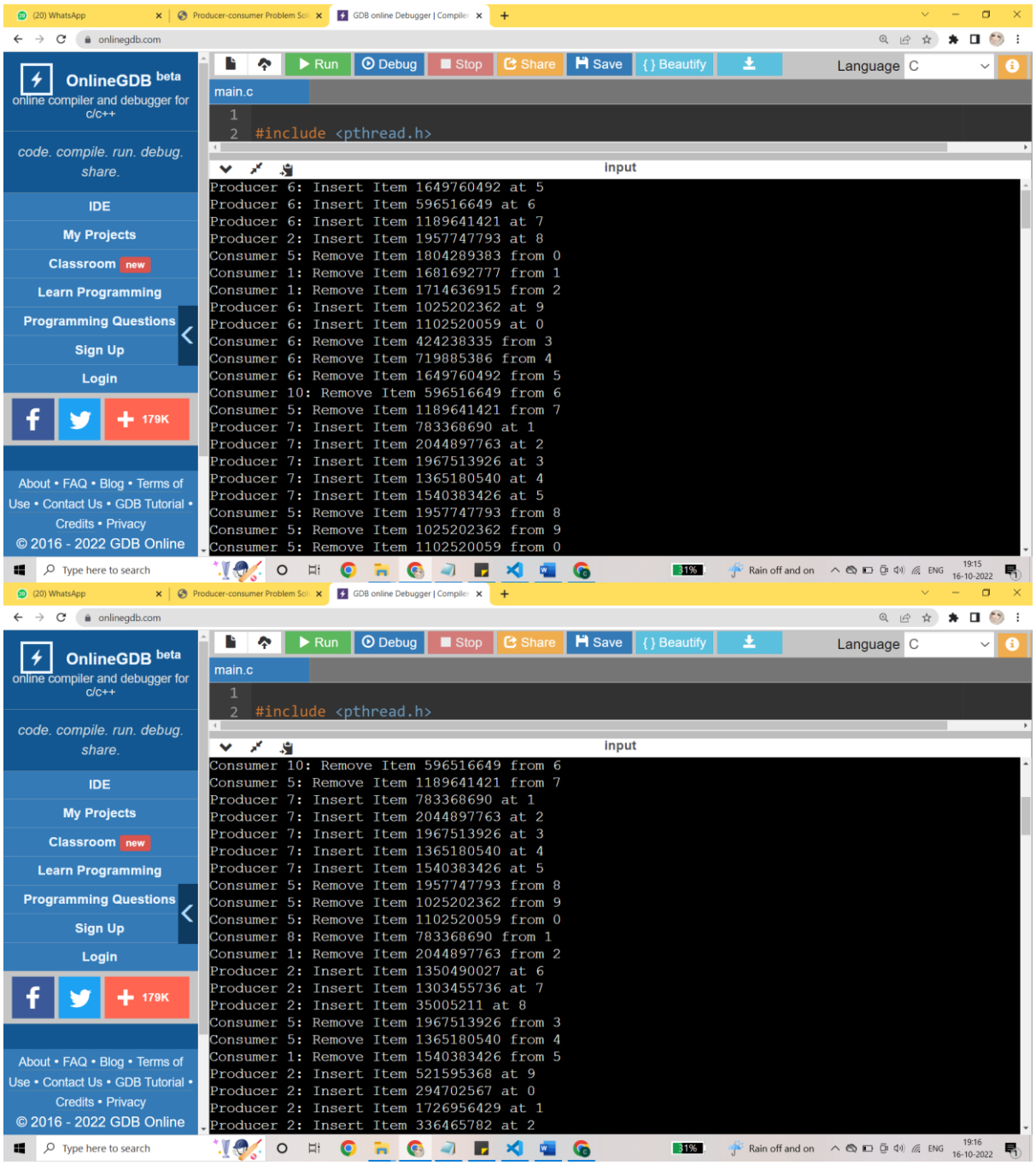
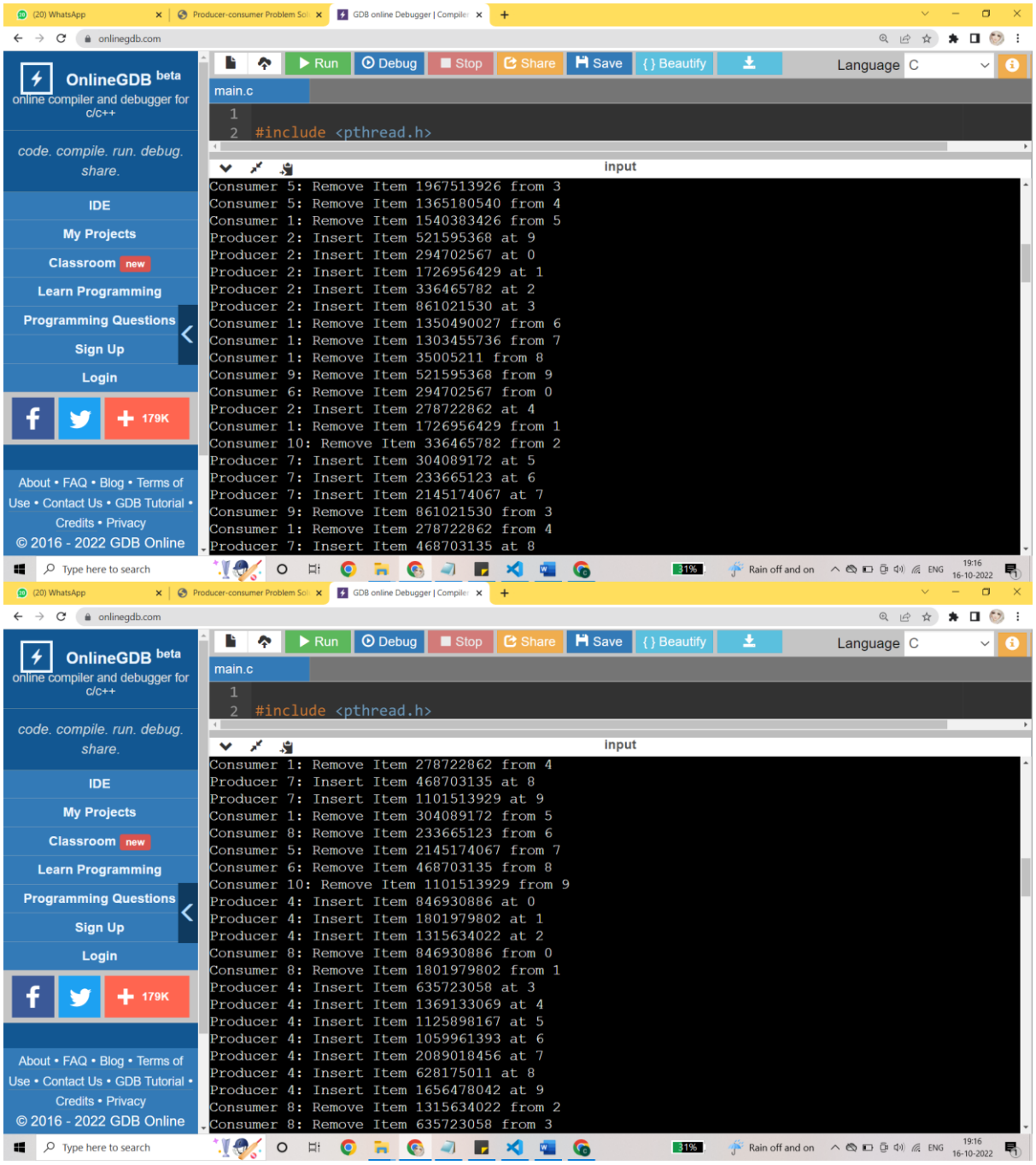
CODE

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

#define MaxItems 10 // Maximum items a producer can produce or a consumer can consume
#define BufferSize 10 // Size of the buffer

sem_t empty;
sem_t full;
int in = 0;
int out = 0;
int buffer[BufferSize];
pthread_mutex_t mutex;

void *producer(void *pno)
{
   int item;
   for(int i = 0; i < MaxItems; i++) {
      item = rand(); // Produce an random item
      sem_wait(&empty);
      pthread_mutex_lock(&mutex);
      buffer[in] = item;
      printf("Producer %d: Insert Item %d at %d\n", *((int *)pno),buffer[in],in);
      in = (in+1)%BufferSize;
      pthread_mutex_unlock(&mutex);
      sem_post(&full);
   }
}
void *consumer(void *cno)
{
   for(int i = 0; i < MaxItems; i++) {
      sem_wait(&full);
      pthread_mutex_lock(&mutex);
      int item = buffer[out];
      printf("Consumer %d: Remove Item %d from %d\n",*((int *)cno),item, out);
      out = (out+1)%BufferSize;
      pthread_mutex_unlock(&mutex);
      sem_post(&empty);
   }
}

int main()
{

   pthread_t pro[10],con[10];
   pthread_mutex_init(&mutex, NULL);
   sem_init(&empty,0,BufferSize);
   sem_init(&full,0,0);

   int a[10] = {1,2,3,4,5,6,7,8,9,10}; //Just used for numbering the producer and consumer

   for(int i = 0; i < 10; i++) {
      pthread_create(&pro[i], NULL, (void *)producer, (void *)&a[i]);
   }
   for(int i = 0; i < 10; i++) {
      pthread_create(&con[i], NULL, (void *)consumer, (void *)&a[i]);
   }
```

```
    for(int i = 0; i < 10; i++) {
        pthread_join(pro[i], NULL);
    }
    for(int i = 0; i < 10; i++) {
        pthread_join(con[i], NULL);
    }

    pthread_mutex_destroy(&mutex);
    sem_destroy(&empty);
    sem_destroy(&full);

    return 0;

}
```

OUTPUT




OnlineGDB beta
online compiler and debugger for c/c++
code. compile. run. debug. share.
IDE
My Projects
Classroom new
Learn Programming
Programming Questions
Sign Up
Login
179K
About • FAQ • Blog • Terms of Use • Contact Us • GDB Tutorial • Credits • Privacy
© 2016 - 2022 GDB Online
Run
Debug
Stop
Share
Save
{ } Beautify
Language C
main.c
1 #include <pthread.h>
input
Consumer 5: Remove Item 1967513926 from 3
Consumer 5: Remove Item 1365180540 from 4
Consumer 1: Remove Item 1540383426 from 5
Producer 2: Insert Item 521595368 at 9
Producer 2: Insert Item 294702567 at 0
Producer 2: Insert Item 1726956429 at 1
Producer 2: Insert Item 336465782 at 2
Producer 2: Insert Item 861021530 at 3
Consumer 1: Remove Item 1350490027 from 6
Consumer 1: Remove Item 1303455736 from 7
Consumer 1: Remove Item 35005211 from 8
Consumer 9: Remove Item 521595368 from 9
Consumer 6: Remove Item 294702567 from 0
Producer 2: Insert Item 278722862 at 4
Consumer 1: Remove Item 1726956429 from 1
Consumer 10: Remove Item 336465782 from 2
Producer 7: Insert Item 304089172 at 5
Producer 7: Insert Item 233665123 at 6
Producer 7: Insert Item 2145174067 at 7
Consumer 9: Remove Item 861021530 from 3
Consumer 1: Remove Item 278722862 from 4
Producer 7: Insert Item 468703135 at 8
Type here to search
Rain off and on
ENG
19:16
16-10-2022

OnlineGDB beta
online compiler and debugger for c/c++
code. compile. run. debug. share.
IDE
My Projects
Classroom new
Learn Programming
Programming Questions
Sign Up
Login
179K
About • FAQ • Blog • Terms of Use • Contact Us • GDB Tutorial • Credits • Privacy
© 2016 - 2022 GDB Online
Run
Debug
Stop
Share
Save
{ } Beautify
Language C
main.c
1 #include <pthread.h>
input
Consumer 1: Remove Item 278722862 from 4
Producer 7: Insert Item 468703135 at 8
Producer 7: Insert Item 1101513929 at 9
Consumer 1: Remove Item 304089172 from 5
Consumer 8: Remove Item 233665123 from 6
Consumer 5: Remove Item 2145174067 from 7
Consumer 6: Remove Item 468703135 from 8
Consumer 10: Remove Item 1101513929 from 9
Producer 4: Insert Item 846930886 at 0
Producer 4: Insert Item 1801979802 at 1
Producer 4: Insert Item 1315634022 at 2
Consumer 8: Remove Item 846930886 from 0
Consumer 8: Remove Item 1801979802 from 1
Producer 4: Insert Item 635723058 at 3
Producer 4: Insert Item 1369133069 at 4
Producer 4: Insert Item 1125898167 at 5
Producer 4: Insert Item 1059961393 at 6
Producer 4: Insert Item 2089018456 at 7
Producer 4: Insert Item 628175011 at 8
Producer 4: Insert Item 1656478042 at 9
Consumer 8: Remove Item 1315634022 from 2
Consumer 8: Remove Item 635723058 from 3
Type here to search
Rain off and on
ENG
19:16
16-10-2022