**Sample Programs**

* Data movement operations

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| **SIC** | **SIC/XE** |
| LDA MSTA NLDCH PSTCH Q1. WORD 5
2. RESW 1
3. BYTE C’Z’
4. RESB 1
 | LDA #5STA NLDA #90STCH QN RESW 1Q RESB 1 |

* Write a program to compute the following
* BETA = (ALPHA+INCR -1)
* DELTA = (GAMMA + INCR - 1)

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| **SIC** | **SIC/XE** |
| LDA ALPHAADD INCRSUB ONESTA BETALDA GAMMAADD INCRSUB ONESTA DELTAALPHA WORD 5GAMMA WORD 8INCR WORD 6ONE WORD 1BETA RESW 1DELTA RESW 1 | LDS INCRLDA ALPHAADDR S,ASUB #1STA BETALDA GAMMAADDR S,ASUB #1STA DELTAALPHA WORD 5GAMMA WORD 8INRC WORD 6BETA RESW 1DELTA RESW 1 |

* Write a program to copies 11 bit character string from one string to another

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| **SIC** | **SIC/XE** |
| LDX ZEROJ1 LDCH STR1,X STCH STR2,XTIX ELEVENJLT J1ZERO WORD 0ELEVEN WORD 11STR1 BYTE C’TEST STRING’ STR2 RESB 11 | LDT #11LDX #0J1 LDCH STR1,X STCH STR2,XTIXR TJLT J1STR1 BYTE C’TEST STRING’ STR2 RESB 11 |

* Write a program to do the following
	+ Gamma[] = Alpha[] + Beta[]

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| **SIC** | **SIC/XE** |
| LDA ZEROSTA INDEXLOOP LDX INDEXLDA ALPHA,XADD BETA,XSTA GAMMA,XLDA INDEXADD THREESTA INDEXCOMP K300JLT LOOPZERO WORD 0THREE WORD 3K300 WORD 300INDEX RESW 1ALPHA RESW 100BETA RESW 100GAMMA RESW 100 | LDS #3LDT #300LDX #0LOOP LDA ALPHA,XADD BETA,XSTA GAMMA,XADDR S,XCOMPR X,TJLT LOOPALPHA RESW 100BETA RESW 100GAMMA RESW 100 |

Write SIC and SIC/XE program to calculate ALPHA = BETA x GAMMA.

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| **SIC** | **SIC/XE** |
|  LDA BETA MUL GAMMA STA ALPHAALPHA RESW 1BETA  WORD  10GAMMA WORD 20 |  LDA BETA LDS GAMMA MULR S,A  STA ALPHAALPHA RESW 1BETA  WORD  10GAMMA WORD 20 |

Write SIC and SIC/XE program to set ALPHA = 4\*BETA–9.

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| **SIC** | **SIC/XE** |
|  LDA BETA MUL FOUR SUB NINE STA ALPHAALPHA RESW 1 BETA WORD 10 FOUR WORD 4 NINE WORD 9 |  LDA BETA LDS #4 MULR S,A SUB #9 STA ALPHAALPHA RESW 1BETA WORD 10 |

Write SIC and SIC/XE program to swap the values of ALPHA and BETA.

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| **SIC** | **SIC/XE** |
|  LDA ALPHA STA GAMMA LDA BETA STA ALPHA LDA GAMMA STA BETAALPHA WORD 10BETA  WORD 20GAMMA RESW 1 |  LDA ALPHA LDS BETA STA BETA STS ALPHAALPHA WORD 10BETA  WORD 20 |

Write SIC and SIC/XE program to set ALPHA = integer portion of (BETA ÷ GAMMA)

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| **SIC** | **SIC/XE** |
|  LDA BETA DIV GAMMA STA ALPHAALPHA RESW 1BETA  WORD  20GAMMA WORD 15 |  LDA BETA LDS GAMMA DIVR S,A STA ALPHAALPHA RESW 1BETA  RESW  20GAMMA RESW 15 |

Write SIC and SIC/XE program to set ALPHA= integer portion of (BETA /GAMMA) and DELTA=remainder of(BETA /GAMMA).

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| **SIC** | **SIC/XE** |
| LDA BETADIV GAMMASTA ALPHALDA GAMMAMUL ALPHASTA TEMPLDA BETASUB TEMPSTA DELTABETA  WORD  20GAMMA WORD  7ALPHA RESW 1 DELTA RESW 1TEMP RESW 1 | LDA BETALDS GAMMADIVR  S, ASTA ALPHAMULR S, ALDS BETASUBR A, SSTS DELTABETA  WORD  20GAMMA WORD  7ALPHA RESW 1 DELTA RESW 1  |

Write a sequence of instructions for SIC/XE to set ALPHA= nearest integer of (BETA/GAMMA). Use reg F for calculation.

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| **SIC/XE** |
| LDF BETADIVF GAMMAFIXSTA ALPHAALPHA RESW 1BETA  WORD  20GAMMA WORD 7  |

Write SIC and SIC/XE program to clear a 20-byte string to all blanks

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| **SIC**  | **SIC/XE** |
| LDX ZERO LDCH BLANKLOOP STCH STR1,XTIX TWENTYJLT LOOPSTR1  RESB  20BLANK BYTE C ‘’ZERO WORD 0TWENTY WORD 20 | LDX #0LDS #20 LDCH #0LOOP STCH STR1,XTIXR SJLT LOOPSTR1  RESB  20  |

Suppose that ALPHA is an array of 100 words. Write SIC and SIC/XE program to set all 100 elements of the array to 0.

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| **SIC**  | **SIC/XE** |
| LDA ZEROSTA INDEXLOOP  LDX  INDEXLDA ZEROSTA  ALPHA, XLDA INDEX ADD  THREESTA INDEXCOMP K300JLT LOOPINDEX RESW 1ALPHA RESW 100ZERO WORD 0K300  WORD  300THREE WORD 3 | LDS #3LDT #300LDX #0LOOP LDA #0STA  ALPHA, X ADDR  S, XCOMPR X, TJLT LOOPALPHA RESW 100 |

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Suppose that ALPHA and BETA are the two arrays of 100 words. Another array of GAMMA elements are obtained by multiplying the corresponding ALPHA element by 4 and adding the corresponding BETA elements. Write SIC and SIC\XE program.

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| **SIC**  | **SIC/XE** |
| LOOP LDX INDEX  LDA ALPHA, XMUL FOUR ADD  BETA, XSTA  GAMMA, X LDA INDEXADD THREESTA INDEXCOMP K300JLT LOOPALPHA RESW 100BETA  RESW  100GAMMA RESW 100FOUR WORD 4THREE WORD 3K300 WORD 300INDEX WORD 0 | LDS #3LDT #300LDX #0 LOOP LDA ALPHA, XMUL #4 ADD  BETA, XSTA  GAMMA, X ADDR  S, XCOMPR X, TJLT LOOPALPHA RESW 100BETA  RESW  100GAMMA RESW 100 |

Suppose that ALPHA is an array of 100 words. Write SIC and SIC/XE program to find the maximum element in the array and store results in MAX

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| **SIC**  | **SIC/XE** |
|  LDA ZERO STA INDEXLOOP1 LDX INDEX LDA ALPHA, XCOMP MAXJLT LOOP2STA MAXLOOP2 LDA INDEX ADD THREE STA INDEXCOMP K300JLT LOOP1ZERO WORD 0ALPHA RESW 100K300 WORD 300INDEX WORD 0THREE WORD 3 MAX WORD -32768 | LDS #3LDT #300LDX #0LOOP1 LDA ALPHA, XCOMP MAXJLT LOOP2STA MAXLOOP2 ADDR S, XCOMPR X, TJLT LOOP1ALPHA RESW 100MAX WORD -32768 |

Suppose that RECORD contains a 100-byte record. Write SIC and SIC/XE program to write this record on to device 05.

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| **SIC**  | **SIC/XE** |
| JSUB WRRECWRREC LDX ZEROLOOP TD OUTPUTJEQ LOOPLDCH  RECORD, XWD OUTPUTTIX LENGTHJLT LOOPRSUBZERO WORD 0LENGTH WORD 100OUTPUT BYTE X,’05’RECORD RESB 100 | JSUB WRRECWRREC LDX #0LDT #100LOOP TD OUTPUTJEQ LOOPLDCH  RECORD, XWD OUTPUTTIXR TJLT LOOPRSUBOUTPUT BYTE X ,’05’RECORD RESB 100 |

Write a subroutine for SIC and SIC/XE that will read a record into a buffer. The record may be any length from 1 to 100 bytes. The end of record is marked with a “null” character (ASCII code 00). The subroutine should place the length of the record read into a variable named LENGTH

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| **SIC**  | **SIC/XE** |
| JSUB RDREC . .RDREC LDX ZEROLOOP TD INDEVJEQ LOOPRD INDEVCOMP NULLJEQ EXITSTCH  BUFFER, XTIX K100JLT RLOOPEXIT  STX  LENGTHRSUBZERO WORD 0NULL  WORD  0K100  WORD  100INDEV BYTE X ,’F1’LENGTH RESW 1BUFFER RESB 100 | JSUB RDREC . .RDREC  LDX   #0LDT #100LDS #0LOOP TD INDEVJEQ LOOPRD INDEVCOMPR A, SJEQ EXITSTCH  BUFFER, XTIXR TJLT RLOOPEXIT STX LENGTHRSUBINDEV BYTE X,’F1’LENGTH RESW 1BUFFER RESB 100 |

* Sample input and output operations

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| **SIC, SIC/XE** |
| LOOP1 TD INDEVJEQ LOOP1RD INDEV STCH DATALOOP2 TD OUTDEVJEQ LOOP2 LDCH DATA WD OUTDEVINDEV BYTE X’F1’ OUTDEV BYTE X’05’DATA RESB 1 |

* Write a SIC program to Read 100 byte record into buffer using subroutine

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| **SIC** | **SIC/XE** |
| JSUB READREAD LDX ZERO LOOP1 TD INDEVJEQ LOOP1RD INDEV STCH RECORD,X TIX K100JLT LOOP1 RSUBINDEV BYTE X’F1’ RECORD RESB 100ZERO WORD 0K300 WORD 300 | JSUB READREAD LDX #0LDT #100 LOOP1 TD INDEVJEQ LOOP1RD INDEV STCH RECORD,X TIXR TJLT LOOP1 RSUBINDEV BYTE X’F1’ RECORD RESB 100 |