

## Os practical 2

```
#include <iostream>
#include <cstdlib>

// Global variables to simulate semaphore values
int mutex = 1;
int full = 0;
int empty = 3;
int x = 0;

// Function prototypes
void producer();
void consumer();
int wait(int s);
int signal(int s);

int main()
{
    int n;
    std::cout << "\n1. Producer\n2. Consumer\n3. Exit";
    while (true)
    {
        std::cout << "\nEnter your choice: ";
        std::cin >> n;

        switch (n)
        {
            case 1:
                if (mutex == 1 && empty != 0)
                    producer();
                else
                    std::cout << "Buffer is full\n";
                break;
            case 2:
                if (mutex == 1 && full != 0)
                    consumer();
                else
                    std::cout << "\nBuffer is empty\n";
                break;
            case 3:
                std::cout << "Exiting program.\n";
                return 0; // Graceful termination
            default:
                std::cout << "Invalid choice\n";
        }
    }
}
```

```
    }  
    return 0;  
}
```

```
int wait(int s)  
{  
    return (--s);  
}
```

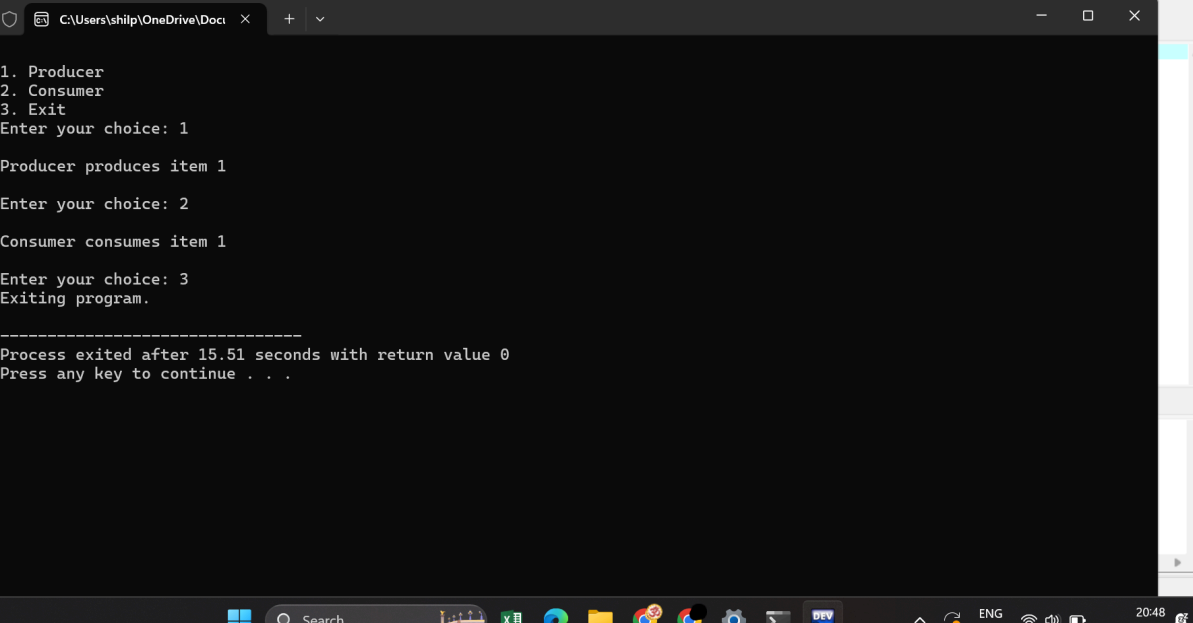
```
int signal(int s)  
{  
    return (++s);  
}
```

```
void producer()  
{  
    mutex = wait(mutex);  
    full = signal(full);  
    empty = wait(empty);  
    x++;  
    std::cout << "\nProducer produces item " << x << "\n";  
    mutex = signal(mutex);  
}
```

```
void consumer()  
{  
    mutex = wait(mutex);  
    full = wait(full);  
    empty = signal(empty);  
    std::cout << "\nConsumer consumes item " << x << "\n";  
    x--;  
    mutex = signal(mutex);  
}
```

#output:

```
C:\Users\shilp\OneDrive\Docu x + v
1. Producer
2. Consumer
3. Exit
Enter your choice: 1
Producer produces item 1
Enter your choice: 2
Consumer consumes item 1
Enter your choice: 3
Exiting program.
-----
Process exited after 15.51 seconds with return value 0
Press any key to continue . . .
```



The screenshot shows a Windows command prompt window with a dark background. The window title bar indicates the file path is C:\Users\shilp\OneDrive\Docu. The program output shows a menu with three options: 1. Producer, 2. Consumer, and 3. Exit. The user enters '1', and the program outputs 'Producer produces item 1'. The user then enters '2', and the program outputs 'Consumer consumes item 1'. Finally, the user enters '3', and the program outputs 'Exiting program.' followed by a series of dashes. Below the dashes, it says 'Process exited after 15.51 seconds with return value 0' and 'Press any key to continue . . .'. The Windows taskbar is visible at the bottom, showing the Start button, Search bar, and several application icons including File Explorer, Microsoft Edge, and Google Chrome. The system tray on the right shows the date and time as 20:48 on 27-07-2024.