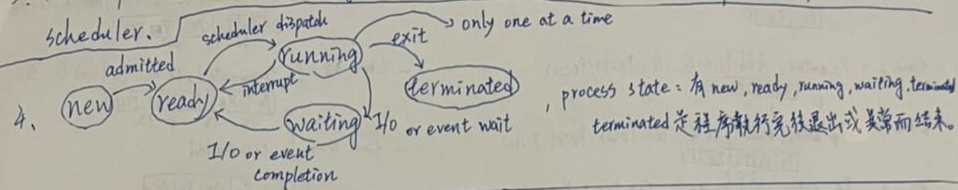


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此次考試為本人「曾柏龍」獨力完成，無上網查詢資料，也絕無透過任何方式或工具與任何親人、朋友或同學討論。

3. The dispatcher is the mode that gives control of the CPU's core to the process by the CPU scheduler.



2.

(a) 裡面有 process state, program counter, CPU register, CPU scheduling Information 等功能，主要是為了管理所有的程序 (process)。

(b) 在進行下一個 process 前對正在執行的 process 做儲存跟載入下一個 process 的動作。

(c) 進行 context switch 等工作的時間損失。

1.

(a)

- time 0: PA(16) enter Q: \square

o PA(16)

- time 1: PB(8) enter, Add PB to Q Q: \overline{PB}

o PA: PA(16)

- time 2: PC(10) enter, Add PC to Q Q: $\overline{PB} \overline{PC}$

o PA: PA(16)

- time 4: PD(2) enter, Add PD to Q Q: $\overline{PB} \overline{PC} \overline{PD}$

o PA: PA(16)

- time 5: PE(6) enter, Add PE to Q Q: $\overline{PB} \overline{PC} \overline{PD} \overline{PE}$

o PA: PA(16)

- time 16: PA terminated, select PB from Q Q: $\overline{PB} \overline{PC} \overline{PD} \overline{PE}$

o PA: PA(16)

- time 24: PB terminated, select PC from Q Q: $\overline{PC} \overline{PD} \overline{PE}$

o PA: PA(16)

- time 34: PC terminated, select PD from Q Q: $\overline{PD} \overline{PE}$

o PA: PA(16)

- time 36: PD terminated, select PE from Q Q: \overline{PE}

o PA: PA(16)

- time 42: PE terminated Q: \square

o PA: PA(16)

Process	PA	PB	PC	PD	PE	Avg
N.T	0	15	14	30	31	$\frac{90}{5} = 18$
T.T	16	23	32	32	37	$\frac{100}{5} = 20$

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1.

(b)

- time 0: PA enter Q: \square
 \square PA(16)

- time 1: PB enter, Add PB to Q Q: PB(8)
 \square PA(16) PB(8)

- time 2: PC enter, Add PC to Q Q: PB(8), PC(10)
 \square PA(16) PB(8) PC(10)

- time 4: PD enter, Add PD to Q Q: PD(5), PB(8), PC(10)
 \square PA(16) PB(8) PC(10) PD(5)

- time 5: PE enter, Add PE to Q Q: PD(5), PE(5), PB(8), PC(10)
 \square PA(16) PD(5) PE(5) PB(8) PC(10)

- time 16: PA terminated, select PD from Q Q: PE, PB, PC
 \square PA(16) PD(5)

Process	PA	PB	PC	PD	PE	Avg
W.T	0	15	30	12	13	$\frac{90}{5}=18$
T.T	16	31	40	14	19	$\frac{160}{5}=32$

- time 18: PD terminated, select PE from Q Q: PB, PC
 \square PA(16) PD(5) PE(5)

- time 24: PE terminated, select PB from Q Q: PC
 \square PA(16) PD(5) PE(5) PB(8)

- time 32: PB terminated, select PC from Q Q:
 \square PA(16) PD(5) PE(5) PB(8) PC(10)

- time 42: PC terminated
 \square PA(16) PD(5) PE(5) PB(8) PC(10)

1.

(c)

- time 0: PA enter Q: \square
 \square PA(16)

- time 1: PB enter, PB(8) < PA(16), Q: PA
 \square PA(16) PB(8)

- time 2: PC enter, PC(10) > PB(8), Q: PC, PA
 \square PA(16) PB(8) PC(10)

- time 4: PD enter, PD(5) < PB(8), Q: PB, PC, PA
 \square PA(16) PB(8) PC(10) PD(5)

- time 5: PE enter, PE(6) > PD(5), Q: PB, PE, PC, PA
 \square PA(16) PB(8) PC(10) PD(5) PE(6)

- time 6: PD terminated, select PB from Q Q: PE, PC, PA
 \square PA(16) PB(8) PC(10) PE(6)

- time 11: PB terminated, select PE from Q Q: PC, PA
 \square PA(16) PB(8) PC(10) PE(6)

- time 17: PE terminated, select PC from Q Q: PA
 \square PA(16) PB(8) PC(10) PE(6)

- time 27: PC terminated, select PA from Q Q:
 \square PA(16) PB(8) PC(10) PE(6)

- time 42: PA terminated
 \square PA(16) PB(8) PC(10) PE(6)

Process	PA	PB	PC	PD	PE	Avg
W.T	0	2	15	0	6	$\frac{49}{5}$
T.T	42	10	25	2	12	$\frac{91}{5}$

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1.

(d)

- time 0: PA enter, set timer = 4

0 PA(4)

- time 1: PB enter, Add PB to Q Q = PB(8)

0 PA(4) PB(8)

- time 2: PC enter, Add PC to Q Q = PB(8), PC(10)

0 PA(4) PB(8) PC(10)

- time 3: time out, Add PA to Q, select PB from Q Q = PC(10), PA(3)

0 PA(3) PB(8)

- time 4: PD enter, Add PD to Q Q = PC(10), PA(3), PD(7)

0 PA(3) PB(8) PD(7)

- time 5: PE enter, Add PE to Q Q = PC(10), PA(3), PD(7), PE(6)

0 PA(3) PB(8) PD(7) PE(6)

- time 6: time out, Add PB to Q, select PC from Q Q = PA(3), PC(10), PE(6), PD(7)

0 PA(3) PB(8) PC(10)

- time 9: time out, Add PC to Q, select PA from Q Q = PD(7), PE(6), PB(5), PC(9)

0 PA(3) PB(8) PC(9)

- time 12: time out, Add PA to Q, select PB from Q Q = PE(6), PB(5), PC(9), PA(10)

0 PA(3) PB(8) PC(9) PA(10)

- time 14: time out, PC terminated, select PE from Q Q = PB(5), PC(9), PA(10)

0 PA(3) PB(8) PC(9) PA(10) PE(6)

- time 17: PD terminated, select PB from Q Q = PA(10), PC(9), PE(6), PD(7)

0 PA(3) PB(8) PC(9) PA(10) PE(6) PD(7)

- time 20: PE terminated, select PA from Q Q = PB(5), PC(9), PE(6), PD(7), PA(10)

0 PA(3) PB(8) PC(9) PA(10) PE(6) PD(7)

- time 23: PB terminated, select PC from Q Q = PB(2), PC(4), PA(7)

0 PA(3) PB(8) PC(4) PA(7) PE(6) PD(7)

- time 29: PD terminated, select PE from Q Q = PA(7), PC(4), PB(2), PE(6)

0 PA(3) PB(8) PC(4) PA(7) PE(6) PD(7)

- time 31: PA terminated, select PB from Q Q = PA(7), PC(4), PB(2), PE(6), PD(7)

0 PA(3) PB(8) PC(4) PA(7) PE(6) PD(7)

- time 34: PB terminated, select PC from Q Q = PA(7), PC(4), PB(2), PE(6), PD(7), PA(10)

0 PA(3) PB(8) PC(4) PA(7) PE(6) PD(7) PA(10)

- time 37: PC terminated, select PE from Q Q = PA(7), PC(4), PB(2), PE(6), PD(7), PA(10), PC(9)

0 PA(3) PB(8) PC(4) PA(7) PE(6) PD(7) PA(10) PC(9)

- time 40: PE terminated, select PA from Q Q = PA(7), PC(4), PB(2), PE(6), PD(7), PA(10), PC(9), PA(10)

0 PA(3) PB(8) PC(4) PA(7) PE(6) PD(7) PA(10) PC(9) PA(10)

, select PE from Q

, select PB from Q

, select PC from Q

, select PD from Q

, select PE from Q

, select PB from Q

, select PC from Q

, select PD from Q

, select PE from Q

, select PB from Q

, select PC from Q

, select PD from Q

, select PE from Q

- time 38: PC(10), PA(10)

- time 41: PC(10)

- time 42: PC(10)

0 PA(3) PB(8) PC(9) PA(10) PE(6) PD(7) PA(10) PC(9) PA(10)

0 PA(3) PB(8) PC(9) PA(10) PE(6) PD(7) PA(10) PC(9) PA(10)

0 PA(3) PB(8) PC(9) PA(10) PE(6) PD(7) PA(10) PC(9) PA(10)

0 PA(3) PB(8) PC(9) PA(10) PE(6) PD(7) PA(10) PC(9) PA(10)

0 PA(3) PB(8) PC(9) PA(10) PE(6) PD(7) PA(10) PC(9) PA(10)

0 PA(3) PB(8) PC(9) PA(10) PE(6) PD(7) PA(10) PC(9) PA(10)

0 PA(3) PB(8) PC(9) PA(10) PE(6) PD(7) PA(10) PC(9) PA(10)

0 PA(3) PB(8) PC(9) PA(10) PE(6) PD(7) PA(10) PC(9) PA(10)

0 PA(3) PB(8) PC(9) PA(10) PE(6) PD(7) PA(10) PC(9) PA(10)

0 PA(3) PB(8) PC(9) PA(10) PE(6) PD(7) PA(10) PC(9) PA(10)

0 PA(3) PB(8) PC(9) PA(10) PE(6) PD(7) PA(10) PC(9) PA(10)

0 PA(3) PB(8) PC(9) PA(10) PE(6) PD(7) PA(10) PC(9) PA(10)

0 PA(3) PB(8) PC(9) PA(10) PE(6) PD(7) PA(10) PC(9) PA(10)

0 PA(3) PB(8) PC(9) PA(10) PE(6) PD(7) PA(10) PC(9) PA(10)

0 PA(3) PB(8) PC(9) PA(10) PE(6) PD(7) PA(10) PC(9) PA(10)

0 PA(3) PB(8) PC(9) PA(10) PE(6) PD(7) PA(10) PC(9) PA(10)

0 PA(3) PB(8) PC(9) PA(10) PE(6) PD(7) PA(10) PC(9) PA(10)

0 PA(3) PB(8) PC(9) PA(10) PE(6) PD(7) PA(10) PC(9) PA(10)

0 PA(3) PB(8) PC(9) PA(10) PE(6) PD(7) PA(10) PC(9) PA(10)

0 PA(3) PB(8) PC(9) PA(10) PE(6) PD(7) PA(10) PC(9) PA(10)

0 PA(3) PB(8) PC(9) PA(10) PE(6) PD(7) PA(10) PC(9) PA(10)

0 PA(3) PB(8) PC(9) PA(10) PE(6) PD(7) PA(10) PC(9) PA(10)

