3. Implementation of Sliding Window Protocol Select Repeat ARQ

Aim : Implementation of Sliding Window Protocol Select Repeat ARQ

Program

#include <stdio.h>

#include <stdlib.h>

#include <stdbool.h>

#define WINDOW\_SIZE 4

#define FRAME\_COUNT 8

// Data structure for frames

typedef struct {

int sequence\_number;

bool is\_acknowledged;

char data;

} Frame;

// Sender function

void sender(Frame frames[], int total\_frames) {

int base = 0;

int next\_seq = 0;

while (base < total\_frames) {

// Send frames in the window

for (int i = base; i < base + WINDOW\_SIZE && i < total\_frames; i++) {

if (!frames[i].is\_acknowledged) {

printf("Sending frame %d: %c\n", frames[i].sequence\_number, frames[i].data);

}

}

// Simulate acknowledgment reception

int ack;

printf("Enter the last acknowledged frame number (or -1 to exit): ");

scanf("%d", &ack);

if (ack == -1) {

break;

}

// Mark frames as acknowledged

for (int i = base; i <= ack; i++) {

frames[i].is\_acknowledged = true;

}

// Slide the window

while (base < total\_frames && frames[base].is\_acknowledged) {

base++;

}

}

}

// Receiver function

void receiver(Frame frames[], int total\_frames) {

for (int i = 0; i < total\_frames; i++) {

printf("Received frame %d: %c\n", frames[i].sequence\_number, frames[i].data);

}

}

int main() {

Frame frames[FRAME\_COUNT];

// Initialize frames with data and sequence numbers

for (int i = 0; i < FRAME\_COUNT; i++) {

frames[i].sequence\_number = i;

frames[i].is\_acknowledged = false;

frames[i].data = 'A' + i;

}

printf("Sender:\n");

sender(frames, FRAME\_COUNT);

printf("\nReceiver:\n");

receiver(frames, FRAME\_COUNT);

return 0;

}

Sender:

Sending frame 0: A

Sending frame 1: B

Sending frame 2: C

Sending frame 3: D

Enter the last acknowledged frame number (or -1 to exit): 2

Sending frame 3: D

Sending frame 4: E

Sending frame 5: F

Sending frame 6: G

Enter the last acknowledged frame number (or -1 to exit): 5

Sending frame 6: G

Sending frame 7: H

Enter the last acknowledged frame number (or -1 to exit): 7

Receiver:

Received frame 0: A

Received frame 1: B

Received frame 2: C

Received frame 3: D

Received frame 4: E

Received frame 5: F