作業 4

學號：407510046 姓名：黃 X 雯

1.完成 1,2,3 項要求

結果：

```
s407510046@workstation1:~/osdi/sharedFolder/hw05.pthread$ make
gcc -g -lm -pthread pi.c -o pi -lm
s407510046@workstation1:~/osdi/sharedFolder/hw05.pthread$ ./pi -p 10
pi = 3.1421327591
s407510046@workstation1:~/osdi/sharedFolder/hw05.pthread$ ./pi -p 10 -P 5
pi = 3.1478583813
s407510046@workstation1:~/osdi/sharedFolder/hw05.pthread$ ./pi
pi = 3.1421325207
pi = 3.1421322823
pi = 3.1421327591
pi = 3.1421327591
pi = 3.1421327591
pi = 3.1421329975
pi = 3.1421332359
pi = 3.1421327591
pi = 3.1421327591
pi = 3.1421329975
pi = 3.1421329975
pi = 3.1421327591
pi = 3.1421329975
pi = 3.1421329975
pi = 3.1421329975
pi = 3.1421327591
pi = 3.1421329975
pi = 3.1421332359
pi = 3.1421325207
pi = 3.1421327591
```

```
pi = 3.1421329975
pi = 3.1421327591
pi = 3.1421329975
pi = 3.1421329975
pi = 3.1421332359
pi = 3.1421327591
pi = 3.1421327591
pi = 3.1421329975
pi = 3.1421329975
pi = 3.1421327591
pi = 3.1421327591
pi = 3.1421327591
pi = 3.1421327591
pi = 3.1421329975
pi = 3.1421329975
pi = 3.1421327591
pi = 3.1421325207
pi = 3.1421332359
pi = 3.1421329975
pi = 3.1421327591
pi = 3.1421327591
pi = 3.1421327591
pi = 3.1421327591
pi = 3.1421332359
pi = 3.1421329975
pi = 3.1421329975
pi = 3.1421329975
pi = 3.1421329975
^C
```

2.time 函數中的：

real：整個程式執行的時間，就像開始後我們開始計時，直到程式結束。

user：這個程式在 user mode 中所花費的時間。

sys：這個程式在 kernel mode 中所花費的時間。

```
s407510046@workstation1:~/osdi/sharedFolder/hw05.pthread$ time ./pi -p 10
pi = 3.1421329975

real    0m0.011s
user    0m0.186s
sys     0m0.011s
s407510046@workstation1:~/osdi/sharedFolder/hw05.pthread$ time ./pi -p 10 -P 5
pi = 3.1478581429

real    0m0.025s
user    0m0.110s
sys     0m0.008s
```

```
real    0m1.741s
user    0m31.171s
sys     0m1.767s
```

理論上 real > sys + user，但是當開啟多核心處理就不一定。