Computer and Communication Engineering Program
Faculty of Engineering
Alexandria University

CSE 238 Microprocessors Systems

Project 2: Packet Transmission Control

Name	ID	Group	Section
Omar Ibrahim Elsayed Maarouf	7442	2	1

Requirement

It is required to implement a program that accepts from the user size of the file to be transmitted (number of packets forming the file) and returns the value corresponding to the number of transmissions done to transfer the file. The maximum capacity of the network is to send 128 packets at a time following the illustrated rules:

- The first transmission consists of 1 packet only.
- If the number of packets in the previous transmission is smaller than 64 packets, then the next transmission will have the double of this number of packets.
- If the number of packets in the previous transmission is greater than or equal to 64 packets, then the next transmission will have 1 more packets.

In order to illustrate the previous rules, this example shows the expected size of each transmission as well as the number of transmissions.

- It is asked to transfer 198 packets:

Transmission Index	Size of Transmission	Total Number of Transmitted Packets
1	1	1
2	2	3
3	4	7
4	8	15
5	16	31
6	32	63
7	64	127
8	65	192
9	66	198 (some packets are not used)

The total number of transmissions = 9

Source Code

```
include "emu8086.inc"

data segment
    p dw 0
    string1 dw "Enter number of pockets to be transmitted: "
    string2 dw "Number of transmissions: "
data ends

code segment
start:
    mov cx,data
    mov ds,cx
    define_scan_num
    define_print_string
    define_print_num
    define_print_num_uns
    define_clear_screen
    lea si,string1
    call print_string
    call scan_num
    mov p,cx
    mov dh,0
a0:
    mov ax,1
x1:
    inc dh
    sub p,ax
    js ex
    cmp ax,64
    jnb x2
    mov cl,2
    mul cl
    jmp x0
x2:
    inc ax
x0:
    cmp p,0
    jbe ex
    cmp ax,128
    jbe x1
    jmp a0
ex:
    print 0AH
    print 0DH
    lea si,string2
    call print_string
    mov al,dh
    mov ah,0
```

```
    call print_num_uns
code ends

end start

ret
```

The previous assembly code prints the message “Enter number of packets to be transmitted: “, and waits until the user inputs a response, then it processes this number in a group of loops and finally prints the message “Number of transmissions: “, as well as printing the number of transmissions calculated.

Test Runs

Fig. 01: Output of input 35

Fig. 02: Output of input 127

Fig. 03: Output of input 198

Fig. 04: Output of input 510

Fig. 05: Output of input 6303

Fig. 06: Output of input 6304

Fig. 07: Output of input 6305

Fig. 08: Output of input 6307