Introduction to Programming Laboratory
Lab3 - pthread

2017/7/6

Outline

◆ Compile and execute pthread program on the platform

◆ Mutex

◆ Condition variable

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Lab3-1 Compile and run Pthread program

Login to server and copy lab3 directory to your home directory
- cp -r /home/ipl2017/shared/lab3 . && cd lab3

[Compile]

```
gcc HelloWorld_pthread.c -o HelloWorld_pthread -lpthread
```

[Edit job script]

```
#PBS -l nodes=1:ppn=1
```
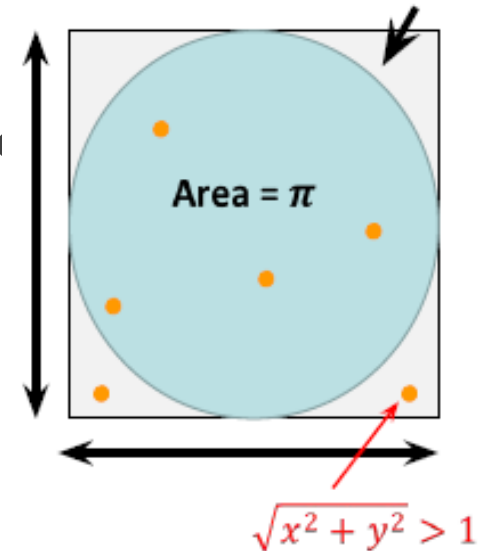
[Run]

```
qsub job.sh
```

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◆ Compile and execute pthread program on the platform

◆ **Mutex**

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Lab3-2 Calculate the value of π using Pthread

Monte Carlo Methods : A class of computational algorithms that rely on repeated random sampling to compute their results.

◦ How to use it to compute **π** ?

  ◦ We know: $\frac{Area\ of\ circle}{Area\ of\ square} = \frac{\pi}{4}$

  ◦ Randomly choose points from the square

  ◦ Giving sufficient number of samples, the fraction the circle will be $\frac{\pi}{4}$

  ◦ $\pi = 4 * \frac{number\ of\ points\ in\ circle}{number\ of\ points\ in\ square}$

Area = π

$\sqrt{x^2 + y^2} > 1$

Lab3-2 Calculate the value of π using Pthread

Pthread version

```
[Compile]
gcc pi_pthread.c -o pi_pthread -lpthread
[Edit job script] vim job.sh:
#PBS -q debug
#PBS -l nodes=1:ppn=1
./pi 500000
[Run]
qsub job.sh
```

Outline

◆ Compile and execute pthread program on the platform

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Lab3-3 Condition variable

Compile and execute pthread_cond.c under lab3 directory, you should see result like below:

```
Threads have been created
Enter 4 values
Values filled in array are
0
0
0
0
```

Modify the program with **condition variable** so that it will wait until you finished entering 4 values, then print the values filled in array !