

OS LAB-5

Q) Write a C program to simulate Real-Time CPU Scheduling algorithms: a) Earliest deadline first b) producer-consumer problem using semaphores.

CODE-

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QPM-6

1. Write a C program to simulate Real time Scheduling algorithm

1) Rate monotonic
ii) Earliest deadline first
iii) Proportional scheduling

```
#include <stdio.h>
#include <stdlib.h>

int t[10], n, i, d[10], p[10], re[10], flag = 1;

int main()
{
    int ch = 1;
    while (ch)
    {
        printf("\n Non-real time Earliest deadline first\n Proportional scheduling. End\n");
        printf("\n Enter your choice: ");
        scanf("%d", &ch);
        printf("\n Enter no of processes: ");
        scanf("%d", &n);
        printf("\n Enter execution & deadline:");
        for (int i = 0; i < n; i++)
        {
            scanf("%d %d", &t[i], &d[i]);
            scanf("%d %d", &p[i], &re[i]);
        }
    }
}
```

for (i = 0; i < n; i++)

2 p[i] = b[i]
res[i] = 0;

3

switch (ch)

5

case 1: mono();
break;

case 2: edge();
break;

case 3: prop();
break;

case 4: end();
break;

default: printf("Invalid choice");

6

int len (int a, int b)

8

int mex = (a > b) ? a : b;

while (1)

9

if (mex - 1 == 0 & mex - 1 == 0)
return mex;

10

11

int len (int a, int b)

12 int res = 0;

for (int i = 0; i < n; i++)

res = len (res, a[i]);

return result;

}

void self() {

int len = len(d, n);

int op = 0, pr = 0, pre = 1, flag = 1;

while (op < len) {

for (u = 0; u < n; u++) {
if (op + 1 < d[u]) {

read(u) = 1;

}

flag = 0;

for (u = 0; u < n; u++)

{ if (read(u) == 1) {

flag = 1;

break;

}

if (flag == 0) {

pr = -1;

} else

{

pr = -1;

for (u = 0; u < n; u++)

{

if (read(u) == 1)

{

if (pr == -1 || pr > d[u])

{

pr = u;

}

}

}

if (pr == 0)

{

if (pr == -1)

{
printf("Idle %d", 1 - pr);

}

else

{

printf("Idle %d %d %d %d %d", pr, pr, pr, pr, pr);

}

pr++;

if (pr == -1)

{

pr[pr] = pr[pr] - 1;

if (pr[pr] == 0) {

pr[pr] = pr[pr];

re[pr] = 0;

}

pr = pr;

}

printf("%d", pr);

}

Output

Enter choice: 1

Enter number of processes: 3

Enter execution & deadline time: 3 2 2 5 2 10

Enter choice: 2

Rate: Non-preemptive

0 pr 2 pr 3 pr 5 pr 7 pr 9 idle 10
pr 12 pr 14 idle 15 pr 17 idle 20. 22

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D. Write a C program to simulate
producer-consumer problem using semaphores

Code

```
#include <stdio.h>
#include <stdlib.h>

int mutex = 1, full = 0, empty = 3, x = 0;

int main()
{
    int n;
    void producer();
    void consumer();
    void wait(int);
    void signal(int);
    printf("In 1. Producer In 2. Consumer In 3. Exit");
    scanf("%d", &n);
    switch(n)
    {
        case 1: if (mutex == 1 && (empty != 0))
                producer();
            else
                printf("Buffer is full");
                break;
    }
```

case 2: if (mutex == 1) && (full! == 0).

consumer();

else

printf("Buffer is empty");

break;

case 3: exit(0);

break;

}

return 0;

}

int main (int s)

{
 return (--s);

}

 return signal (end s);

{

 return (++s);

}

 return producer();

{

 mutex = wait (mutex);

 full = signal (full);

 empty = wait (empty);

 x++;

 printf("Producer produces the item %d, x);

 mutex = signal (mutex);

}

void consumer?

{

mutex = signal(mutex);

}

void consumer?

{

mutex = wait(mutex);

full = wait(full);

empty = signal(empty);

printf("Consumer consumes item %d", i);

i--;

mutex = signal(mutex);

}

Output

1. Produce
2. Consume
3. Exit

Enter your choice: 2

Buffer is Empty

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Enter your choice: 1

Producer produces item 1:

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Enter your choice: 2

Consumer consumes item 1

OUTPUT-

Earliest Deadline First

```
Enter your choice:
1. Monotonic
2. EDF
3. Exit
2
Enter the number of processes: 3
Enter execution times:
3 2 2
Enter deadlines:
20 5 10
0 P2 2 P3 4 P1 7 P2 9 Idle 10 P2 12 P3 14 Idle 15 P2 17 Idle 20 P2
```

Producer-Consumer Problem

```
1.Producer
2.Consumer
3.Exit
Enter your choice:2
Buffer is empty!!
Enter your choice:1

Producer produces the item 1
Enter your choice:1

Producer produces the item 2
Enter your choice:2

Consumer consumes item 2
Enter your choice:2

Consumer consumes item 1
Enter your choice:3

Process returned 0 (0x0)   execution time : 11.602 s
Press any key to continue.
```


