Producer Consumer Problem

Theory: Producer consumer problem is also known as bounded buffer problem. In this problem we have two processes, producer and consumer, who share a fixed size buffer. Producer work is to produce data or items and put them in a buffer. Consumer work is to remove data from the buffer and consume it. We have to make sure that producers do not produce data when the buffer is full and consumers do not remove data when the buffer is empty.

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

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

int main()
{
    int n;
    void producer();
    void consumer();
    int wait(int);
    int signal(int);
    printf("\n1.Producer\n2.Consumer\n3.Exit");
    while(1)
    {
        printf("\nEnter your choice:");
        scanf("%d",&n);
        switch(n)
        {
            case 1:if(empty!=0)

                            producer();
                    else

                    printf("Buffer is full!!");

                    break;
            case 2:if(full!=0)

                            consumer();
                    else

                    printf("Buffer is empty!!");

                    break;
            case 3:

                    exit(0);
                    break;
        }
```

```
        }

        return 0;
}

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

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

void producer()
{
        full=signal(full);        //inserting so increasing full
        empty=wait(empty);    // and decreasing empty
        x++;
        printf("\nProducer produces the item %d",x);
}

void consumer()
{
        full=wait(full);            // removing so decreasing full
        empty=signal(empty);            //and increasing empty
        printf("\nConsumer consumes item %d",x);
        x--;
}
```

Output:
1.Producer
2.Consumer
3.Exit
Enter your choice:1
Producer produces the item 1
Enter your choice:2
Consumer consumes item 1
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:1
Producer produces the item 3
Enter your choice:1
Buffer is full!!
Enter your choice:3

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