PRODUCER CONSUMER - SYNCHRONIZATION CONSTRUCTS

Name - Raagul N

Reg.No. - 16BCE1241

Course - Parallel and Distributed Computing

Course Code - CSE 4001

Faculty - Prof. Harini S.

PROBLEM STATEMENT -

Write a parallel program to parallelize producer consumer problem.

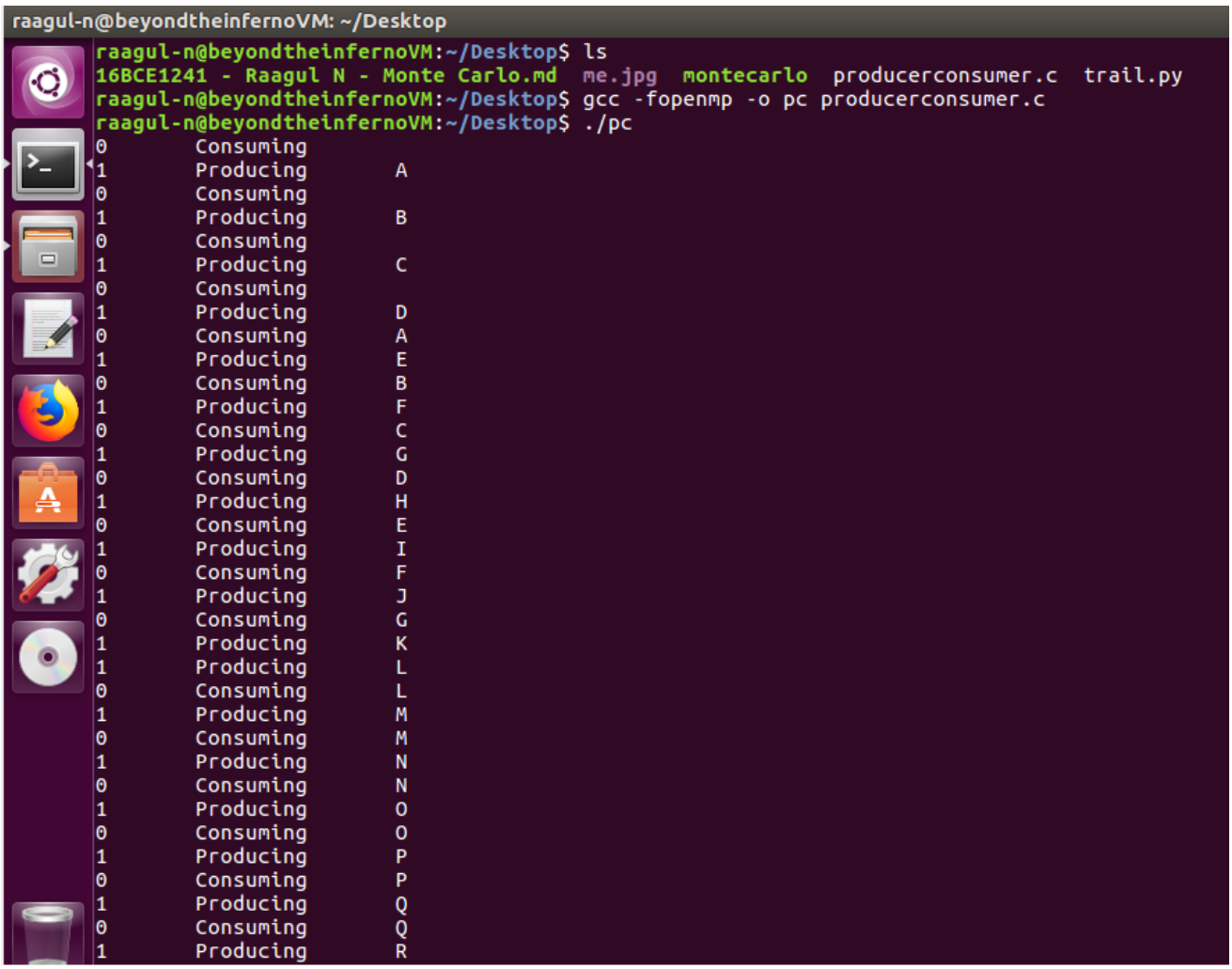
CODE -

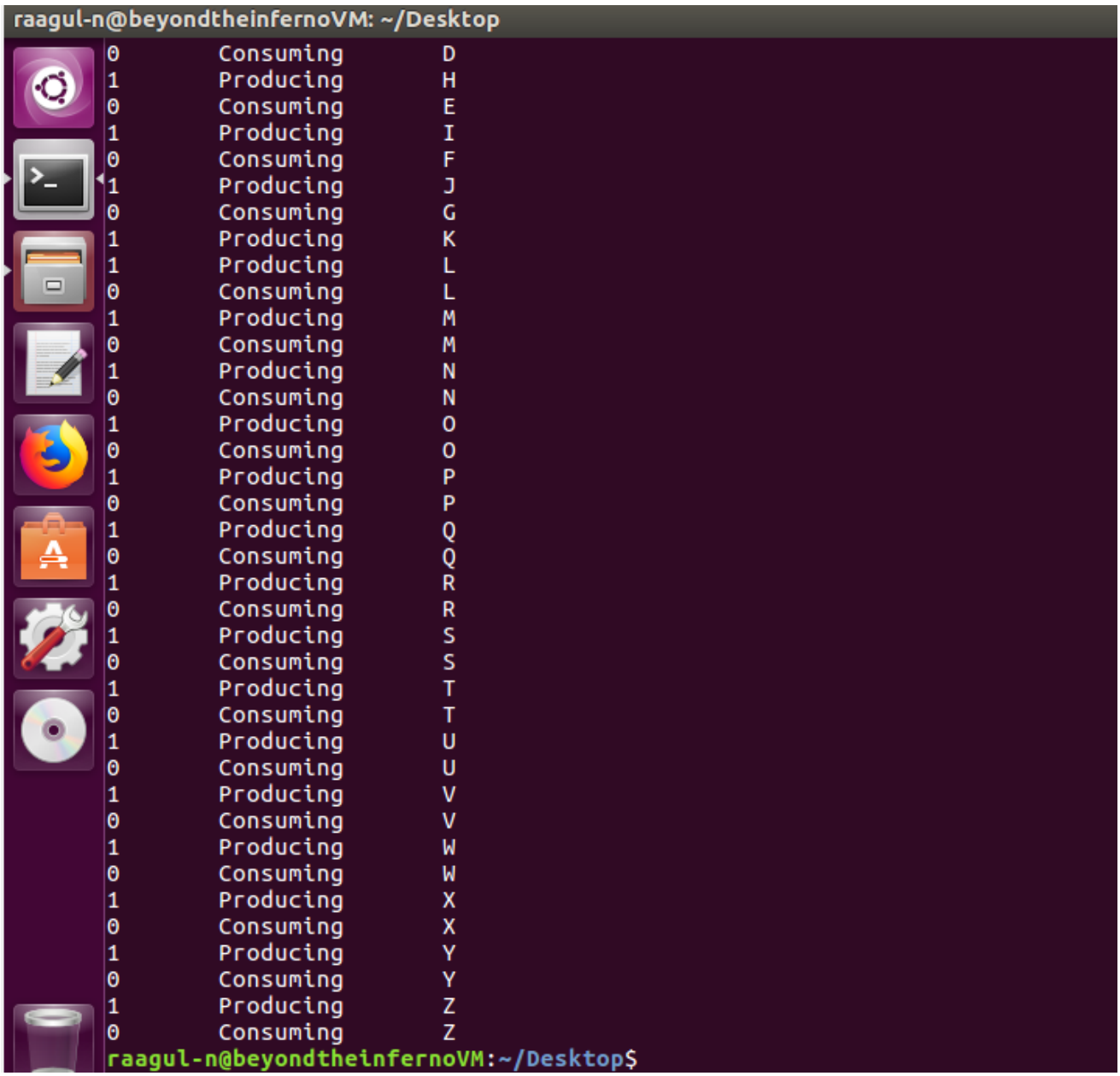
```
#include <stdio.h>
#include <unistd.h>
#include <omp.h>
#define SIZE 4
#define NUM 26

char buffer[SIZE];
int in = 0;
int out = 0;
int count = 0;
int empty = 1;
int full = 0;
int i,j;

void put(char item)
{
  buffer[in] = item;
  in = (in + 1) % SIZE;
  count++;
  if (count == SIZE)
    full = 1;
  if (count == 1)
    empty = 0;
}

```

```
26  void producer(int tid)
27  {
28    char item;
29    while( i < NUM)
30    {
31      #pragma omp critical
32      {
33      item = 'A' + (i % 26);
34      put(item);
35      i++;
36      printf("%d\tProducing\t%c\n",tid, item);
37      }
38      sleep(1);
39    }
40  }
41
42  char get()
43  {
44    char item;
45    item = buffer[out];
46    out = (out + 1) % SIZE;
47    count--;
48    if (count == 0)
49      empty = 1;
50    if (count == (SIZE-1))
51      full = 0;
52    return item;
53  }
54
55  void consumer(int tid)
56  {
57    char item;
58    while(j < NUM)
59    {
60      #pragma omp critical
61      {
62        j++;
63        item = get();
64        printf("%d\tConsuming\t%c\n",tid, item);
65      }
66      sleep(1);
67    }
68  }
69
70  int main()
71  {
72    int tid;
73    i=j=0;
74    #pragma omp parallel firstprivate(i,j) private(tid)
75    {
76      tid=omp_get_thread_num();
```

```
77      if(tid%2==1)
78        producer(tid);
79      else
80        consumer(tid);
81    }
82  }
```

OUTPUT -




raagul-n@beyondtheinfernoVM: ~/Desktop
0 Consuming D
1 Producing H
0 Consuming E
1 Producing I
0 Consuming F
1 Producing J
0 Consuming G
1 Producing K
1 Producing L
0 Consuming L
1 Producing M
0 Consuming M
1 Producing N
0 Consuming N
1 Producing O
0 Consuming O
1 Producing P
0 Consuming P
1 Producing Q
0 Consuming Q
1 Producing R
0 Consuming R
1 Producing S
0 Consuming S
1 Producing T
0 Consuming T
1 Producing U
0 Consuming U
1 Producing V
0 Consuming V
1 Producing W
0 Consuming W
1 Producing X
0 Consuming X
1 Producing Y
0 Consuming Y
1 Producing Z
0 Consuming Z
raagul-n@beyondtheinfernoVM:~/Desktop$