Ex 8 PRODUCER – CONSUMER USING

SEMAPHORES

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

#define SIZE 3

int main() {
    int buffer[SIZE];
    int in = 0, count = 0, item = 0;
    sem_t mutex, empty, full;
    int choice;

    sem_init(&mutex, 0, 1);
    sem_init(&empty, 0, SIZE);
    sem_init(&full, 0, 0);

    while (1) {
        printf("1. Producer\n");
        printf("2. Consumer\n");
        printf("3. Exit\n");
        printf("Enter your choice:");
        scanf("%d", &choice);

        if (choice == 1) {
            if (count == SIZE) {
                printf("Buffer is full!!\n");
                continue;
            }

            sem_wait(&empty);
            sem_wait(&mutex);

            item++;
            buffer[in] = item;
            in = (in + 1) % SIZE;
            count++;

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

            sem_post(&mutex);
            sem_post(&full);
        }
        else if (choice == 2) {
            if (count == 0) {
                printf("Buffer is empty!!\n");
                continue;
            }

            sem_wait(&full);
            sem_wait(&mutex);

            int out = (in - count + SIZE) % SIZE;
            printf("Consumer consumes item\n%d\n", buffer[out]);
            count--;

            sem_post(&mutex);
            sem_post(&empty);
        }
        else if (choice == 3) {
            printf("Exiting...\n");
            sem_destroy(&mutex);
            sem_destroy(&empty);
            sem_destroy(&full);
            break;
        }
        else {
            printf("Invalid choice!\n");
        }
    }

    return 0;
```

```
rbsk05@fedora:~$ vi semaphores.c
rbsk05@fedora:~$ gcc semaphores.c
rbsk05@fedora:~$ ./a.out
1. Producer
2. Consumer
3. Exit
Enter your choice:1
Producer produces the item 1
1. Producer
2. Consumer
3. Exit
Enter your choice:2
Consumer consumes item
1
1. Producer
2. Consumer
3. Exit
Enter your choice:2
Buffer is empty!!
1. Producer
2. Consumer
3. Exit
Enter your choice:1
Producer produces the item 2
1. Producer
2. Consumer
3. Exit
Enter your choice:2
Consumer consumes item
2
1. Producer
2. Consumer
3. Exit
Enter your choice:3
Exiting...
rbsk05@fedora:~$
```