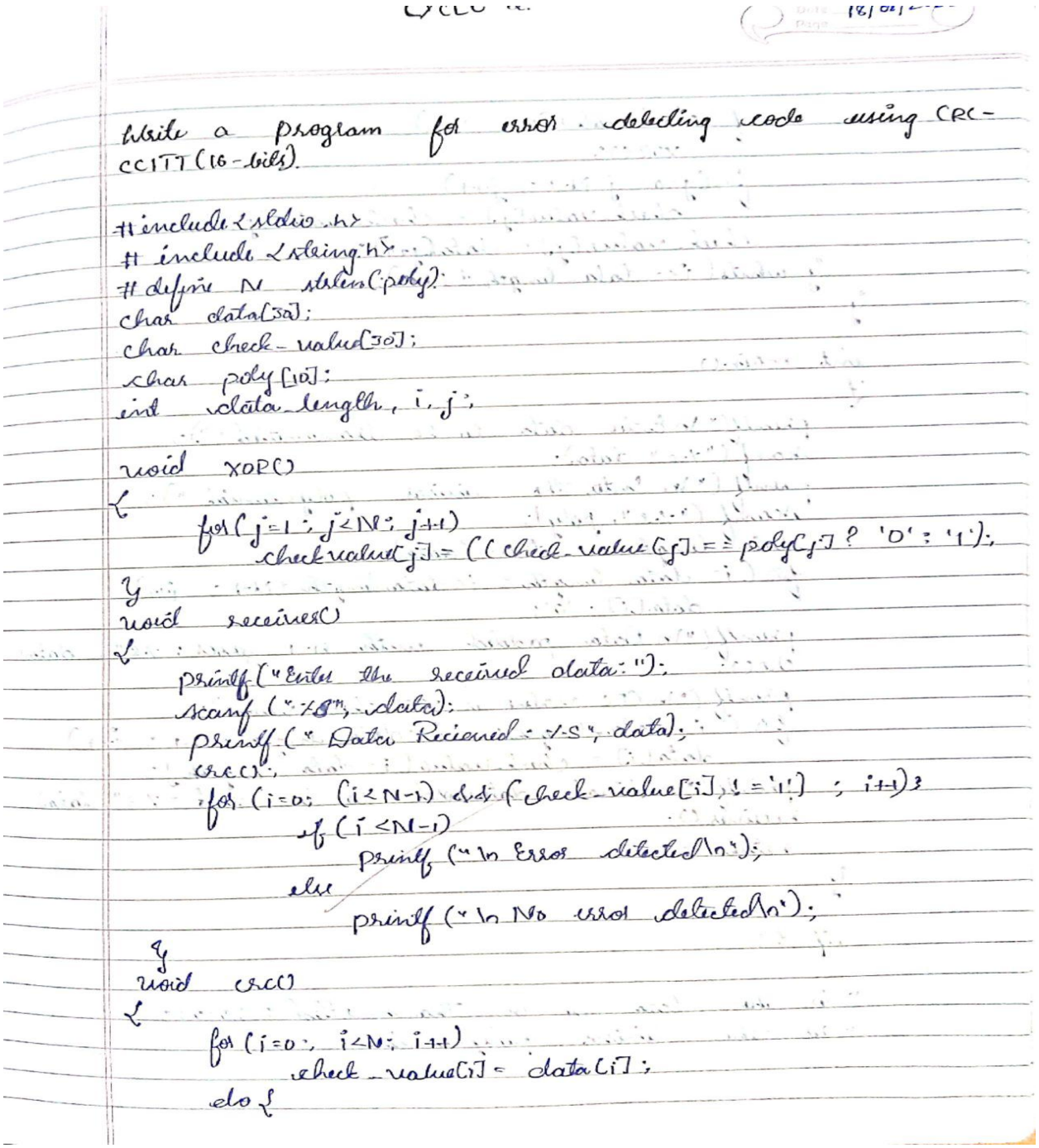
WEEK 13
Program 1

Write a program for error detecting code using CRC-CCITT (16-bits).

Observation:



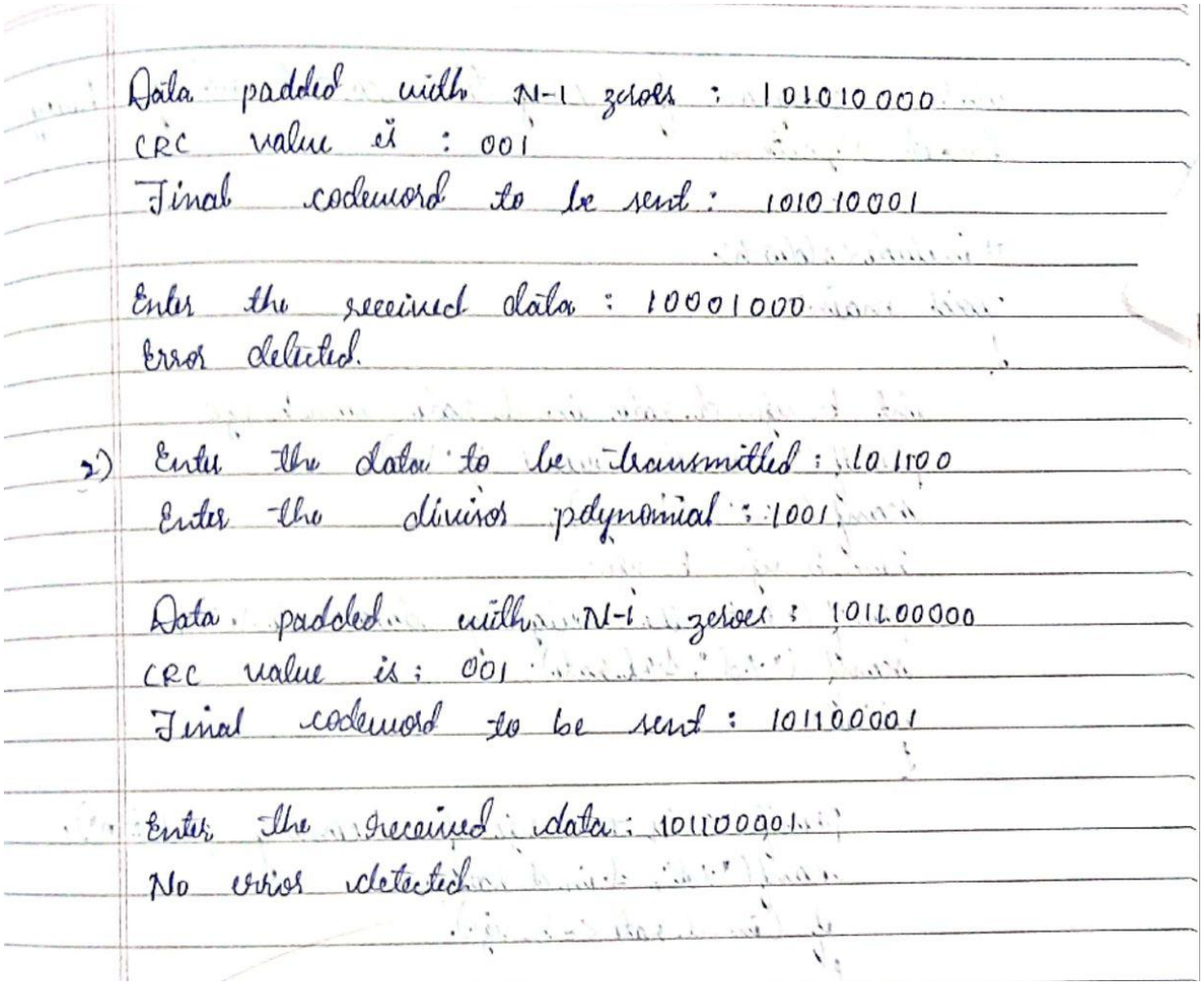
Write a program for error detecting code using CRC-CCITT (16-bits).

```
#include<stdio.h>
#include<string.h>
#define N strlen(poly)
char data[30];
char check_value[30];
char poly[10];
int data_length, i, j;

void XOR()
{
    for(j=1; j<N; j++)
        check_value[j]=((check_value[j]==poly[j])?'0':'1');
}
void receiver()
{
    printf("Enter the received data: ");
    scanf("%s", data);
    printf("Data Recieved = %s", data);
    crc();
    for(i=0; (i<N-1)&&(check_value[i]!='1'); i++);
        if(i<N-1)
            printf("\n Error detected\n");
        else
            printf("\n No error detected\n");
}
void crc()
{
    for(i=0; i<N; i++)
        check_value[i]=data[i];
    do{
```

```
        if (check_value[0] == '1')
            XOR();
        for(j=0; j<N-1; j++)
            check_value[j] = check_value[j+1];
        check_value[j] = data[j+1];
    } while(i<= data_length + N-1);
}

int main()
{
    printf("\nEnter data to be transmitted: ");
    scanf("%s", data);
    printf("\nEnter the divisor polynomial: ");
    scanf("%s", poly);
    data_length = strlen(data);
    for(i= data_length; i<data_length+N-1; i++)
        data[i] = '0';
    printf("\nData padded with n-1 zeros : %s", data);
    crc();
    printf("\nCRC value is %s", check_value);
    for(i= data_length; i<data_length+N-1; i++)
        data[i] = check_value[i-data_length];
    printf("\nFinal datawords to be sent = %s", data);
    receiver();
    return 0;
}
```

Output :

Enter the data to be transmitted : 101010
Enter the divisor polynomial : 101



CODE:

```
#include<stdio.h>
#include<string.h>
#define N strlen(gen_poly)
char data[28];
char check_value[28];
char gen_poly[10];
int data_length,i,j;
void XOR(){
   for(j = 1;j < N; j++)
   check_value[j] = (( check_value[j] == gen_poly[j])?'0':'1');

}
```

```
void receiver(){
   printf("Enter the received data: ");
   scanf("%s", data);
   printf("Data received: %s", data);
   crc();
   for(i=0;(i<N-1) && (check_value[i]!='1');i++);
      if(i<N-1)
         printf("\nError detected\n\n");
      else
         printf("\nNo error detected\n\n");
}

void crc(){
   for(i=0;i<N;i++)
      check_value[i]=data[i];
   do{
      if(check_value[0]=='1')
         XOR();
      for(j=0;j<N-1;j++)
         check_value[j]=check_value[j+1];
      check_value[j]=data[i++];
   }while(i<=data_length+N-1);
}

int main()
{
   printf("\nEnter data to be transmitted: ");
   scanf("%s",data);
   printf("\n Enter the Generating polynomial: ");
   scanf("%s",gen_poly);
   data_length=strlen(data);
   for(i=data_length;i<data_length+N-1;i++)
      data[i]='0';
   printf("\n Data padded with n-1 zeros : %s",data);
   crc();
```

```
    printf("\nCRC or Check value is : %s",check_value);
    for(i=data_length;i<data_length+N-1;i++)
        data[i]=check_value[i-data_length];
    printf("\n Final data to be sent : %s",data);
    receiver();
        return 0;
}
```

OUTPUT:

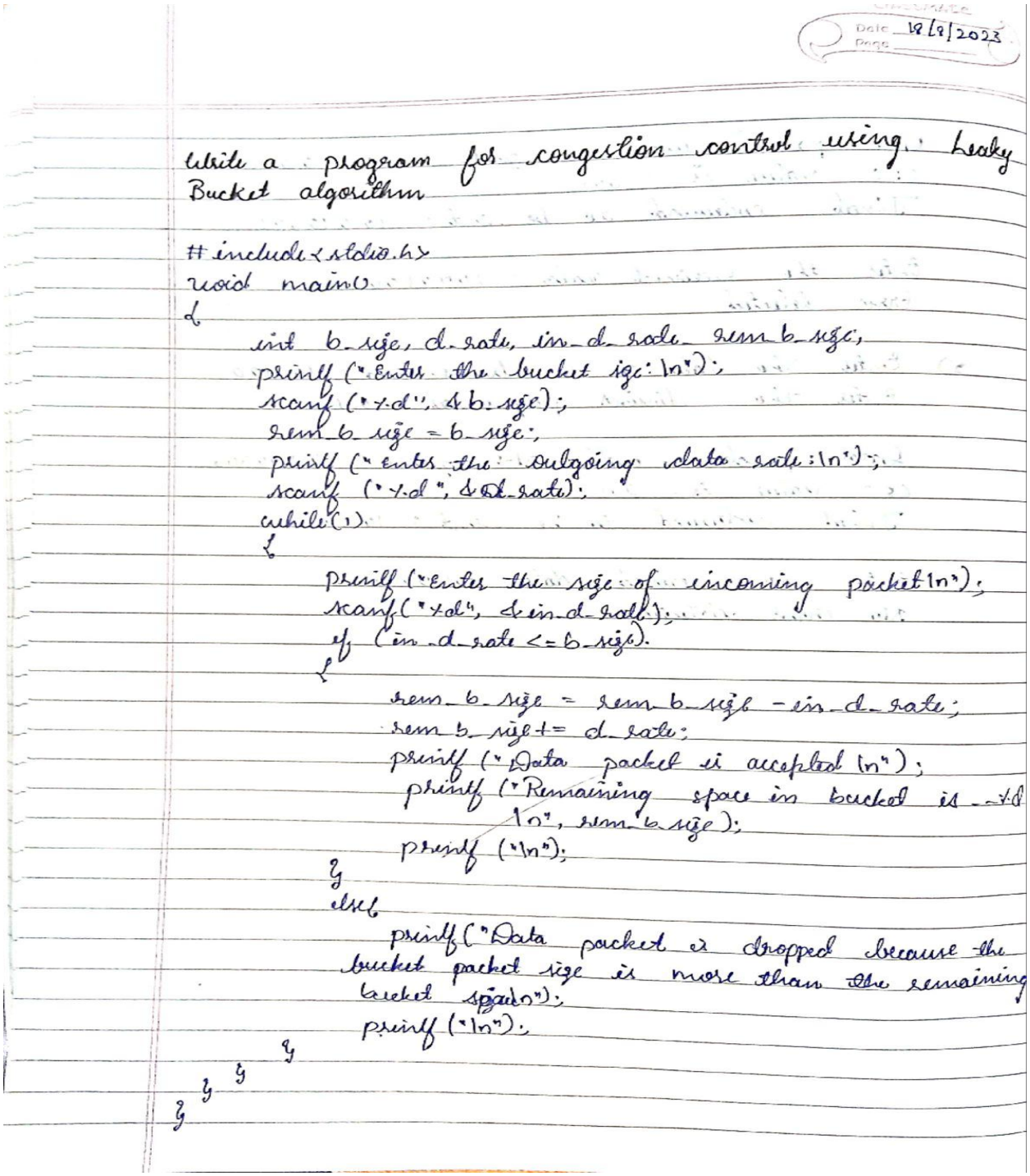
```
Enter data to be transmitted: 10001000000100001

 Enter the Generating polynomial: 1011

 Data padded with n-1 zeros : 10001000000100001000
CRC or Check value is : 100
 Final data to be sent : 10001000000100001100
Enter the received data: 10001000000100001100
Data received: 10001000000100001100
No error detected
```

```
  Enter data to be transmitted: 10001000000100001

   Enter the Generating polynomial: 1011

   Data padded with n-1 zeros : 10001000000100001000
  CRC or Check value is : 100
   Final data to be sent : 10001000000100001100
  Enter the received data: 10010000000100001100
  Data received: 10010000000100001100
  Error detected
```

Program 2

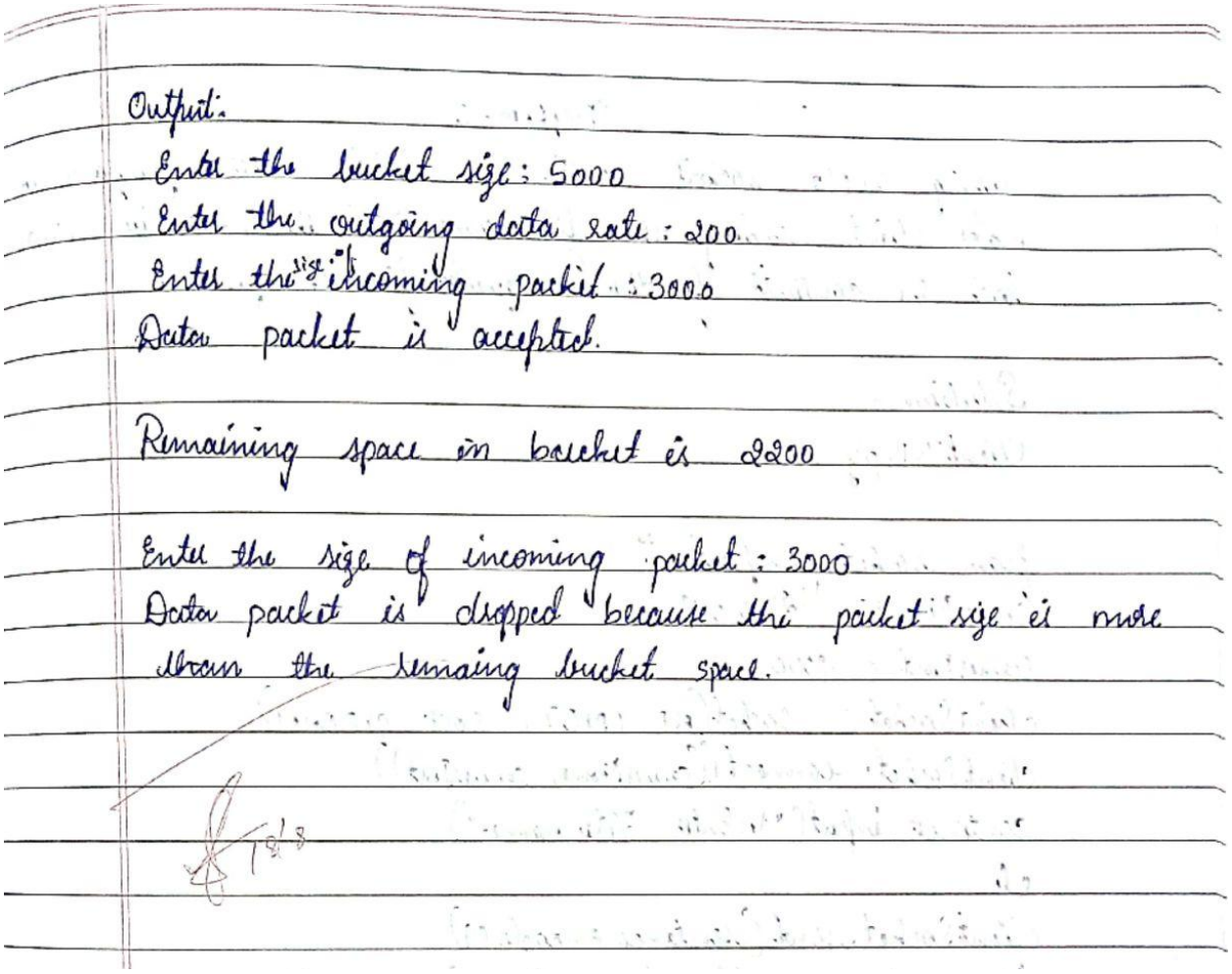
Write a program for congestion control using Leaky bucket algorithm.

Observation:



Write a program for congestion control using Leaky Bucket algorithm

```
#include<stdio.h>
void main()
{
    int b_size, d_rate, in_d_rate, rem_b_size;
    printf("Enter the bucket size:\n");
    scanf("%d", &b_size);
    rem_b_size = b_size;
    printf("enter the outgoing data rate:\n");
    scanf("%d", &d_rate);
    while(1)
    {
        printf("Enter the size of incoming packet\n");
        scanf("%d", &in_d_rate);
        if (in_d_rate <= b_size)
        {
            rem_b_size = rem_b_size - in_d_rate;
            rem_b_size += d_rate;
            printf("Data packet is accepted\n");
            printf("Remaining space in bucket is %d
                \n", rem_b_size);
            printf("\n");
        }
        else
            printf("Data packet is dropped because the
            bucket packet size is more than the remaining
            bucket space\n");
            printf("\n");
    }
}
```



CODE:

```
#include<stdio.h>
void main()
{
   int b_size,d_rate,in_d_rate,rem_b_size;
   printf("Enter the bucket size:\n");
   scanf("%d",&b_size);
   rem_b_size=b_size;
   printf("Enter the outgoing data rate:\n");
   scanf("%d",&d_rate);
   while(1)
   {
```

```
    printf("Enter the size of incoming packet\n");
    scanf("%d",&in_d_rate);
    if(in_d_rate<=b_size)
    {
       if(in_d_rate<=rem_b_size)
       {
       rem_b_size=rem_b_size-in_d_rate;
       rem_b_size=rem_b_size+d_rate;
       printf("Data packet is accepted\n");
       printf("Remaining space in bucket is.... %d\n",rem_b_size);
       printf("\n");
       }
       else{
       printf("Data packet is dropped because the bucket size is less than the packet
size\n");
       printf("\n");
    }
    }
    }
}
```

OUTPUT: