**PROGRAM NO – 3**

**Aim:** Implementation of stop and wait

**#include<iostream>**

**#include <time.h>**

**#include <cstdlib>**

**#include<ctime>**

**#include <unistd.h>**

**using namespace std;**

**class timer {**

**private:**

**unsigned long begTime;**

**public:**

**void start() {**

**begTime = clock();**

**}**

**unsigned long elapsedTime() {**

**return ((unsigned long) clock() - begTime) / CLOCKS\_PER\_SEC;**

**}**

**bool isTimeout(unsigned long seconds) {**

**return seconds >= elapsedTime();**

**}**

**};**

**int main()**

**{ cout<<"SUNIDHI SINGH 1901330100281"<<endl;**

**int frames[] = {1,2,3};**

**unsigned long seconds = 5;**

**srand(time(NULL));**

**timer t;**

**cout<<"Sender has to send frames : ";**

**for(int i=0;i<10;i++)**

**cout<<frames[i]<<" ";**

**cout<<endl;**

**int count = 0;**

**bool delay = false;**

**cout<<endl<<"Sender\t\t\t\t\tReceiver"<<endl;**

**do**

**{**

**bool timeout = false;**

**cout<<"Sending Frame : "<<frames[count];**

**cout.flush();**

**cout<<"\t\t";**

**t.start();**

**if(rand()%2)**

**{**

**int to = 24600 + rand()%(64000 - 24600) + 1;**

**for(int i=0;i<64000;i++)**

**for(int j=0;j<to;j++) {}**

**}**

**if(t.elapsedTime() <= seconds)**

**{**

**cout<<"Received Frame : "<<frames[count]<<" ";**

**if(delay)**

**{**

**cout<<"Duplicate";**

**delay = false;**

**}**

**cout<<endl;**

**count++;**

**}**

**else**

**{**

**cout<<"---"<<endl;**

**cout<<"Timeout"<<endl;**

**timeout = true;**

**}**

**t.start();**

**if(rand()%2 || !timeout)**

**{**

**int to = 24600 + rand()%(64000 - 24600) + 1;**

**for(int i=0;i<64000;i++)**

**for(int j=0;j<to;j++) {}**

**if(t.elapsedTime() > seconds )**

**{**

**cout<<"Delayed Ack"<<endl;**

**count--;**

**delay = true;**

**}**

**else if(!timeout)**

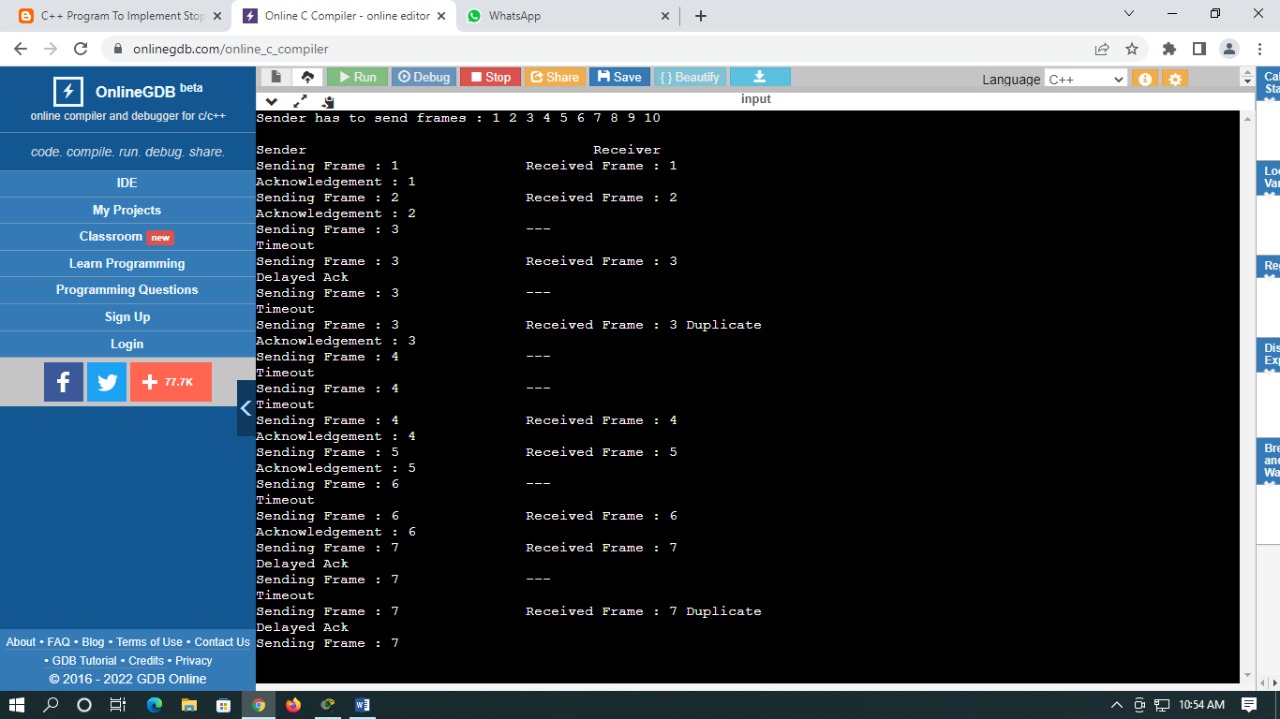
**cout<<"Acknowledgement : "<<frames[count]-1<<endl;**

**}**

**}while(count!=10);**

**return 0;**

**}**

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