# Exercise 4 Answers

1.

* 1. 18 0B 2D 15 00
  2. 18 09 0A 20 00
  3. 18 02 05 56
  4. B7 06
  5. B7 47
  6. B7 50
  7. B7 81
  8. B7 D1
  9. B7 C7
  10. B7 E0

2.

Addr Contents Source

lowbits equ %00000111

org 3000h

3000 05 1F 02 26 data dc.b 05h,1Fh,02h,26h

org 3100h

3100 07 digit dc.b 7h

3101 03 length dc.b 3h

3102 count ds.b 1

3103 3000 array dc.w data

org C000h

C000 FE 3103 ldx array

C003 79 3102 clr count

C006 B6 3101 ldaa length

C009 27 10 loop beq finish

C00B E6 00 ldab 0,x

C00D C4 07 andb #lowbits

C00F F1 3100 cmpb digit

C012 26 03 bne skip

C014 72 3102 inc count

C017 08 skip inx

C018 43 deca

C019 20 EE bra loop

C01B 3F finish swi

Symbols:

array \*00003103

count \*00003102

data \*00003000

digit \*00003100

finish \*0000c01b

length \*00003101

loop \*0000c009

lowbits \*00000007

skip \*0000c017

3.

limit equ 70

org 2000

07D0 length ds.b 2

07D2 3200 grades dc.w $3200

07D4 count ds.b 1

org C000h

C000 FE 07D2 ldx grades

C003 79 07D4 clr count

C006 C6 46 ldab #limit

C008 FD 07D0 ldy length

C00B 27 0D again beq done

C00D A6 00 ldaa 0,x

C00F 1817 cba

C011 24 03 bhs skip

C013 72 07D4 inc count

C016 08 skip inx

C017 03 dey

C018 20 F1 bra again

C01A 3F done swi

Symbols

again \*0000c00b

count \*000007d4

done \*0000c01a

grades \*000007d2

length \*000007d0

limit \*00000046

skip \*0000c016

4.

Addr Contents Source

org 1000h

1000 3000 string dc.w 3000h

1002 array ds.w 1

1004 00C8 arrlen dc.w 0200

1006 endarr ds.w 1

1008 found ds.w 1

org C000h

C000 FC 1002 ldd array

C003 F3 1004 addd arrlen

C006 83 0002 subd #2

C009 7C 1006 std endarr

C00C FE 1000 ldx string

C00F FD 1002 ldy array

C012 BD 1006 loop cpy endarr

C015 27 1D beq done

C017 A6 40 ldaa 0,y

C019 A1 00 cmpa 0,x

C01B 26 14 bne next

C01D A6 41 ldaa 1,y

C01F A1 01 cmpa 1,x

C021 26 0E bne next

C023 A6 42 ldaa 2,y

C025 A1 02 cmpa 2,x

C027 26 08 bne next

C029 7D 1008 sty found

C02C FD 1006 ldy endarr

C02F 20 E1 bra loop

C031 02 next iny

C032 20 DE bra loop

C034 3F done swi

Symbols:

array \*00001002

arrlen \*00001004

done \*0000C034

endarr \*00001006

found \*00001008

loop \*0000C012

next \*0000C031

string \*00001000