**5. Implement the Producer-Consumer problem using semaphores.**

#include<stdio.h>

#include<stdlib.h>

int mutex=1,full=0,empty=3,x=0;

void main()

{

int n;

void producer();

void consumer();

int wait(int);

int signal(int);

printf("\n1.PRODUCER\n2.CONSUMER\n3.EXIT\n");

while(1)

{

printf("\nENTER YOUR CHOICE\n");

scanf("%d",&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;

}

}

}

int wait(int s)

{

return(--s);

}

int signal(int s)

{

return(++s);

}

void producer()

{

mutex=wait(mutex);

full=signal(full);

empty=wait(empty);

x++;

printf("\nproducer produces the item%d",x);

mutex=signal(mutex);

}

void consumer()

{

mutex=wait(mutex);

full=wait(full);

empty=signal(empty);

printf("\n consumer consumes item%d",x);

x--;

mutex=signal(mutex);

}

**OUTPUT:**

1.PRODUCER

2.CONSUMER

3.EXIT

ENTER YOUR CHOICE

1

producer produces the item1

ENTER YOUR CHOICE

1

producer produces the item2

ENTER YOUR CHOICE

1

producer produces the item3

ENTER YOUR CHOICE

1

BUFFER IS FULL

ENTER YOUR CHOICE

2

consumer consumes item3

ENTER YOUR CHOICE

1

producer produces the item3

ENTER YOUR CHOICE

1

BUFFER IS FULL

ENTER YOUR CHOICE

2

consumer consumes item3

ENTER YOUR CHOICE

2

consumer consumes item2

ENTER YOUR CHOICE

2

consumer consumes item1

ENTER YOUR CHOICE

2

BUFFER IS EMPTY

ENTER YOUR CHOICE

1

producer produces the item1

ENTER YOUR CHOICE

2

consumer consumes item1

ENTER YOUR CHOICE

2

BUFFER IS EMPTY