

1 CS5600 Week06.a

2  
3 1. Some concurrent programs. What is the point of these?

4  
5 [From S.V. Adve and K. Gharachorloo, IEEE Computer, December 1996,  
6 66-76. <http://sadve.cs.illinois.edu/Publications/computer96.pdf>]

7  
8 a. Can both "critical sections" run?

9  
10 int flag1 = 0, flag2 = 0;

11  
12 int main () {  
13 tid id = thread\_create (p1, NULL);  
14 p2 (); thread\_join (id);  
15 }

16  
17 void p1 (void \*ignored) {  
18 flag1 = 1;  
19 if (!flag2) {  
20 critical\_section\_1 ();  
21 }  
22 }

23  
24 void p2 (void \*ignored) {  
25 flag2 = 1;  
26 if (!flag1) {  
27 critical\_section\_2 ();  
28 }  
29 }

30  
31 b. Can use() be called with value 0, if p2 and p1 run concurrently?

32  
33 int data = 0, ready = 0;

34  
35 void p1 () {  
36 data = 2000;  
37 ready = 1;  
38 }  
39 int p2 () {  
40 while (!ready) {}  
41 use(data);  
42 }

43  
44 c. Can use() be called with value 0?

45  
46 int a = 0, b = 0;

47  
48 void p1 (void \*ignored) { a = 1; }

49  
50 void p2 (void \*ignored) {  
51 if (a == 1)  
52 b = 1;  
53 }

54  
55 void p3 (void \*ignored) {  
56 if (b == 1)  
57 use (a);  
58 }  
59  
60

61 2. Protecting the linked list...

62  
63 Mutex list\_mutex;

64  
65 insert(int data) {  
66 List\_elem\* l = new List\_elem;  
67 l->data = data;

68  
69 acquire(&list\_mutex);

70  
71 l->next = head;  
72 head = l;

73  
74 release(&list\_mutex);

75  
76  
77 }