P5	2,000.00	6,000.00	
264	P6	2,500.00	6,500.00	
265	P7	3,000.00	18,000.00	

3. SJF

131	SJF_1			
132	P1	1,556,630,811.78	1,556,630,830.39	
133	P2	1,556,630,792.77	1,556,630,798.47	
134	P3	1,556,630,798.47	1,556,630,801.14	
135	P4	1,556,630,801.14	1,556,630,811.78	
136				
137	P1	7,000.00	14,000.00	
138	P2	0.00	2,000.00	
139	P3	2,000.00	3,000.00	
140	P4	3,000.00	7,000.00	
141				
142	SJF_2			
143	P1	1,556,630,830.66	1,556,630,830.93	
144	P2	1,556,630,831.47	1,556,630,842.11	
145	P3	1,556,630,830.93	1,556,630,831.47	
146	P4	1,556,630,842.11	1,556,630,852.74	
147	P5	1,556,630,852.74	1,556,630,871.36	
148				
149	P1	100.00	200.00	
150	P2	400.00	4,400.00	
151	P3	200.00	400.00	
152	P4	4,400.00	8,400.00	
153	P5	8,400.00	15,400.00	
155	SJF_3			
156	P1	1,556,630,871.63	1,556,630,879.60	
157	P2	1,556,630,900.92	1,556,630,914.22	
158	P3	1,556,630,914.22	1,556,630,932.82	
159	P4	1,556,630,879.60	1,556,630,879.63	
160	P5	1,556,630,879.63	1,556,630,879.66	
161	P6	1,556,630,879.66	1,556,630,890.30	
162	P7	1,556,630,890.30	1,556,630,900.92	
163	P8	1,556,630,932.82	1,556,630,956.74	
164				
165	P1	100.00	3,100.00	
166	P2	11,120.00	16,120.00	
167	P3	16,120.00	23,120.00	
168	P4	3,100.00	3,110.00	
169	P5	3,110.00	3,120.00	
170	P6	3,120.00	7,120.00	
171	P7	7,120.00	11,120.00	
172	P8	23,120.00	32,120.00	
174	SJF_4			
175	P1	1,556,630,956.74	1,556,630,964.71	
176	P2	1,556,630,964.71	1,556,630,967.38	
177	P3	1,556,630,967.38	1,556,630,978.00	
178	P4	1,556,630,980.66	1,556,630,985.97	
179	P5	1,556,630,978.00	1,556,630,980.66	
180				
181	P1	0.00	3,000.00	
182	P2	3,000.00	4,000.00	
183	P3	4,000.00	8,000.00	
184	P4	9,000.00	11,000.00	
185	P5	8,000.00	9,000.00	
187	SJF_5			
188	P1	1,556,630,985.99	1,556,630,991.31	
189	P2	1,556,630,991.31	1,556,630,992.63	
190	P3	1,556,630,992.63	1,556,630,993.96	
191	P4	1,556,630,993.96	1,556,630,995.29	
192				
193	P1	0.00	2,000.00	
194	P2	2,000.00	2,500.00	
195	P3	2,500.00	3,000.00	
196	P4	3,000.00	3,500.00	

4. PSJF

72	PSJF_1			
73	P1	1,556,630,371.37	1,556,630,437.79	
74	P2	1,556,630,374.02	1,556,630,413.88	
75	P3	1,556,630,376.68	1,556,630,397.94	
76	P4	1,556,630,379.34	1,556,630,387.32	
77				
78	P1	0.00	25,000.00	
79	P2	1,000.00	16,000.00	
80	P3	2,000.00	10,000.00	
81	P4	3,000.00	6,000.00	



83	PSJF_2			
84	P1	1,556,630,437.79	1,556,630,448.43	
85	P2	1,556,630,440.45	1,556,630,443.11	
86	P3	1,556,630,448.43	1,556,630,467.02	
87	P4	1,556,630,451.08	1,556,630,456.40	
88	P5	1,556,630,456.41	1,556,630,459.06	
89				
90	P1	0.00	4,000.00	
91	P2	1,000.00	2,000.00	
92	P3	4,000.00	11,000.00	
93	P4	5,000.00	7,000.00	
94	P5	7,000.00	8,000.00	
96	PSJF_3			
97	P1	1,556,630,467.03	1,556,630,476.33	
98	P2	1,556,630,468.36	1,556,630,469.68	
99	P3	1,556,630,469.69	1,556,630,471.01	
100	P4	1,556,630,471.01	1,556,630,472.35	
101				
102	P1	0.00	3,500.00	
103	P2	500.00	1,000.00	
104	P3	1,000.00	1,500.00	
105	P4	1,500.00	2,000.00	
106				
107	PSJF_4			
108	P1	1,556,630,494.92	1,556,630,513.52	
109	P2	1,556,630,476.33	1,556,630,484.30	
110	P3	1,556,630,476.60	1,556,630,479.26	
111	P4	1,556,630,484.31	1,556,630,494.92	
112				
113	P1	7,000.00	14,000.00	
114	P2	0.00	3,000.00	
115	P3	100.00	1,100.00	
116	P4	3,000.00	7,000.00	
118	PSJF_5			
119	P1	1,556,630,513.79	1,556,630,514.05	
120	P2	1,556,630,514.59	1,556,630,525.22	
121	P3	1,556,630,514.05	1,556,630,514.59	
122	P4	1,556,630,525.22	1,556,630,535.85	
123	P5	1,556,630,535.85	1,556,630,554.44	
124				
125	P1	100.00	200.00	
126	P2	400.00	4,400.00	
127	P3	200.00	400.00	
128	P4	4,400.00	8,400.00	
129	P5	8,400.00	15,400.00	

- 我們使用了關掉了turbo boost的伺服器來跑我們的程式以減少誤差
- 在程式中使用迴圈來等待執行時間會有迴圈本身每次執行時間不固定的問題
- 因為實驗數據和理論數據太過接近，如果要確認真實性可以檢查我們的數據表格：

> https://docs.google.com/spreadsheets/d/10juCjTlHYU_fRDRzz_UOGjr-l86Pfyujyi1fBLcOJeY/edit

4. 各組員的貢獻

B05902086 周　逸：全部的程式部分 B05902052 劉家維：計算理論值、繪製分析圖 B06501051 陳政瑞：寫report、繪製分析圖、協助debug