

## DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING (ARTIFICIAL INTELLIGENCE & MACHINE LEARNING)

Academic Year: 2024-25

Semester: IV

Class / Branch: SE AIML

Subject: CSL403 Operating System Lab

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Date of Performance:28.02.25

Date of Submission:28.02.25

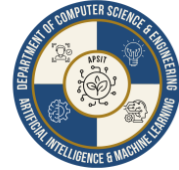
### Experiment No.5

**Aim:** Write a C program to implement solution of Producer Consumer problem through semaphore.

#### Program:

```
Activities Text Editor
Fri 14:28
*exp5.c
~/Desktop/81
Save

1 #include <stdio.h>
2 #include <stdlib.h>
3
4 int mutex = 1;
5 int full = 0;
6 int empty = 10, data = 0;
7 void producer()
8 {
9     --mutex;
10    ++full;
11    --empty;
12    data++;
13    printf("\nProducer produces item number: %d\n", data);
14    ++mutex;
15 }
16
17 void consumer()
18 {
19     --mutex;
20     --full;
21     ++empty;
22     printf("\nConsumer consumes item number: %d.\n", data);
23     data--;
24     ++mutex;
25 }
26 int main()
27 {
28     int n, i;
29     printf("\n1. Enter 1 for Producer"
30     "\n2. Enter 2 for Consumer"
31     "\n3. Enter 3 to Exit");
32     for (i = 1; i > 0; i++)
33     {
34         printf("\nEnter your choice: ");
35         scanf("%d", &n);
36
37         switch (n)
38         {
39             case 1:
40                 if ((mutex == 1) && (empty != 0))
41                 {
42                     producer();
43                 }
44             else
45             {
46                 continue;
47             }
48         }
49     }
50 }
```



```
45 else
46 {
47 printf("The Buffer is full. New data cannot be produced!");
48 }
49 break;
50 case 2:
51 if ((mutex == 1) && (full != 0))
52 {
53 consumer();
54 }
55 }
56 else
57 {
58 printf("The Buffer is empty! New data cannot be consumed!");
59 }
60 break;
61 case 3:
62 exit(0);
63 break;
64 }
65 }
66 }
67 }
```

## Output:

```
Fri 14:33
*exp5.c
~/Desktop/81
Save

a)
apsit@apsit-HP-280-G3-MT: ~/Desktop/81
File Edit View Search Terminal Help
bash: cd: 81: No such file or directory
apsit@apsit-HP-280-G3-MT:~$ cd Dsktop
bash: cd: Dsktop: No such file or directory
apsit@apsit-HP-280-G3-MT:~$ cd Desktop
apsit@apsit-HP-280-G3-MT:~/Desktop$ cd 81
apsit@apsit-HP-280-G3-MT:~/Desktop/81$ touch exp5.c
apsit@apsit-HP-280-G3-MT:~/Desktop/81$ gcc exp5.c
apsit@apsit-HP-280-G3-MT:~/Desktop/81$ ./a.out

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

Producer produces item number: 1

Enter your choice: 2

Consumer consumes item number: 1.

Enter your choice: 2
The Buffer is empty! New data cannot be consumed!
Enter your choice: 3
apsit@apsit-HP-280-G3-MT:~/Desktop/81$
```

## Conclusion:

Hence, we have studied the implementation of producer & consumer problem using semaphore.