

cn2.cpp

My programs > C++ > cn2.cpp > main()

```
1 // Done by Kartik Joshi 3932
2
3 #include<iostream>
4 #include <time.h>
5 #include <cstdlib>
6 #include<ctime>
7 #include <unistd.h>
8 using namespace std;
9 class timer {
10     private:
11         unsigned long begTime;
12     public:
13         void start() {
14             begTime = clock();
15         }
16         unsigned long elapsedTime() {
17             return ((unsigned long) clock() - begTime) / CLOCKS_PER_SEC;
18         }
19         bool isTimeout(unsigned long seconds) {
20             return seconds >= elapsedTime();
21         }
22 };
23 int main()
24 {
25     int frames[] = {1,2,3,4,5,6,7,8,9,10};
26     unsigned long seconds = 5;
27     srand(time(NULL));
28     timer t;
29     cout<<"\nSender has to send frames : ";
30     for(int i=0;i<10;i++)
31         cout<<frames[i]<<" ";
32     cout<<endl;
33     int count = 0;
34     bool delay = false;
35     cout<<endl<<"\nSender\t\t\t\tReceiver"<<endl;
36     do
37     {
38         bool timeout = false;
39         cout<<"\nSending Frame are-> "<<frames[count];
40         cout<<flush;
```

cn2.cpp X

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```
36 do
37 {
38     bool timeout = false;
39     cout<<"\nSending Frame are-> "<<frames[count];
40     cout.flush();
41     cout<<"\t\t";
42     t.start();
43     if(rand()%2)
44     {
45         int to = 24600 + rand()%(64000 - 24600) + 1;
46         for(int i=0;i<64000;i++)
47             for(int j=0;j<to;j++) {}
48     }
49     if(t.elapsedTime() <= seconds)
50     {
51         cout<<"\nReceived Frame are -> "<<frames[count]<<" ";
52         if(delay)
53         {
54             cout<<"\nDUPLICATE";
55             delay = false;
56         }
57         cout<<endl;
58         count++;
59     }
60     else
61     {
62         cout<<"---"<<endl;
63         cout<<"\nTimeout"<<endl;
64         timeout = true;
65     }
66     t.start();
67     if(rand()%2 || !timeout)
68     {
69         int to = 24600 + rand()%(64000 - 24600) + 1;
70         for(int i=0;i<64000;i++)
71             for(int j=0;j<to;j++) {}
72         if(t.elapsedTime() > seconds )
73         {
74             cout<<"\nDELAYED ACK"<<endl;
75         }
76     }
77 }
```

cn2.cpp

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```
49 {t.elapsedTime() <= seconds)
50 {
51     cout<<"\nReceived Frame are -> "<<frames[count]<<" ";
52     if(delay)
53     {
54         cout<<"\nDUPLICATE";
55         delay = false;
56     }
57     cout<<endl;
58     count++;
59 }
60 else
61 {
62     cout<<"---"<<endl;
63     cout<<"\ntimeout"<<endl;
64     timeout = true;
65 }
66 t.start();
67 if(rand()%2 || !timeout)
68 {
69     int to = 24600 + rand()%(64000 - 24600) + 1;
70     for(int i=0;i<64000;i++)
71         for(int j=0;j<to;j++) {}
72     if(t.elapsedTime() > seconds )
73     {
74         cout<<"\nDELAYED ACK"<<endl;
75         count--;
76         delay = true;
77     }
78     else if(!timeout)
79         cout<<"\nACKNOWLEDGMENT : "<<frames[count]-1<<endl;
80 }
81 }while(count!=10);
82 return 0;
83 }
```

Windows PowerShell

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Install the latest PowerShell for new features and improvements! <https://aka.ms/PSWindows>

PS E:\My programs> cd "e:\My programs\C++\" ; if (\$?) { g++ cn2.cpp -o cn2 } ; if (\$?) { .\cn2 }

Sender has to send frames : 1 2 3 4 5 6 7 8 9 10

Sender Receiver

Sending Frame are-> 1

Received Frame are -> 1

DELAYED ACK

Sending Frame are-> 1

Timeout

Sending Frame are-> 1

Received Frame are -> 1

DUPLICATE

DELAYED ACK

Sending Frame are-> 1

Received Frame are -> 1

DUPLICATE

DELAYED ACK

Sending Frame are-> 1

Received Frame are -> 1

DUPLICATE

DELAYED ACK

Sending Frame are-> 1

Received Frame are -> 1

DUPLICATE

DELAYED ACK

Sending Frame are-> 1

Timeout

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

DUPLICATE

ACKNOWLEDGMENT : 1

Sending Frame are-> 2
Received Frame are -> 2

DELAYED ACK

Sending Frame are-> 2 ---

Timeout

DELAYED ACK

Sending Frame are-> 1
Received Frame are -> 1
DUPLICATE

ACKNOWLEDGMENT : 1

Sending Frame are-> 2
Received Frame are -> 2

ACKNOWLEDGMENT : 2

Sending Frame are-> 3 ---

Timeout

Sending Frame are-> 3
Received Frame are -> 3

DELAYED ACK

Sending Frame are-> 3
Received Frame are -> 3
DUPLICATE

DELAYED ACK

Sending Frame are-> 3
Received Frame are -> 3
DUPLICATE

DELAYED ACK

Sending Frame are-> 3

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

DELAYED ACK

Sending Frame are-> 2

Received Frame are -> 2

DUPLICATE

DELAYED ACK

Sending Frame are-> 2

Timeout

Sending Frame are-> 2

Received Frame are -> 2

DUPLICATE

DELAYED ACK

Sending Frame are-> 2

Received Frame are -> 2

DUPLICATE

ACKNOWLEDGMENT : 2

Sending Frame are-> 3

Received Frame are -> 3

ACKNOWLEDGMENT : 3

Sending Frame are-> 4

Timeout

Sending Frame are-> 4

Received Frame are -> 4

DELAYED ACK

Sending Frame are-> 4

Received Frame are -> 4

DUPLICATE

DELAYED ACK

Sending Frame are-> 4

Received Frame are -> 4

DUPLICATE

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

DUPLICATE

DELAYED ACK

Sending Frame are-> 4
Received Frame are -> 4
DUPLICATE

DELAYED ACK

Sending Frame are-> 4
Received Frame are -> 4
DUPLICATE

ACKNOWLEDGMENT : 4

Sending Frame are-> 5
Received Frame are -> 5

ACKNOWLEDGMENT : 5

Sending Frame are-> 6
Received Frame are -> 6

ACKNOWLEDGMENT : 6

Sending Frame are-> 7
Received Frame are -> 7

ACKNOWLEDGMENT : 7

Sending Frame are-> 8 ---

Timeout

Sending Frame are-> 8
Received Frame are -> 8

ACKNOWLEDGMENT : 8

Sending Frame are-> 9
Received Frame are -> 9

ACKNOWLEDGMENT : 9

Sending Frame are-> 10
Received Frame are -> 10

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

DUPLICATE

ACKNOWLEDGMENT : 4

Sending Frame are-> 5
Received Frame are -> 5

ACKNOWLEDGMENT : 5

Sending Frame are-> 6
Received Frame are -> 6

ACKNOWLEDGMENT : 6

Sending Frame are-> 7
Received Frame are -> 7

ACKNOWLEDGMENT : 7

Sending Frame are-> 8 ---

Timeout

Sending Frame are-> 8
Received Frame are -> 8

ACKNOWLEDGMENT : 8

Sending Frame are-> 9
Received Frame are -> 9

ACKNOWLEDGMENT : 9

Sending Frame are-> 10
Received Frame are -> 10

DELAYED ACK

Sending Frame are-> 10 ---

Timeout

Sending Frame are-> 10
Received Frame are -> 10

DUPLICATE

ACKNOWLEDGMENT : 40063

PS E:\My programs\C++>