

Assignment 2

(CS 348)

Write a C program that implements a 2 pass Assembler with the instruction set as follows:

ADD, SUB, MUL, DIV, COMP, JMP, JLE, JE, JGE, JNE, JL, JG, MOV, RESW,
RESB, BYTE, WORD, CALL, RET, PUSH, POP, LDA, LDX, LDA, LDX, LDL,
STA, STX, STL, LDCH, STCH, TD, RD, WD.

| Line | Loc | Source statement | Object code |
|------|------|--|-------------|
| 5 | 1000 | COPY START 1000 | |
| 10 | 1000 | FIRST STL RETADR | 141033 |
| 15 | 1003 | CLOOP JSUB RDREC | 482039 |
| 20 | 1006 | LDA LENGTH | 001036 |
| 25 | 1009 | COMP ZERO | 281030 |
| 30 | 100C | JEQ ENDFIL | 301015 |
| 35 | 100F | JSUB WRREC | 482061 |
| 40 | 1012 | J CLOOP | 3C1003 |
| 45 | 1015 | ENDFIL LDA EOF | 00102A |
| 50 | 1018 | STA BUFFER | 0C1039 |
| 55 | 101B | LDA THREE | 00102D |
| 60 | 101E | STA LENGTH | 0C1036 |
| 65 | 1021 | JSUB WRREC | 482061 |
| 70 | 1024 | LDL RETADR | 081033 |
| 75 | 1027 | RSUB | 4C0000 |
| 80 | 102A | EOF BYTE C'EOF' | 454F46 |
| 85 | 102D | THREE WORD 3 | 000003 |
| 90 | 1030 | ZERO WORD 0 | 000000 |
| 95 | 1033 | RETADR RESW 1 | |
| 100 | 1036 | LENGTH RESW 1 | |
| 105 | 1039 | BUFFER RESB 4096 | |
| 110 | | . | |
| 115 | | . SUBROUTINE TO READ RECORD INTO BUFFER | |
| 120 | | . | |
| 125 | 2039 | RDREC LDX ZERO | 041030 |
| 130 | 203C | LDA ZERO | 001030 |
| 135 | 203F | RLOOP TD INPUT | E0205D |
| 140 | 2042 | JEQ RLOOP | 30203F |
| 145 | 2045 | RD INPUT | D8205D |
| 150 | 2048 | COMP ZERO | 281030 |
| 155 | 204B | JEQ EXIT | 302057 |
| 160 | 204E | STCH BUFFER,X | 549039 |
| 165 | 2051 | TIX MAXLEN | 2C205E |
| 170 | 2054 | JLT RLOOP | 38203F |
| 175 | 2057 | EXIT STX LENGTH | 101036 |
| 180 | 205A | RSUB | 4C0000 |
| 185 | 205D | INPUT BYTE X'F1' | F1 |
| 190 | 205E | MAXLEN WORD 4096 | 001000 |
| 195 | | . | |
| 200 | | . SUBROUTINE TO WRITE RECORD FROM BUFFER | |
| 205 | | . | |
| 210 | 2061 | WRREC LDX ZERO | 041030 |
| 215 | 2064 | WLOOP TD OUTPUT | E02079 |
| 220 | 2067 | JEQ WLOOP | 302064 |
| 225 | 206A | LDCH BUFFER,X | 509039 |
| 230 | 206D | WD OUTPUT | DC2079 |
| 235 | 2070 | TIX LENGTH | 2C1036 |
| 240 | 2073 | JLT WLOOP | 382064 |
| 245 | 2076 | RSUB | 4C0000 |
| 250 | 2079 | OUTPUT BYTE X'05' | 05 |
| 255 | | END FIRST | |

This is the sample Input Assembly Language Program.

This is the object code corresponding to the above Assembly Language Program.

```
HCOPY 00100000107A
T0010001E1410334820390010362810303010154820613C100300102A0C103900102D
T00101E150C10364820610810334C0000454F46000003000000
T0020391E041030001030E0205D30203FD8205D2810303020575490392C205E38203F
T0020571C1010364C0000F1001000041030E02079302064509039DC20792C1036
T002073073820644C000005
E001000
```