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Vellore Institute of Technology

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Parallel and Distributed Computing
CSE4001

Lab Assignment 4

Slot : L21+L22

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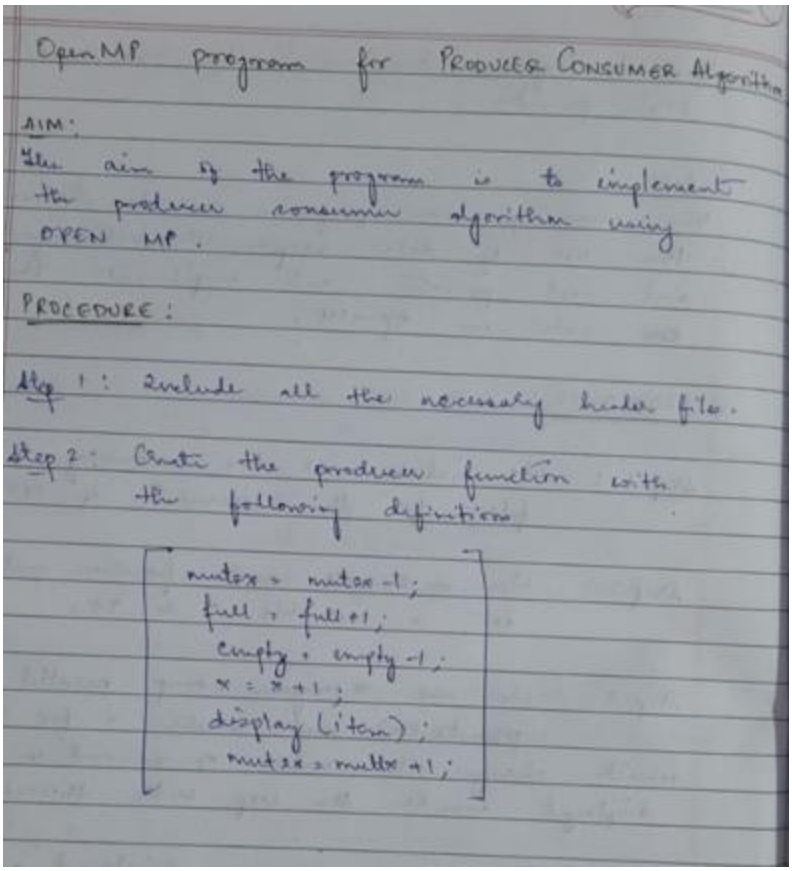
Question 1 : Implement the PRODUCER CONSUMER algorithm using OPENMP

AIM and PROCEDURE :



Open MP program for Producer Consumer Algorithm

AIM:

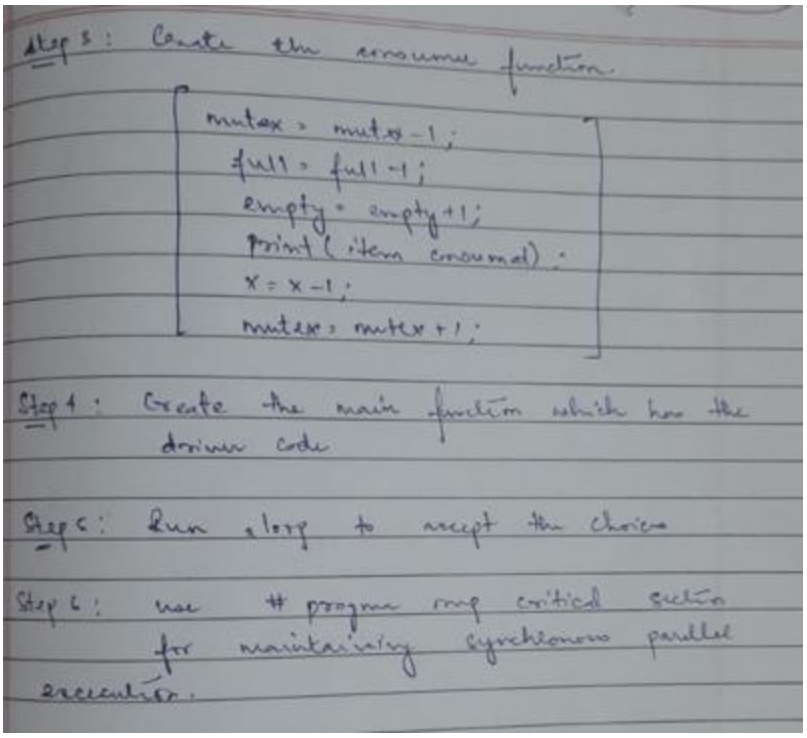
The aim of the program is to implement the producer consumer algorithm using OPEN MP.

PROCEDURE:

Step 1: Include all the necessary header file.

Step 2: Create the producer function with the following definition

```
mutex = mutex-1;
full = full+1;
empty = empty-1;
x = x+1;
display (item);
mutex = mutex+1;
```



Code Screenshot - >

```c
#include <stdio.h>
#include <stdlib.h>
#include <omp.h>
int mutex = 1;
int full = 0;
int empty = 10, x = 0;
void producer()
{
    --mutex;
    ++full;
    --empty;
    x++;
    printf("\nProducer produces""item %d",x);
    ++mutex;
}
void consumer()
{

    --mutex;
    --full;
    ++empty;
    printf("\nConsumer consumes ""item %d",x);
    x--;
    ++mutex;
}
int main()
{
    int n, i;
    printf("\n1. Press 1 for Producer""\n2. Press 2 for Consumer""\n3. Press 3 for Exit");
#pragma omp critical
    for (i = 1; i > 0; i++)
    {
        printf("\nEnter your choice:");
        scanf("%d", &n);
        switch (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;
        }
    }
}
```

Output Screenshot - >

```
kulvir06@ubuntu:~/Desktop/PDC$ touch prodcon.c
kulvir06@ubuntu:~/Desktop/PDC$ gcc prodcon.c -o prodcon -fopenmp
kulvir06@ubuntu:~/Desktop/PDC$ ./prodcon

1. Press 1 for Producer
2. Press 2 for Consumer
3. Press 3 for Exit
Enter your choice:1

Producer producesitem 1
Enter your choice:1

Producer producesitem 2
Enter your choice:1

Producer producesitem 3
Enter your choice:1

Producer producesitem 4
Enter your choice:2

Consumer consumes item 4
Enter your choice:2

Consumer consumes item 3
Enter your choice:2

Consumer consumes item 2
Enter your choice:2

Consumer consumes item 1
Enter your choice:2
Buffer is empty!
Enter your choice:2
Buffer is empty!
Enter your choice:1

Producer producesitem 1
Enter your choice:1

Producer producesitem 2
Enter your choice:1

Producer producesitem 3
Enter your choice:1
```

```
Enter your choice:1

Producer producesitem 9
Enter your choice:1

Producer producesitem 10
Enter your choice:1
Buffer is full!
Enter your choice:1
Buffer is full!
Enter your choice:1
Buffer is full!
Enter your choice:1
Buffer is full!
Enter your choice:2

Consumer consumes item 10
Enter your choice:2

Consumer consumes item 9
Enter your choice:2

Consumer consumes item 8
Enter your choice:2

Consumer consumes item 7
Enter your choice:2

Consumer consumes item 6
Enter your choice:2

Consumer consumes item 5
Enter your choice:2

Consumer consumes item 4
Enter your choice:2

Consumer consumes item 3
Enter your choice:2

Consumer consumes item 2
Enter your choice:2

Consumer consumes item 1
Enter your choice:2
Buffer is empty!
```