ECE 441

Microprocessors

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Final Project Report:

**MONITOR PROJECT**

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Acknowledgment: I acknowledge all the work including figures and codes belongs to me and/or persons who are referenced.

Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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***Abstract***

The summary of your design should go here. Someone who reads this abstract should have a clear understanding of your design and the overall flow of the report.

# *1-) Introduction*

This will be an introduction to your design. You can give design objectives, a clear description of the problem and design methodology and technology used. Any figures and tables should have clear descriptions.



*Figure 1.1. Monitor command interpreter block diagram*

***2-) Monitor Program***

A clear description of your design should be given here - what this program will do, requirements, etc. You may include a block diagram or table.



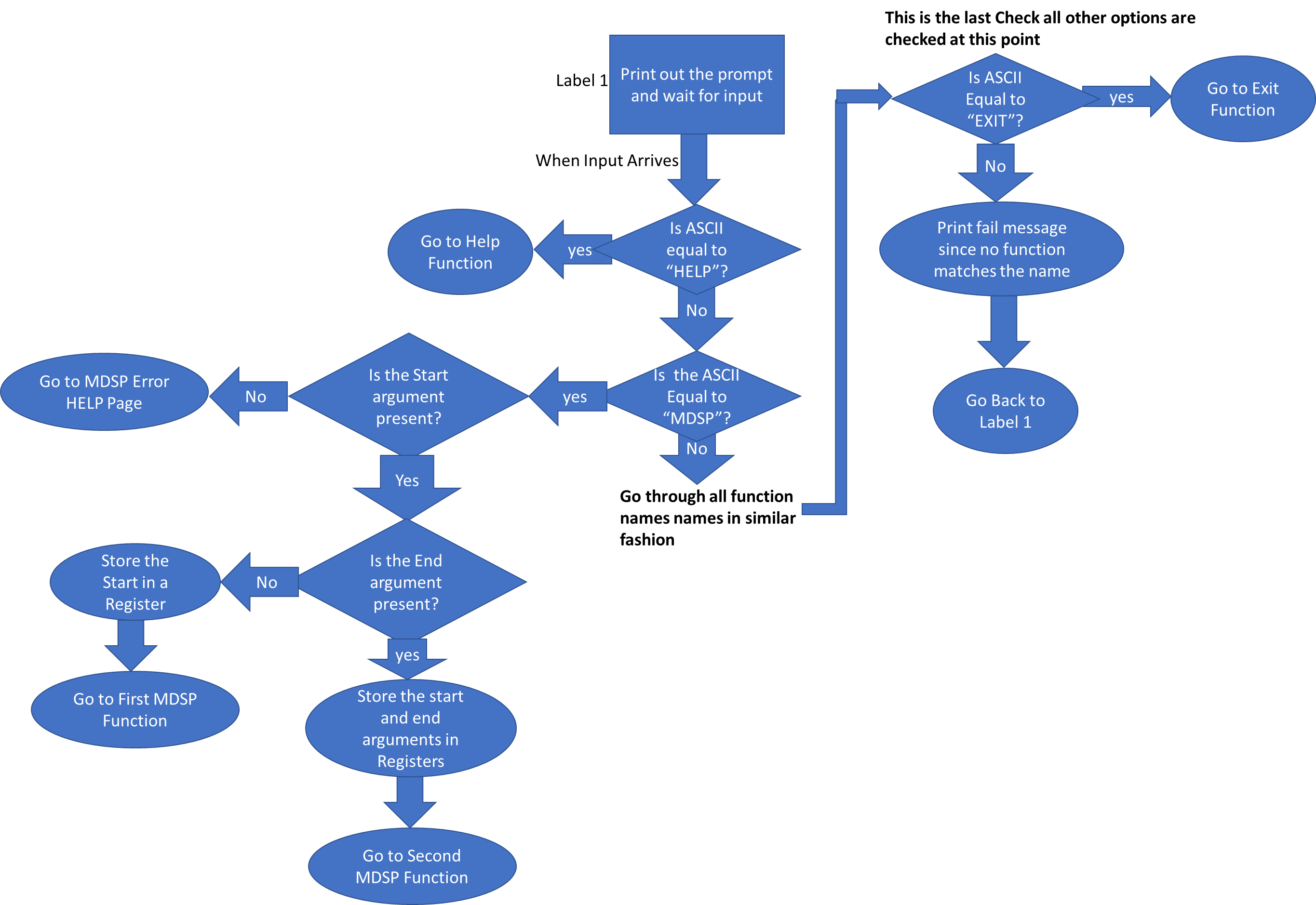
*Figure 2.1. Monitor program*

***2.1-) Command Interpreter***

A clear description of your design should be given here.

***2.1.1-) Flowchart***

Overall Command Interpreter Flowchart.



yes

No

yes

No

Is ASCII equal to “HELP”?

Print out the prompt and wait for input

When Input Arrives

Is the ASCII Equal to “MDSP”?

yes

Yes

Is the End argument present?

No

yes

**Go through all function names names in similar fashion**

Is ASCII Equal to “EXIT”?

No

**This is the last Check all other options are checked at this point**

Label 1

Example flowchart with no arguments (Help)

Example Flowchart with Arguments (Sort)

***2.1.2-) Command Interpreter Assembly Code***

pSTART

MOVEM.L A0-A6/D0-D7,-(SP)

MOVEA.L #PROMPT,A1

MOVE.B #14,D0

TRAP #15

LEA $4000,A1

MOVE.B #2,D0

TRAP #15

\*COMPARING INPUT TO THE MENU ITEMS\*

MOVE.L #HELPPROMPT,A0

CLR.L D3 ;COUNTER FOR REVERSING A1 TO USER INPUT

COMPAREHELP

ADD.L #1,D3

CMPM.B (A0)+,(A1)+

BNE COMPAREMDSP

CMPI.B #00,-1(A0) ;CHECK IF THE BYTE JUST COMPARED WAS NULL TERMINATOR

BNE COMPAREHELP

BSR HELPFUNCTION

COMPAREMDSP

SUB.L D3,A1

CLR.L D3

MOVE.L #MDSPPROMPT,A0

COMPAREMDSP2

ADD.L #1,D3

CMPM.B (A0)+,(A1)+

BNE COMPARESORTW

CMPI.B #32,-1(A0) ;COMPARING LAST PART TO SPACE TO SEE IF THE STRING ENDS WITH A SPACE

BNE COMPAREMDSP2

;CHECK FOR THE ARGUMENTS

CLR.L D4 ;FIRST ARG

CLR.L D5 ;SECOND ARG

CMPMDSPL1

ADD.B (A1)+,D4 ; MOVE THE MEMORY LOCATION NUMBER TO D4

CMPI.B #0,(A1) ;COMPARING LAST PART TO EMPTY STRNG

BEQ MDSPFUNCTION1 ;FUNCTION FOR 1 ARG

CMPI.B #32,(A1) ;COMPARING LAST PART TO SPACE

BEQ CMPMDSPL2

LSL.L #8,D4

BSR CMPMDSPL1

CMPMDSPL2

ADD.B (A1)+,D5 ; MOVE THE SECOND MEMORY LOCATION NUMBER TO D5

CMPI.B #0,(A1) ;COMPARING LAST PART TO EMPTY STRNG

BEQ MDSPFUNCTION2 ;FUNCTION FOR 2 ARG

LSL.L #8,D5

BSR CMPMDSPL2

COMPARESORTW ;3 arguments, d4 is start,d5 is end, d6 is the ascending or descending

SUB.L D3,A1

CLR.L D3

MOVE.L #SORTWPROMPT,A0

COMPARESORTW2

ADD.L #1,D3

CMPM.B (A0)+,(A1)+

BNE COMPAREMM

CMPI.B #32,-1(A0) ;COMPARING LAST PART TO SPACE TO SEE IF THE STRING ENDS WITH A SPACE

BNE COMPARESORTW2

;CHECK FOR THE ARGUMENTS

CLR.L D4 ;FIRST ARG

CLR.L D5 ;SECOND ARG

CLR.L D6 ;THIRD ARG

CMPSORTWL1

ADD.B (A1)+,D4 ; MOVE THE MEMORY LOCATION NUMBER TO D4

CMPI.B #0,(A1) ;COMPARING LAST PART TO EMPTY STRNG

BEQ SORTWHELP ;FAILS IF NO MEM IS GIVEN

CMPI.B #32,(A1) ;COMPARING LAST PART TO SPACE

BEQ CMPSORTWL2

LSL.L #8,D4

BRA CMPSORTWL1

CMPSORTWL2

ADD.B (A1)+,D5 ; MOVE THE MEMORY LOCATION NUMBER TO D5

CMPI.B #0,(A1) ;COMPARING LAST PART TO EMPTY STRNG

BEQ SORTWHELP ;FAILS IF NO MEM IS GIVEN

CMPI.B #32,(A1) ;COMPARING LAST PART TO SPACE

BEQ CMPSORTWL3

LSL.L #8,D5

BRA CMPSORTWL2

CMPSORTWL3

ADD.B 1(A1),D6 ; MOVE THE SECOND MEMORY LOCATION AFTER SPACE TO D5

CMP.B #'A',D6 ;COMPARING LAST PART TO a or l

BEQ SORTWFUNCTION

;FUNCTION

CMP.B #'D',D6

BEQ SORTWFUNCTION ;FUNCTION

;D4 GIVES THE ADDRESS D5 GIVES THE MODE

BRA SORTWHELP ;IF END IS NOT EQUAL FAIL AND EXIT

COMPAREMM

SUB.L D3,A1

CLR.L D3

MOVE.L #MMPROMPT,A0

COMPAREMM2

ADD.L #1,D3

CMPM.B (A0)+,(A1)+

BNE COMPAREMS

CMPI.B #32,-1(A0) ;COMPARING LAST PART TO SPACE TO SEE IF THE STRING ENDS WITH A SPACE

BNE COMPAREMM2

;CHECK FOR THE ARGUMENTS

CLR.L D4 ;FIRST ARG

CLR.L D5 ;SECOND ARG

CMPMML1

ADD.B (A1)+,D4 ; MOVE THE MEMORY LOCATION NUMBER TO D4

CMPI.B #0,(A1) ;COMPARING LAST PART TO EMPTY STRNG

BEQ MMHELP ;FAILS IF NO MEM IS GIVEN

CMPI.B #32,(A1) ;COMPARING LAST PART TO SPACE

BEQ CMPMML2

LSL.L #8,D4

BSR CMPMML1

CMPMML2

ADD.B 1(A1),D5 ; MOVE THE SECOND MEMORY LOCATION AFTER SPACE TO D5

CMP.B #'B',D5 ;COMPARING LAST PART TO B,W OR L

BEQ MMFUNCTION ;FUNCTION

CMP.B #'W',D5

BEQ MMFUNCTION ;FUNCTION

CMP.B #'L',D5

BEQ MMFUNCTION ;FUNCTION

;D4 GIVES THE ADDRESS D5 GIVES THE MODE

BRA MMHELP ;IF END IS NOT EQUAL FAIL AND EXIT

COMPAREMS ;SEND 3 ARGUMENTS, D4 IS MEMLOC, D5 IS DATA, D6 IS ASCII OR HEX

SUB.L D3,A1

CLR.L D3

MOVE.L #MSPROMPT,A0

COMPAREMS2

ADD.L #1,D3

CMPM.B (A0)+,(A1)+

BNE COMPAREBF

CMPI.B #32,-1(A0) ;COMPARING LAST PART TO SPACE TO SEE IF THE STRING ENDS WITH A SPACE

BNE COMPAREMS2

;CHECK FOR THE ARGUMENTS

CLR.L D4 ;FIRST ARG

CLR.L D5 ;SECOND ARG

CLR.L D6 ;THIRD ARG

CMPMSL1

ADD.B (A1)+,D4 ; MOVE THE MEMORY LOCATION NUMBER TO D4

CMPI.B #0,(A1) ;COMPARING LAST PART TO EMPTY STRNG

BEQ MSHELP ;FAILS IF NO MEM IS GIVEN

CMPI.B #32,(A1) ;COMPARING LAST PART TO SPACE

BEQ CMPMSL2

LSL.L #8,D4

BRA CMPMSL1

CMPMSL2

ADD.B (A1)+,D5 ; MOVE THE MEMORY LOCATION NUMBER TO D5

CMPI.B #0,(A1) ;COMPARING LAST PART TO EMPTY STRNG

BEQ MSHELP ;FAILS IF NO MEM IS GIVEN

CMPI.B #32,(A1) ;COMPARING LAST PART TO SPACE

BEQ CMPMSL3

LSL.L #8,D5

BRA CMPMSL2

CMPMSL3

ADD.B 1(A1),D6 ; MOVE THE SECOND MEMORY LOCATION AFTER SPACE TO D5

CMP.B #'H',D6 ;COMPARING LAST PART TO B,W OR L

BEQ MSFUNCTION ;FUNCTION

CMP.B #'A',D6

BEQ MSFUNCTION ;FUNCTION

;D4 GIVES THE ADDRESS D5 GIVES THE MODE

BRA MSHELP ;IF END IS NOT EQUAL FAIL AND EXIT

COMPAREBF ;D4 IS BEGGINING ADDRESS, D5 IS END ADDRESS, D6 IS THE WORD DATA TO BE STORED

SUB.L D3,A1

CLR.L D3

MOVE.L #BFPROMPT,A0

COMPAREBF2

ADD.L #1,D3

CMPM.B (A0)+,(A1)+

BNE COMPAREBMOV

CMPI.B #32,-1(A0) ;COMPARING LAST PART TO SPACE TO SEE IF THE STRING ENDS WITH A SPACE

BNE COMPAREBF2

;CHECK FOR THE ARGUMENTS

CLR.L D4 ;FIRST ARG

CLR.L D5 ;SECOND ARG

CLR.L D6 ;THIRD ARG

CMPBFL1

ADD.B (A1)+,D4 ; MOVE THE MEMORY LOCATION NUMBER TO D4

CMPI.B #0,(A1) ;COMPARING LAST PART TO EMPTY STRNG

BEQ BFHELP ;FAILS IF NO MEM IS GIVEN

CMPI.B #32,(A1) ;COMPARING LAST PART TO SPACE

BEQ CMPBFL2

LSL.L #8,D4

BRA CMPBFL1

CMPBFL2

ADD.B (A1)+,D5 ; MOVE THE MEMORY LOCATION NUMBER TO D5

CMPI.B #0,(A1) ;COMPARING LAST PART TO EMPTY STRNG

BEQ BFHELP ;FAILS IF NO MEM IS GIVEN

CMPI.B #32,(A1) ;COMPARING LAST PART TO SPACE

BEQ CMPBFL3

LSL.L #8,D5

BRA CMPBFL2

CMPBFL3

ADD.B (A1)+,D6 ; MOVE THE MEMORY LOCATION NUMBER TO D5

CMPI.B #0,(A1) ;COMPARING LAST PART TO EMPTY STRNG

BEQ BFFUNCTION ;FAILS IF NO MEM IS GIVEN

CMPI.B #32,(A1) ;COMPARING LAST PART TO SPACE

BEQ BFHELP

LSL.L #8,D6

BRA CMPBFL3

COMPAREBMOV ;D4 IS THE START OF MOV, D5 IS THE END OF MOV, D6 IS THE DESTINATION OF THE MOVE

SUB.L D3,A1

CLR.L D3

MOVE.L #BMOVPROMPT,A0

COMPAREBMOV2

ADD.L #1,D3

CMPM.B (A0)+,(A1)+

BNE COMPAREBTST

CMPI.B #32,-1(A0) ;COMPARING LAST PART TO SPACE TO SEE IF THE STRING ENDS WITH A SPACE

BNE COMPAREBMOV2

;CHECK FOR THE ARGUMENTS

CLR.L D4 ;FIRST ARG

CLR.L D5 ;SECOND ARG

CLR.L D6 ;THIRD ARG

CMPBMOVL1

ADD.B (A1)+,D4 ; MOVE THE MEMORY LOCATION NUMBER TO D4

CMPI.B #0,(A1) ;COMPARING LAST PART TO EMPTY STRNG

BEQ BMOVHELP ;FAILS IF NO MEM IS GIVEN

CMPI.B #32,(A1) ;COMPARING LAST PART TO SPACE

BEQ CMPBMOVL2

LSL.L #8,D4

BRA CMPBMOVL1

CMPBMOVL2

ADD.B (A1)+,D5 ; MOVE THE MEMORY LOCATION NUMBER TO D5

CMPI.B #0,(A1) ;COMPARING LAST PART TO EMPTY STRNG

BEQ BMOVHELP ;FAILS IF NO MEM IS GIVEN

CMPI.B #32,(A1) ;COMPARING LAST PART TO SPACE

BEQ CMPBMOVL3

LSL.L #8,D5

BRA CMPBMOVL2

CMPBMOVL3

ADD.B (A1)+,D6 ; MOVE THE MEMORY LOCATION NUMBER TO D5

CMPI.B #0,(A1) ;COMPARING LAST PART TO EMPTY STRNG

BEQ BMOVFUNCTION

;FAILS IF NO MEM IS GIVEN

CMPI.B #32,(A1) ;COMPARING LAST PART TO SPACE

BEQ BMOVHELP

LSL.L #8,D6

BRA CMPBMOVL3

COMPAREBTST ;D4 IS START D5 IS END

SUB.L D3,A1

CLR.L D3

MOVE.L #BTSTPROMPT,A0

COMPAREBTST2

ADD.L #1,D3

CMPM.B (A0)+,(A1)+

BNE COMPAREBSCH

CMPI.B #32,-1(A0) ;COMPARING LAST PART TO SPACE TO SEE IF THE STRING ENDS WITH A SPACE

BNE COMPAREBTST2

;CHECK FOR THE ARGUMENTS

CLR.L D4 ;FIRST ARG

CLR.L D5 ;SECOND ARG

CMPBTSTL1

ADD.B (A1)+,D4 ; MOVE THE START MEMORY LOCATION NUMBER TO D4

CMPI.B #0,(A1) ;COMPARING LAST PART TO EMPTY STRNG

BEQ BTSTHELP ;FAILS IF NO MEM IS GIVEN

CMPI.B #32,(A1) ;COMPARING LAST PART TO SPACE

BEQ CMPBTSTL2

LSL.L #8,D4

BRA CMPBTSTL1

CMPBTSTL2

ADD.B (A1)+,D5 ; MOVE THE MEMORY LOCATION NUMBER TO D5

CMPI.B #0,(A1) ;COMPARING LAST PART TO EMPTY STRNG

BEQ BTSTFUNCTION ;FAILS IF NO MEM IS GIVEN

CMPI.B #32,(A1) ;COMPARING LAST PART TO SPACE

BEQ BTSTHELP

LSL.L #8,D5

BRA CMPBTSTL2

COMPAREBSCH ;D4 GIVES START ADDRESS, D5 GIVES END ADDRESS, D6 GIVES THE WORD BEING SEARCHED

SUB.L D3,A1

CLR.L D3

MOVE.L #BSCHPROMPT,A0

COMPAREBSCH2

ADD.L #1,D3

CMPM.B (A0)+,(A1)+

BNE COMPAREGO

CMPI.B #32,-1(A0) ;COMPARING LAST PART TO SPACE TO SEE IF THE STRING ENDS WITH A SPACE

BNE COMPAREBSCH2

;CHECK FOR THE ARGUMENTS

CLR.L D4 ;FIRST ARG

CLR.L D5 ;SECOND ARG

CLR.L D6 ;THIRD ARG

CMPBSCHL1

ADD.B (A1)+,D4 ; MOVE THE START MEMORY LOCATION NUMBER TO D4

CMPI.B #0,(A1) ;COMPARING LAST PART TO EMPTY STRNG

BEQ BSCHHELP ;FAILS IF NO MEM IS GIVEN

CMPI.B #32,(A1) ;COMPARING LAST PART TO SPACE

BEQ CMPBSCHL2

LSL.L #8,D4

BRA CMPBSCHL1

CMPBSCHL2

ADD.B (A1)+,D5 ; MOVE THE MEMORY LOCATION NUMBER TO D5

CMPI.B #0,(A1) ;COMPARING LAST PART TO EMPTY STRNG

BEQ BSCHHELP ;FAILS IF NO MEM IS GIVEN

CMPI.B #32,(A1) ;COMPARING LAST PART TO SPACE

BEQ CMPBSCHL3

LSL.L #8,D5

BRA CMPBSCHL2

CMPBSCHL3

ADD.B (A1)+,D6 ; MOVE THE MEMORY LOCATION NUMBER TO D5

CMPI.B #0,(A1) ;COMPARING LAST PART TO EMPTY STRNG

BEQ BSCHFUNCTION

;FAILS IF NO MEM IS GIVEN

CMPI.B #32,(A1) ;COMPARING LAST PART TO SPACE

BEQ BSCHHELP

LSL.L #8,D6

BRA CMPBSCHL3

COMPAREGO ;D4 IS THE ARGUMENT TO GET TO THE MEMLOC

SUB.L D3,A1

CLR.L D3

MOVE.L #GOPROMPT,A0

COMPAREGO2

ADD.L #1,D3

CMPM.B (A0)+,(A1)+

BNE COMPAREDF

CMPI.B #32,-1(A0) ;COMPARING LAST PART TO SPACE TO SEE IF THE STRING ENDS WITH A SPACE

BNE COMPAREGO2

;CHECK FOR THE ARGUMENTS

CLR.L D4 ;FIRST ARG

CLR.L D5 ;SECOND ARG

CLR.L D6 ;THIRD ARG

CMPGOL1

ADD.B (A1)+,D4 ; MOVE THE START MEMORY LOCATION NUMBER TO D4

CMPI.B #0,(A1) ;COMPARING LAST PART TO EMPTY STRNG

BEQ GOFUNCTION ;FAILS IF NO MEM IS GIVEN

CMPI.B #32,(A1) ;COMPARING LAST PART TO SPACE

BEQ GOHELP

LSL.L #8,D4

BRA CMPGOL1

COMPAREDF

SUB.L D3,A1

CLR.L D3

MOVE.L #DFPROMPT,A0

COMPAREDF2

ADD.L #1,D3

CMPM.B (A0)+,(A1)+

BNE COMPAREEXIT

CMPI.B #0,-1(A0)

BNE COMPAREDF2

BSR DFFUNCTION

COMPAREEXIT

SUB.L D3,A1

CLR.L D3

MOVE.L #EXITPROMPT,A0

COMPAREEXIT2

ADD.L #1,D3

CMPM.B (A0)+,(A1)+

BNE FAIL

CMPI.B #0,-1(A0)

BNE COMPAREEXIT2

BSR EXITFUNCTION

***2.2-) Debugger Commands***

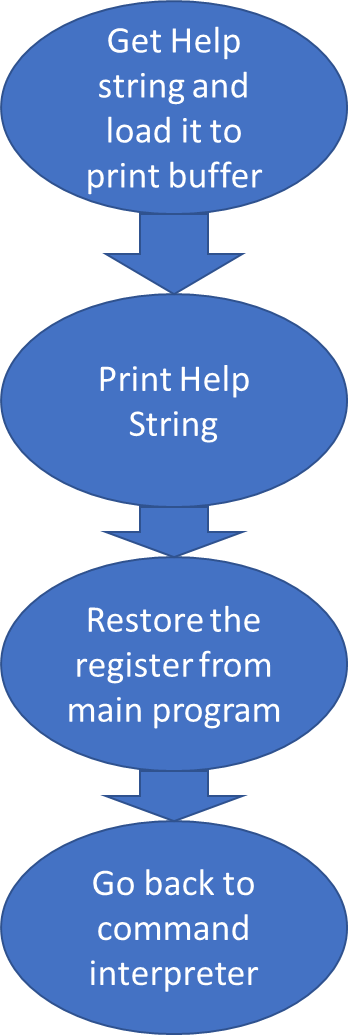
A clear description of your design should be given here.

***2.2.1-) Help***

A clear description of this debugger command should be given here.

***2.2.1.1-) Help Flowchart***

An algorithm of the design and its flowchart will be explained here. You may need to include comments for your algorithm.



***2.2.1.2-) Help Assembly Code***

The assembly code should be written using the algorithm above.

HELPFUNCTION ;prints out the help statement stored in memory

MOVEA.L #HELP,A1

MOVE.B #13,D0

TRAP #15

MOVEM.L (SP)+, A0-A6/D0-D7

BRA pSTART

*Figure 2.7. Help Assembly Code*

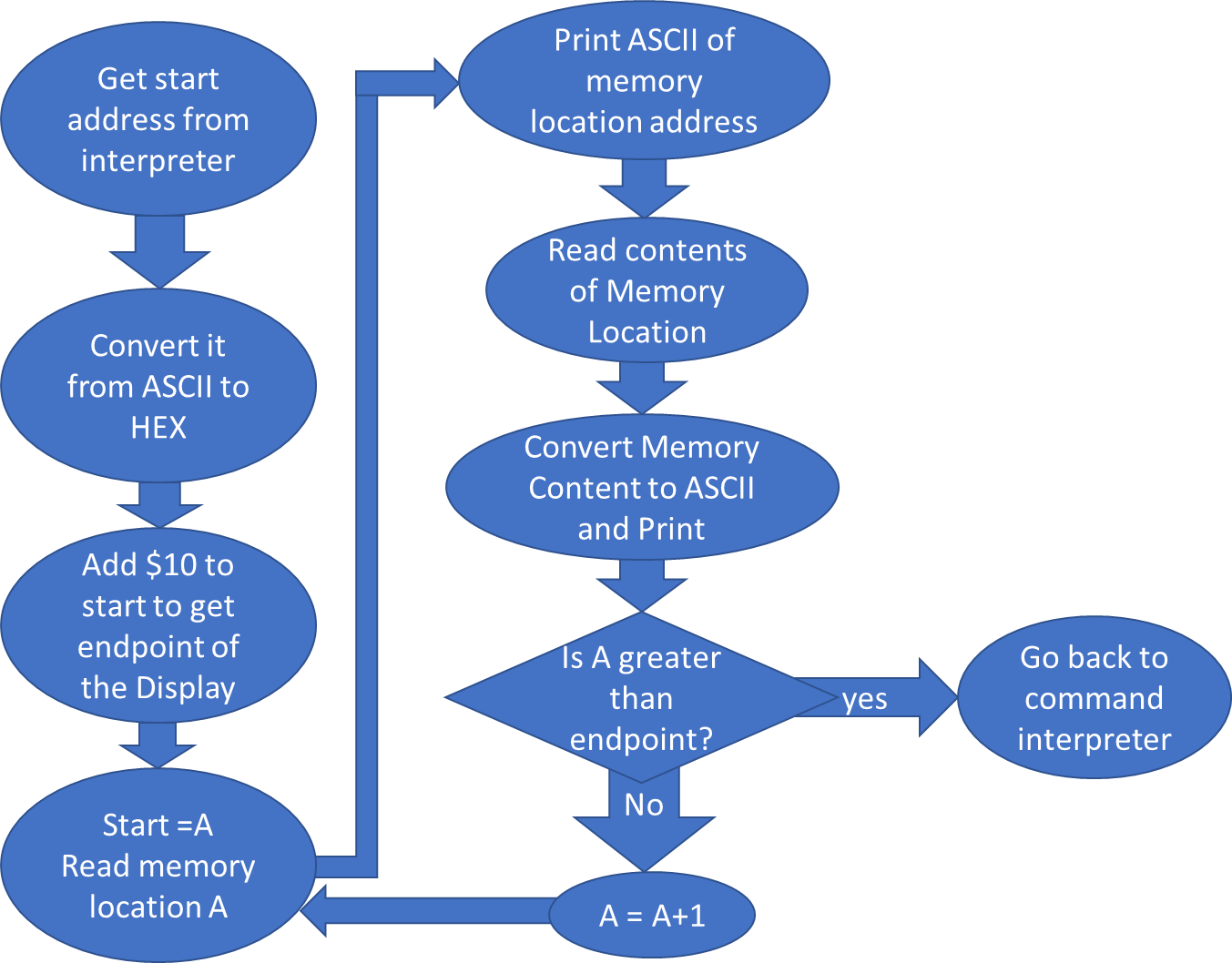
***2.2.2-) Memory Display***

It is similar to 2.2.1

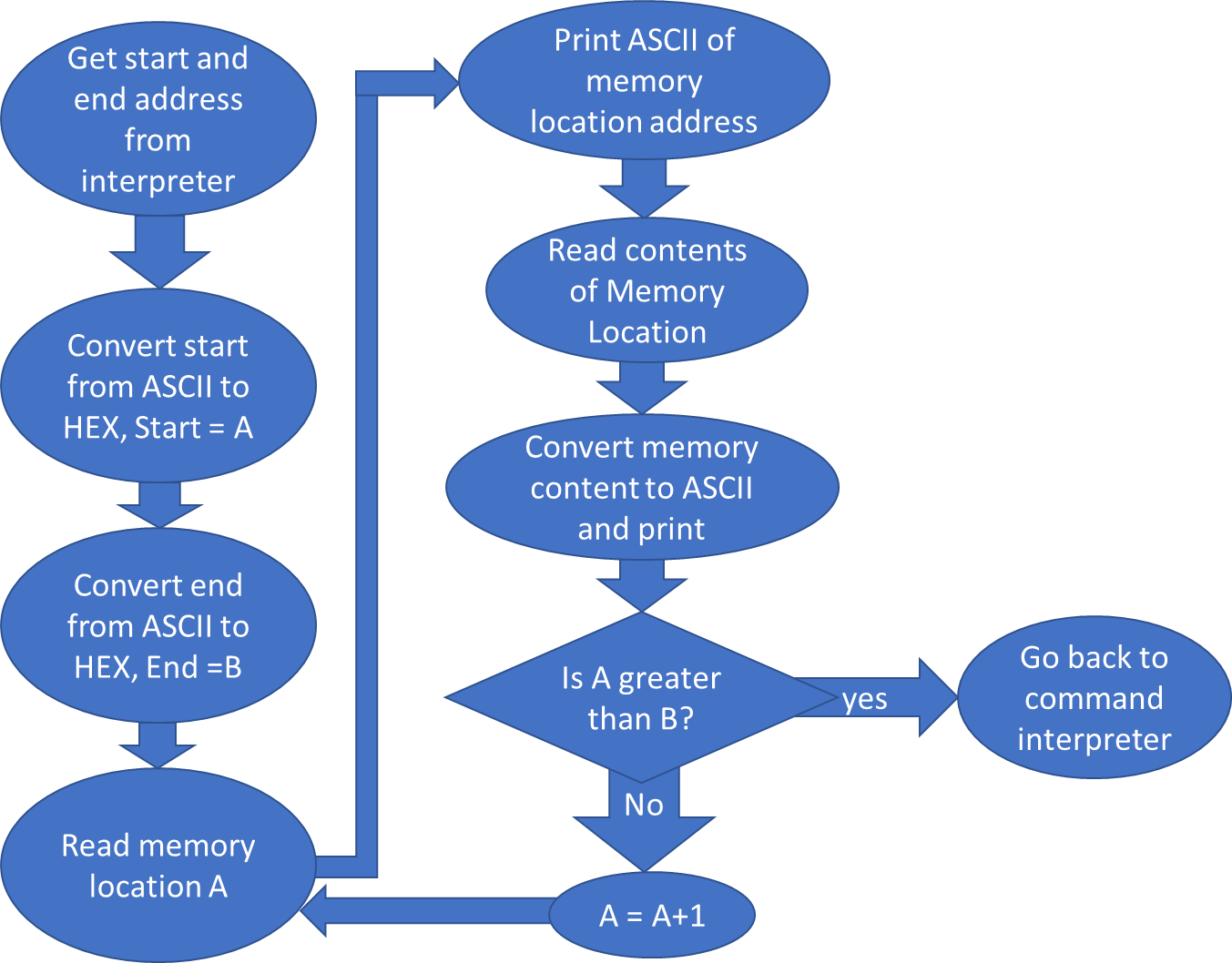
***2.2.2.1-) Memory Display Algorithm and flowchart***

It is similar to 2.2.1.1

Case I



Case II



***2.2.2.2-) Memory Display Assembly Code For Case I and Case II***

MDSPFUNCTION1 ;argument passed as D4, PRINT FROM D4 TO D5, first case where no end is given

;MOVE.L #$2000,D4

BSR ASCIITOHEX

;DISPLAY EVERYTHIGN FROM D4 FOR NOW 2000 TO 2016\

MOVE.L D4,A3

ADD.L #$10,A3 ;ENDING

MOVE.L D4,A2 ;BEGGINING

MDSPFUNCTION1L1

;PRINT MEMLOC

MOVE.L A2,D1

BSR HEXTOASCII

;bit manipulation that helps with printing memory location by byte

SWAP D1

ROL #8,D1

MOVE.B #6,D0

TRAP #15

ROL #8,D1

MOVE.B #6,D0

TRAP #15

SWAP D1

ROL #8,D1

MOVE.B #6,D0

TRAP #15

ROL #8,D1

MOVE.B #6,D0

TRAP #15

;PRINT SEMICOLON

MOVEA.L #SEMICOLONSEP,A1

MOVE.B #14,D0

TRAP #15

;PRINT CONTENT

CLR.L D1

MOVE.B (A2)+,D1

BSR HEXTOASCII

;bit manipulation that helps with printing memory location by byte

ROR #8,D1

MOVE.B #6,D0

TRAP #15

ROR #8,D1

MOVE.B #6,D0

TRAP #15

;PRINT empty space

MOVEA.L #SPACE,A1

MOVE.B #13,D0

TRAP #15

CMPA.L A2,A3

BGT MDSPFUNCTION1L1

MOVEM.L (SP)+, A0-A6/D0-D7

BRA pSTART

Case 2:

MDSPFUNCTION2 ;argument passed as D4 and D5, PRINT FROM D4 TO D5

BSR ASCIITOHEX

;DISPLAY EVERYTHIGN FROM D4 TO D5\

MOVE.L D4,A2 ;BEGGINING

MOVE.L D5,D4

BSR ASCIITOHEX

MOVE.L D4,A3 ;ENDING

ADD.L #1,A3

MDSPFUNCTION2L1

;PRINT MEMLOC

MOVE.L A2,D1

BSR HEXTOASCII

SWAP D1

ROL #8,D1

MOVE.B #6,D0

TRAP #15

ROL #8,D1

MOVE.B #6,D0

TRAP #15

SWAP D1

ROL #8,D1

MOVE.B #6,D0

TRAP #15

ROL #8,D1

MOVE.B #6,D0

TRAP #15

;PRINT SEMICOLON

MOVEA.L #SEMICOLONSEP,A1

MOVE.B #14,D0

TRAP #15

;PRINT CONTENT

CLR.L D1

MOVE.B (A2)+,D1

BSR HEXTOASCII

ROR #8,D1

MOVE.B #6,D0

TRAP #15

ROR #8,D1

MOVE.B #6,D0

TRAP #15

;PRINT empty space

MOVEA.L #SPACE,A1

MOVE.B #13,D0

TRAP #15

CMPA.L A2,A3

BGT MDSPFUNCTION2L1

MOVEM.L (SP)+, A0-A6/D0-D7

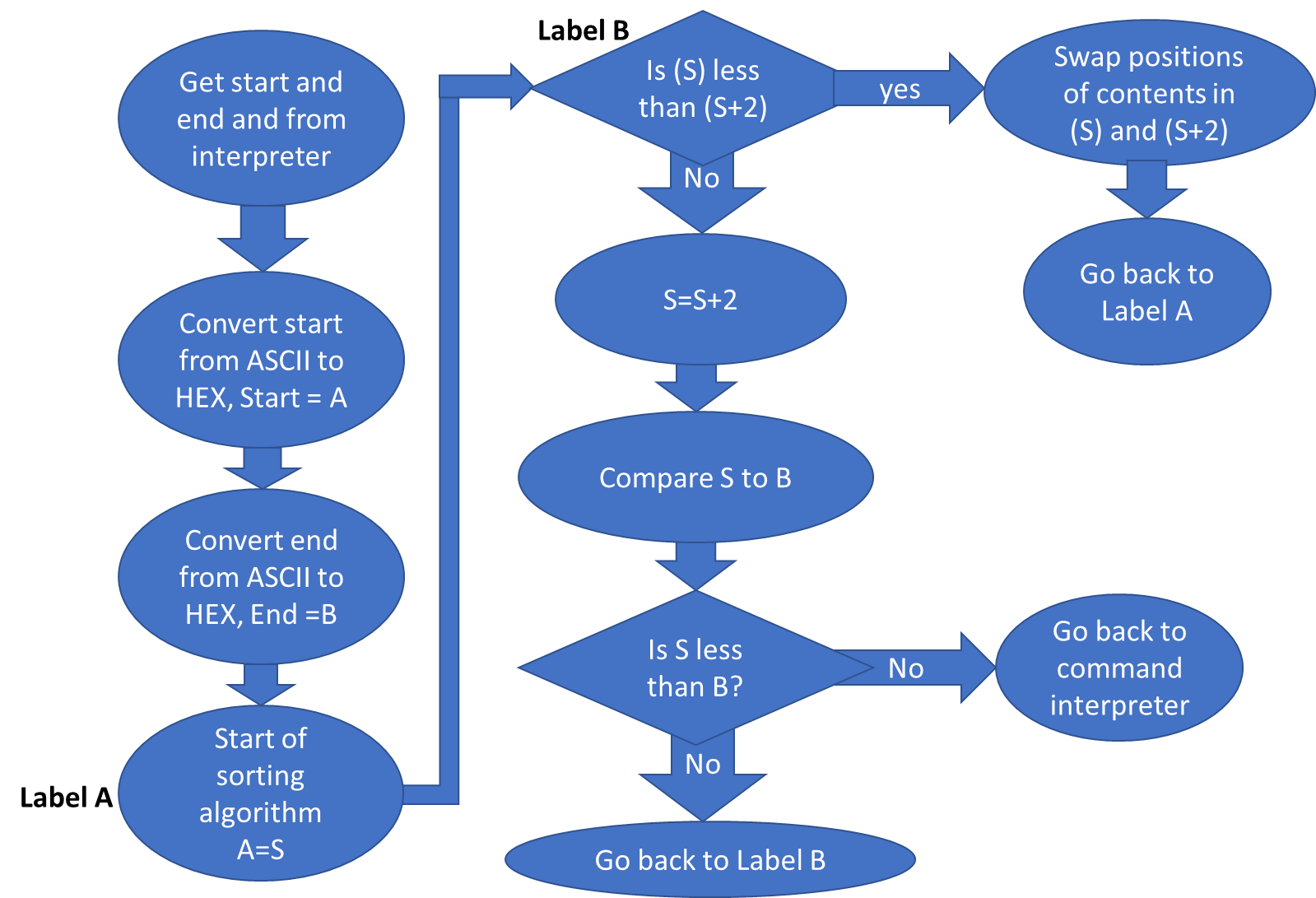
BRA pSTART

***2.2.3-) Sort***

It is similar to 2.2.1

***2.2.3.1-) Sort Flowchart***

Sort Ascending



\*explain small difference between descending and ascending

***2.2.3.2-) Sort Assembly Code***

SORTWFUNCTION ;D4 IS BEGGINNG D5 IS END AND D6 IS Ascending OR Descending, SORT W accordingly

BSR ASCIITOHEX

MOVE.L D4,A0 ;BEGGINING

MOVE.L D5,D4

BSR ASCIITOHEX

MOVE.L D4,A1 ;END

SUB.L #2,A1

MOVE.L A0,A2

CMP.B #'A',D6

BEQ SORTWLA3

SORTWL3 ;Sort for descending

MOVE.L A2,A0

SORTWL2

CMP.W (A0)+,(A0)+

BHI.S SORTWL1 ;RECHECK

SUBQ.L #2,A0

CMP.L A0,A1

BGE SORTWL2 ;RECHECK

MOVEM.L (SP)+, A0-A6/D0-D7

BRA pSTART

SORTWL1

MOVE.L -(A0),D0

SWAP.W D0

MOVE.L D0,(A0)

BRA SORTWL3

SORTWLA3 ;Sort for Ascending

MOVE.L A2,A0

SORTWLA2

CMP.W (A0)+,(A0)+

BLT.S SORTWLA1 ;RECHECK

SUBQ.L #2,A0 ;getting current position of pointer

CMP.L A0,A1 ;comparing it to endpoint

BGE SORTWLA2 ;If end is not reached loop back

MOVEM.L (SP)+, A0-A6/D0-D7

BRA pSTART

SORTWLA1

MOVE.L -(A0),D0

SWAP.W D0

MOVE.L D0,(A0) ;swaps position of current element with next

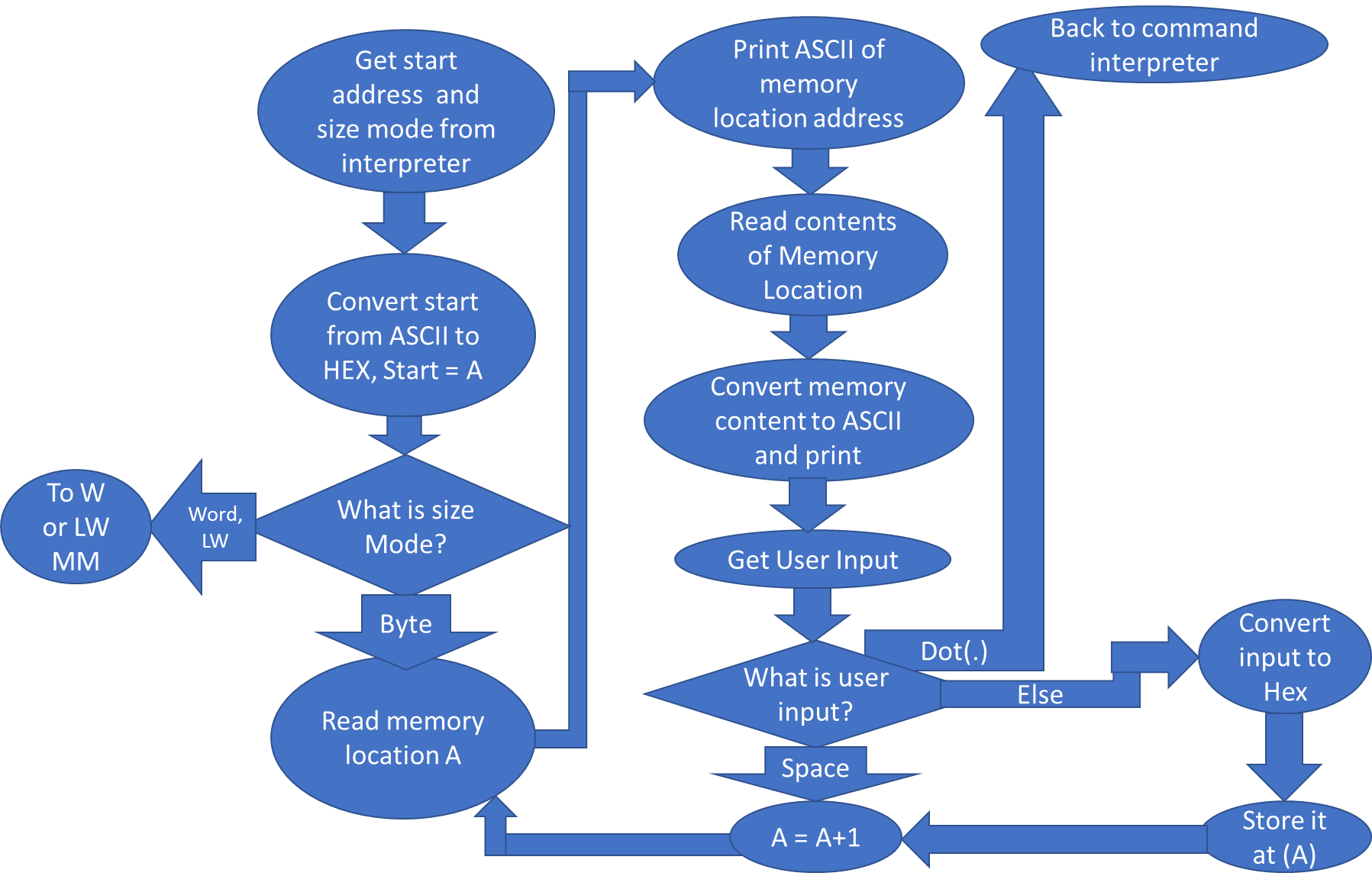
BRA SORTWLA3

***2.2.4-) Memory Modify***

\*explain difference of MM W and MM L and MM L

***2.2.4.1-) Memory Modify Flowchart***

Memory Modify Byte



***2.2.4.2-) Memory Modify Assembly Code***

MMFUNCTION ;argument passed as D4 AS MEMLOC AND d5 AS THE MODE

BSR ASCIITOHEX

;DISPLAY EVERYTHIGN FROM D4 TO D5\

MOVE.L D4,A2 ;BEGGINING

;IGNORING B,M,L BUSSINESS FOR NOW AND ASSUMING B

CMP.B #'B',D5

BEQ MMFUNCTIONL1 ;FUNCTION

CMP.B #'W',D5

BEQ MMFUNCTIONL2 ;FUNCTION

CMP.B #'L',D5

BEQ MMFUNCTIONL3 ;FUNCTION

MMFUNCTIONL1

;PRINT MEMLOC

MOVE.L A2,D1

BSR HEXTOASCII

SWAP D1

ROL #8,D1

MOVE.B #6,D0

TRAP #15

ROL #8,D1

MOVE.B #6,D0

TRAP #15

SWAP D1

ROL #8,D1

MOVE.B #6,D0

TRAP #15

ROL #8,D1

MOVE.B #6,D0

TRAP #15

;PRINT SEMICOLON

MOVEA.L #SEMICOLONSEP,A1

MOVE.B #14,D0

TRAP #15

;PRINT CONTENT

CLR.L D1

MOVE.B (A2)+,D1

BSR HEXTOASCII

ROR #8,D1

MOVE.B #6,D0

TRAP #15

ROR #8,D1

MOVE.B #6,D0

TRAP #15

;PRINT LINEPROMPT,

MOVEA.L #LINEPROMPT,A1

MOVE.B #14,D0

TRAP #15

;PROMPT FOR INPUT,CONTINUE UNLESS IT IS DOT

LEA $5000,A1

MOVE.B #2,D0

TRAP #15

\*COMPARING INPUT TO THE MENU ITEMS\*

;COMPARING TO DOT

CMP.B #$2E,(A1) ;2E IS THE DOT

BEQ pSTART ;if input is dot exit

;IF INPUT IS EMPTY MOVE ON TO THE NEXT BIT

CMP.B #00,(A1)

BEQ MMFUNCTIONL1

;IF INPUT ARE NEITHER READ THE ENTERED LINE CONVERT TO HEXT AND STORE

MOVE.W (A1),D4

BSR ASCIITOHEX

MOVE.B D4,-1(A2)

BRA MMFUNCTIONL1

MMFUNCTIONL2 ;FOR WORD OPERATION MM

;PRINT MEMLOC

MOVE.L A2,D1

BSR HEXTOASCII

SWAP D1

ROL #8,D1

MOVE.B #6,D0

TRAP #15

ROL #8,D1

MOVE.B #6,D0

TRAP #15

SWAP D1

ROL #8,D1

MOVE.B #6,D0

TRAP #15

ROL #8,D1

MOVE.B #6,D0

TRAP #15

;PRINT SEMICOLON

MOVEA.L #SEMICOLONSEP,A1

MOVE.B #14,D0

TRAP #15

;PRINT CONTENT

CLR.L D1

MOVE.W (A2)+,D1

BSR HEXTOASCII

SWAP D1

ROL #8,D1

MOVE.B #6,D0

TRAP #15

ROL #8,D1

MOVE.B #6,D0

TRAP #15

SWAP D1

ROL #8,D1

MOVE.B #6,D0

TRAP #15

ROL #8,D1

MOVE.B #6,D0

TRAP #15

;PRINT LINEPROMPT,

MOVEA.L #LINEPROMPT,A1

MOVE.B #14,D0

TRAP #15

;PROMPT FOR INPUT,CONTINUE UNLESS IT IS DOT

LEA $5000,A1

MOVE.B #2,D0

TRAP #15

\*COMPARING INPUT TO THE MENU ITEMS\*

;COMPARING TO DOT

CMP.B #$2E,(A1) ;2E IS THE DOT

BEQ pSTART ;if input is dot exit

;IF INPUT IS EMPTY MOVE ON TO THE NEXT BIT

CMP.B #00,(A1)

BEQ MMFUNCTIONL2

;IF INPUT ARE NEITHER READ THE ENTERED LINE CONVERT TO HEXT AND STORE

MOVE.L (A1),D4

BSR ASCIITOHEX

MOVE.W D4,-2(A2)

BRA MMFUNCTIONL2

MMFUNCTIONL3 ;FOR LONG WORD MM OPERATION

;PRINT MEMLOC

MOVE.L A2,D1

BSR HEXTOASCII

SWAP D1

ROL #8,D1

MOVE.B #6,D0

TRAP #15

ROL #8,D1

MOVE.B #6,D0

TRAP #15

SWAP D1

ROL #8,D1

MOVE.B #6,D0

TRAP #15

ROL #8,D1

MOVE.B #6,D0

TRAP #15

;PRINT SEMICOLON

MOVEA.L #SEMICOLONSEP,A1

MOVE.B #14,D0

TRAP #15

;PRINT CONTENT

CLR.L D1

MOVE.W (A2)+,D1

BSR HEXTOASCII

SWAP D1

ROL #8,D1

MOVE.B #6,D0

TRAP #15

ROL #8,D1

MOVE.B #6,D0

TRAP #15

SWAP D1

ROL #8,D1

MOVE.B #6,D0

TRAP #15

ROL #8,D1

MOVE.B #6,D0

TRAP #15

;PRINT SECOND WORD

;PRINT CONTENT

CLR.L D1

MOVE.W (A2)+,D1

BSR HEXTOASCII

SWAP D1

ROL #8,D1

MOVE.B #6,D0

TRAP #15

ROL #8,D1

MOVE.B #6,D0

TRAP #15

SWAP D1

ROL #8,D1

MOVE.B #6,D0

TRAP #15

ROL #8,D1

MOVE.B #6,D0

TRAP #15

;PRINT LINEPROMPT,

MOVEA.L #LINEPROMPT,A1

MOVE.B #14,D0

TRAP #15

;PROMPT FOR INPUT,CONTINUE UNLESS IT IS DOT

LEA $5000,A1

MOVE.B #2,D0

TRAP #15

\*COMPARING INPUT TO THE MENU ITEMS\*

;COMPARING TO DOT

CMP.B #$2E,(A1) ;2E IS THE DOT

BEQ pSTART ;if input is dot exit

;IF INPUT IS EMPTY MOVE ON TO THE NEXT BIT

CMP.B #00,(A1)

BEQ MMFUNCTIONL3

;IF INPUT ARE NEITHER READ THE ENTERED LINE CONVERT TO HEXT AND STORE

MOVE.L (A1)+,D4

BSR ASCIITOHEX

MOVE.W D4,-4(A2)

;PRINT SECOND WORD

MOVE.L (A1),D4

BSR ASCIITOHEX

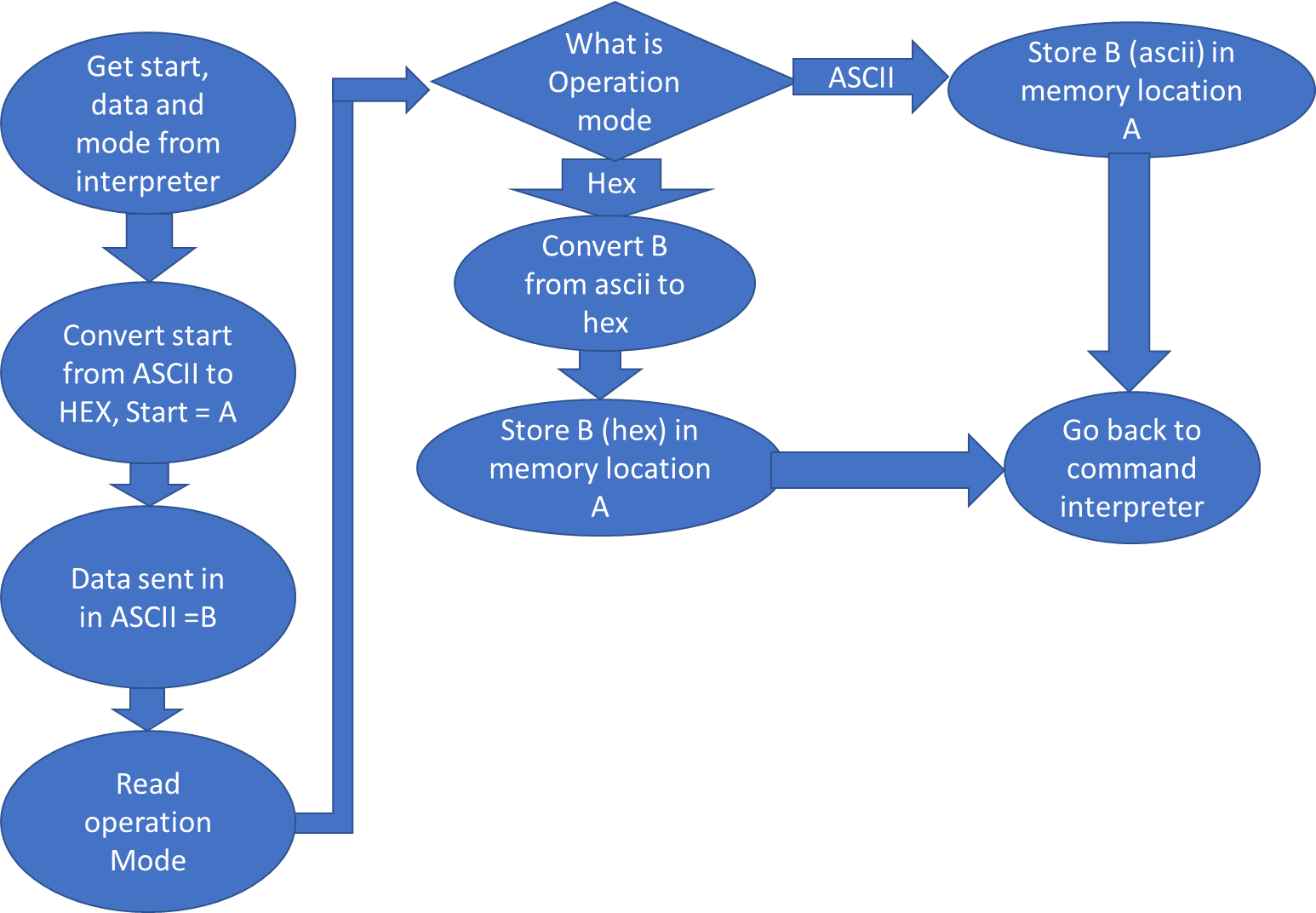
MOVE.W D4,-2(A2)

BRA MMFUNCTIONL3

***2.2.5-) Memory Set***

It is similar to 2.2.1

***2.2.5.1-) Memory Set Flowchart***



***2.2.5.2-) Memory Set Assembly Code***

MSFUNCTION ;D4 IS ADDRESS, D5 IS DATA, D6 IS ASCII OR HEX, WORD OPERATIONS ONLY, Store data in D4 depending on whether its ascii or hex

BSR ASCIITOHEX

MOVE.L D4,A2 ;MEMLOC FOR DATA TO BE STORED

;IGNORING B,M,L BUSSINESS FOR NOW AND ASSUMING B

CMP.B #'H',D6

BEQ MSFUNCTIONL1 ;FUNCTION FOR WHEN THE NUM GIVEN IS HEX

CMP.B #'A',D6

BEQ MSFUNCTIONL2 ;FUNCTION FOR WHE THE NUM GIVEN IS ASCII

MSFUNCTIONL1

MOVE.L D5,D4

BSR ASCIITOHEX

MOVE.W D4,(A2)

MOVEM.L (SP)+,A0-A6/D0-D7

BRA pSTART

MSFUNCTIONL2

MOVE.L D5,(A2)

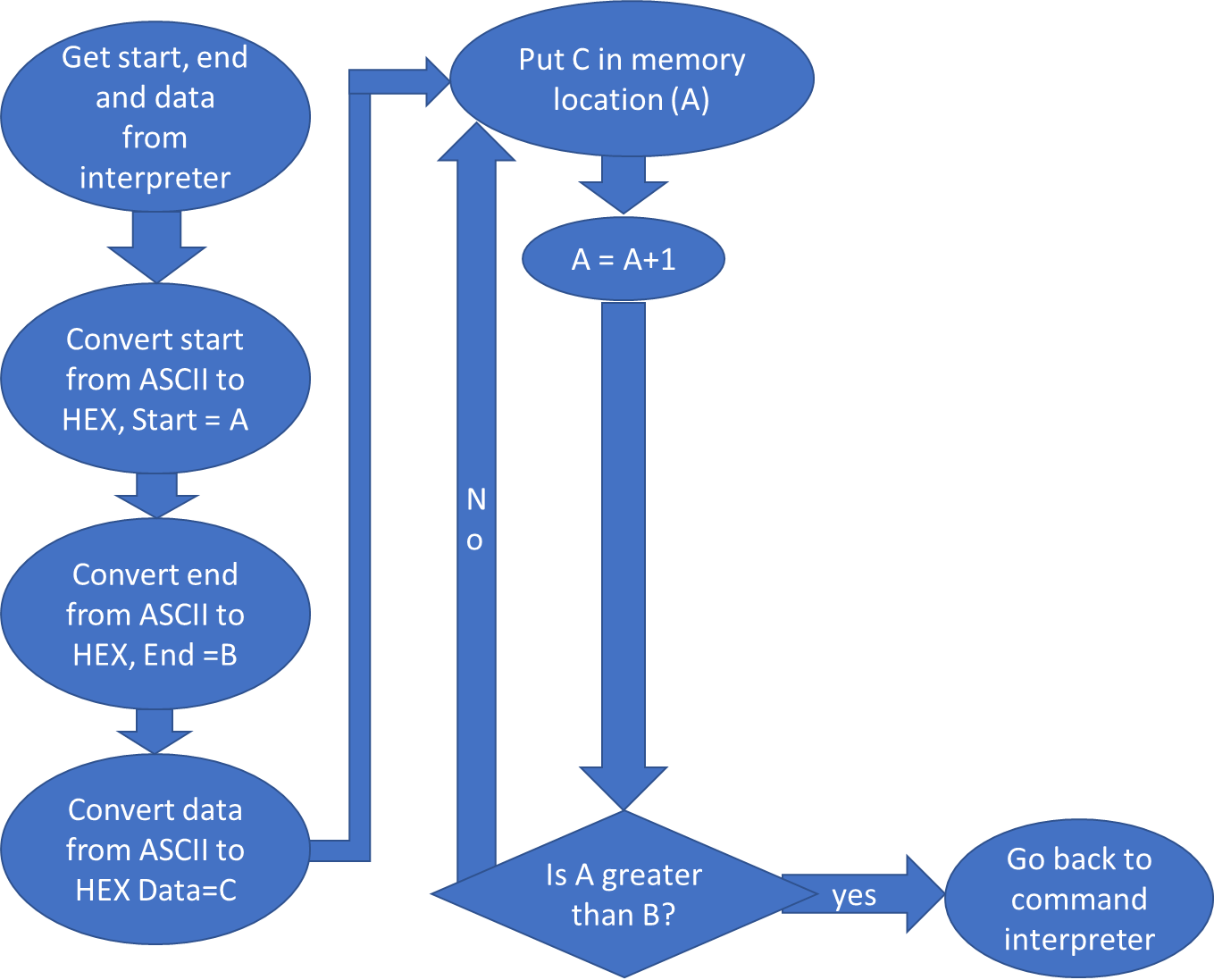
MOVEM.L (SP)+, A0-A6/D0-D7

BRA pSTART

***2.2.6-) Block Fill***

It is similar to 2.2.1

***2.2.6.1-) Block Fill Flowchart***



***2.2.6.2-) Block Fill Assembly Code***

BFFUNCTION ;D4 IS THE START, D5 IS THE END, D6 IS THE NUMBER TO BE WRITTEN

;FILL EVERYTHIGN FROM D4 TO D5 WITH D6

BSR ASCIITOHEX

MOVE.L D4,A2 ;BEGGINING

MOVE.L D5,D4

BSR ASCIITOHEX

MOVE.L D4,A3 ;ENDING

ADD.L #1,A3 ;MAKE SURE LAST ONE IS ENTERED

MOVE.L D6,D4

BSR ASCIITOHEX

MOVE.L D4,D6 ;THE VALUE TO BE ENTERED IN THE MEMORY BLOCK

BFFUNCTIONL1

;MOVE THE WORD INTO THE ADDRESS

MOVE.W D6,(A2)+

CMPA.L A2,A3

BGT BFFUNCTIONL1

;WHEN DONE

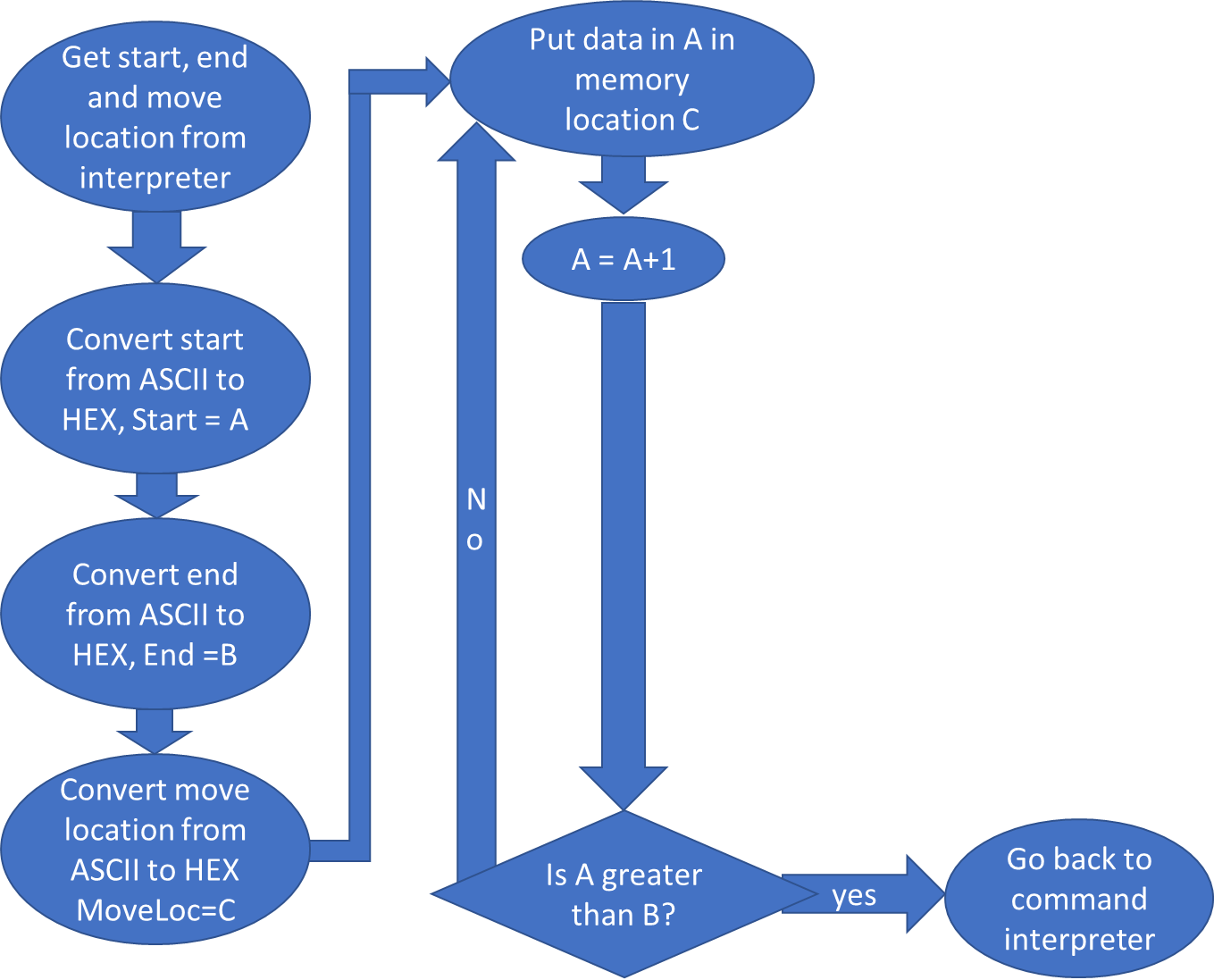
MOVEM.L (SP)+,A0-A6/D0-D7

BRA pSTART

***2.2.7-) Block Move***

It is similar to 2.2.1

***2.2.7.1-) Block Move Flowchart***



***2.2.7.2-) Block Move Assembly Code***

BMOVFUNCTION ;D4 IS THE START,D5 IS THE END, D6 IS THE LOCATION WE ARE WRITING TO

BSR ASCIITOHEX

MOVE.L D4,A2 ;BEGGINING

MOVE.L D5,D4

BSR ASCIITOHEX

MOVE.L D4,A3 ;ENDING

ADD.L #1,A3 ;MAKE SURE LAST ONE IS ENTERED

MOVE.L D6,D4

BSR ASCIITOHEX

MOVE.L D4,A4 ;THE DESTINATION

BMOVFUNCTIONL1

;MOVE THE WORD INTO THE ADDRESS

MOVE.B (A2)+,(A4)+

CMPA.L A2,A3

BGT BMOVFUNCTIONL1

;WHEN DONE

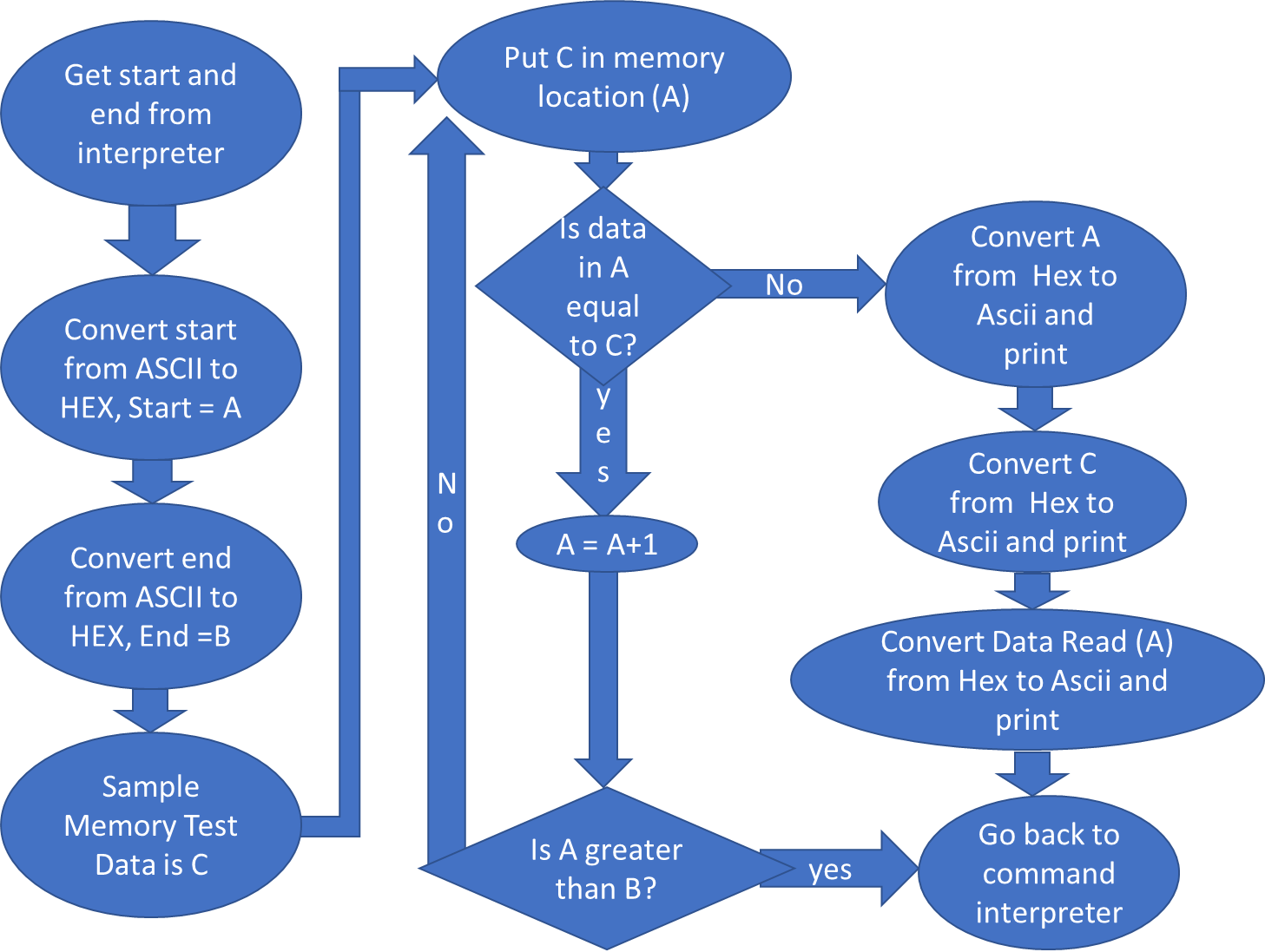
MOVEM.L (SP)+, A0-A6/D0-D7

BRA pSTART

***2.2.8-) Block Test***

It is similar to 2.2.1

***2.2.8.1-) Block Test Flowchart***



***2.2.8.2-) Block Test Assembly Code***

BTSTFUNCTION

BSR ASCIITOHEX

MOVE.L D4,A2 ;BEGGINING

MOVE.L D5,D4

BSR ASCIITOHEX

MOVE.L D4,A3 ;ENDING

ADD.L #1,A3 ;MAKE SURE LAST ONE IS ENTERED

MOVE.L #$A5A5,D4

;DESTRUCTIVE PART SEARCH IS AT D4

BTSTFUNCTIONL1

MOVE.W D4,(A2) ;MOVE THE WORD TO START

MOVE.W (A2)+,D5 ;READ THE WORD

CMP.W D4,D5

BNE BTSTERROR ;IF NOT EQUAL GO TO SUBROUTINE

CMPA.L A2,A3

BGT BTSTFUNCTIONL1

MOVEA.L #BTSTSUCCESS,A1

MOVE.B #13,D0

TRAP #15

MOVEM.L (SP)+, A0-A6/D0-D7

BRA pSTART

BTSTERROR ;Print Error Message

MOVEA.L #BTSTFAIL,A1

MOVE.B #13,D0

TRAP #15

;PRINT ADDRESSS

MOVEA.L #ADDRESS,A1

MOVE.B #14,D0

TRAP #15

SUB.L #2,A2

MOVE.W A2,D1

BSR HEXTOASCII

SWAP D1

ROL #8,D1

MOVE.B #6,D0

TRAP #15

ROL #8,D1

MOVE.B #6,D0

TRAP #15

SWAP D1

ROL #8,D1

MOVE.B #6,D0

TRAP #15

ROL #8,D1

MOVE.B #6,D0

TRAP #15

MOVEA.L #SPACE,A1

MOVE.B #13,D0

TRAP #15

;PRINT WRITTEN DATA

MOVEA.L #DATASTORED,A1

MOVE.B #14,D0

TRAP #15

MOVE.W D4,D1

BSR HEXTOASCII

SWAP D1

ROL #8,D1

MOVE.B #6,D0

TRAP #15

ROL #8,D1

MOVE.B #6,D0

TRAP #15

SWAP D1

ROL #8,D1

MOVE.B #6,D0

TRAP #15

ROL #8,D1

MOVE.B #6,D0

TRAP #15

MOVEA.L #SPACE,A1

MOVE.B #13,D0

TRAP #15

;PRINT DATA READ

MOVEA.L #DATAREAD,A1

MOVE.B #14,D0

TRAP #15

MOVE.W D5,D1

BSR HEXTOASCII

SWAP D1

ROL #8,D1

MOVE.B #6,D0

TRAP #15

ROL #8,D1

MOVE.B #6,D0

TRAP #15

SWAP D1

ROL #8,D1

MOVE.B #6,D0

TRAP #15

ROL #8,D1

MOVE.B #6,D0

TRAP #15

MOVEA.L #SPACE,A1

MOVE.B #13,D0

TRAP #15

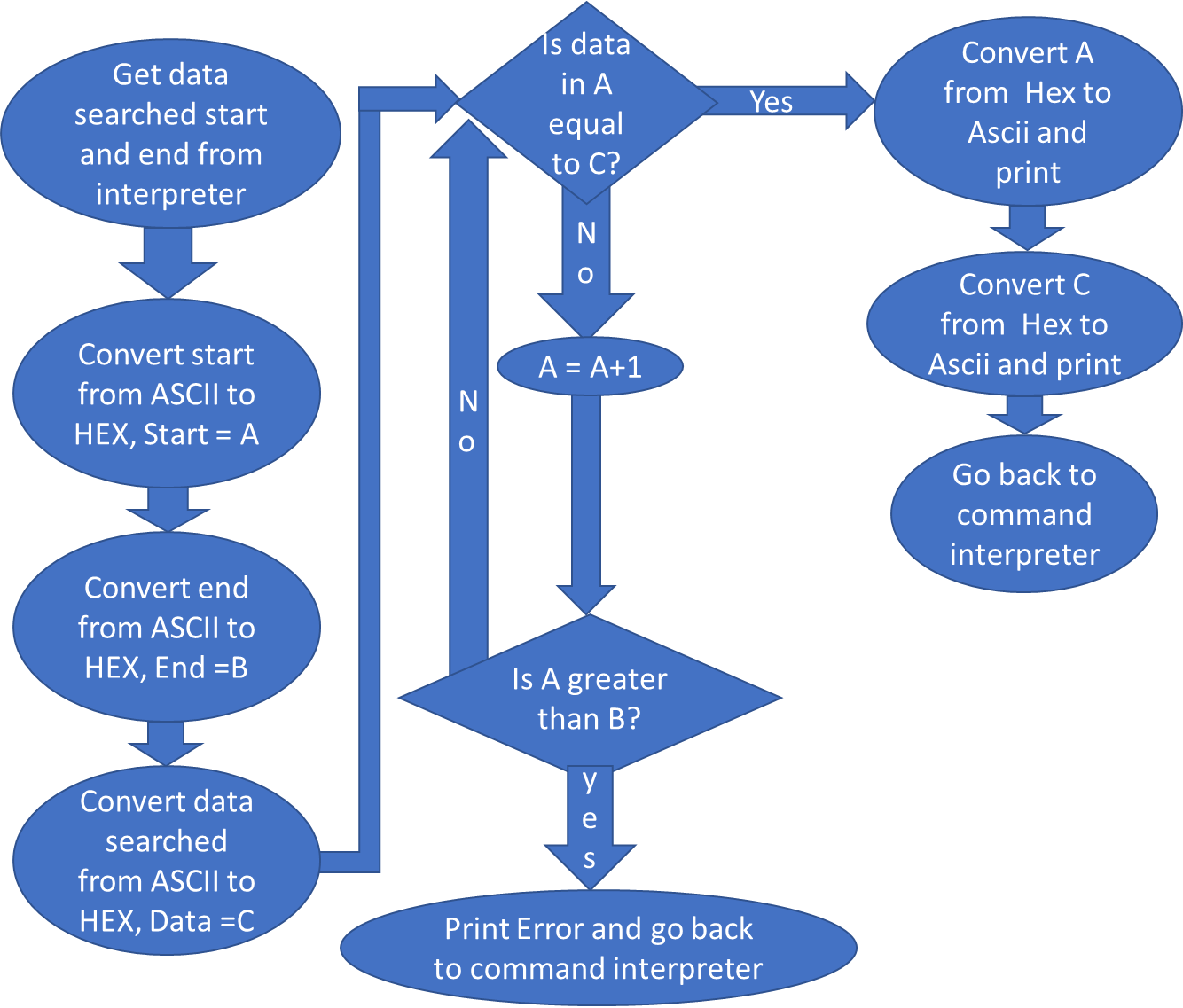
MOVEM.L (SP)+, A0-A6/D0-D7

BRA pSTART

***2.2.9-) Block Search***

It is similar to 2.2.1

***2.2.9.1-) Block Search Flowchart***



***2.2.9.2-) Block Search Assembly Code***

BSCHFUNCTION ;D4 IS START ADDRESS, D5 IS END ANDRESS AND D6 IS THE ITEM WE ARE LOOKING FOR, Find the Item and print Success message if found else Error Message

BSR ASCIITOHEX

MOVE.L D4,A2 ;BEGGINING

MOVE.L D5,D4

BSR ASCIITOHEX

MOVE.L D4,A3 ;ENDING

ADD.L #1,A3 ;MAKE SURE LAST ONE IS ENTERED

MOVE.L D6,D4

BSR ASCIITOHEX

;SEARCH IS AT D4

BSCHFUNCTIONL1

;LOOK FOR WORD IN THE ADDRESS RANGE

MOVE.W (A2)+,D5

CMP.W D4,D5

BEQ BSCHEQUAL

CMPA.L A2,A3

BGT BSCHFUNCTIONL1

MOVEA.L #SEARCHFAIL,A1

MOVE.B #13,D0

TRAP #15

MOVEM.L (SP)+, A0-A6/D0-D7

BRA pSTART

BSCHEQUAL

MOVEA.L #SEARCHSUCCESS,A1

MOVE.B #13,D0

TRAP #15

;PRINT ADDRESSS

MOVEA.L #ADDRESS,A1

MOVE.B #14,D0

TRAP #15

SUB.L #2,A2

MOVE.W A2,D1

BSR HEXTOASCII

SWAP D1

ROL #8,D1

MOVE.B #6,D0

TRAP #15

ROL #8,D1

MOVE.B #6,D0

TRAP #15

SWAP D1

ROL #8,D1

MOVE.B #6,D0

TRAP #15

ROL #8,D1

MOVE.B #6,D0

TRAP #15

MOVEA.L #SPACE,A1

MOVE.B #13,D0

TRAP #15

;PRINT DATA

MOVEA.L #DATA,A1

MOVE.B #14,D0

TRAP #15

MOVE.W D4,D1

BSR HEXTOASCII

SWAP D1

ROL #8,D1

MOVE.B #6,D0

TRAP #15

ROL #8,D1

MOVE.B #6,D0

TRAP #15

SWAP D1

ROL #8,D1

MOVE.B #6,D0

TRAP #15

ROL #8,D1

MOVE.B #6,D0

TRAP #15

MOVEA.L #SPACE,A1

MOVE.B #13,D0

TRAP #15

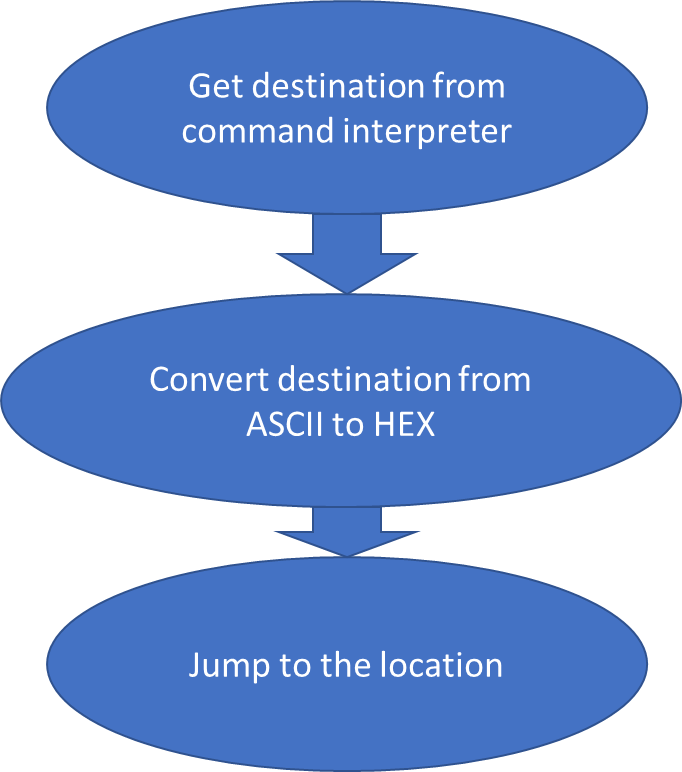
MOVEM.L (SP)+, A0-A6/D0-D7

BRA pSTART

***2.2.10-) Execute Program***

\*Explain how it can act as a jump and user would have a trap that would return the execution

***2.2.10.1-) Execute Program Flowchart***



***2.2.10.2-) Execute Program Assembly Code***

GOFUNCTION ;D4 IS THE MEMLOC TO EXECUTE

BSR ASCIITOHEX

MOVE.L D4,A1

BSR (A1)

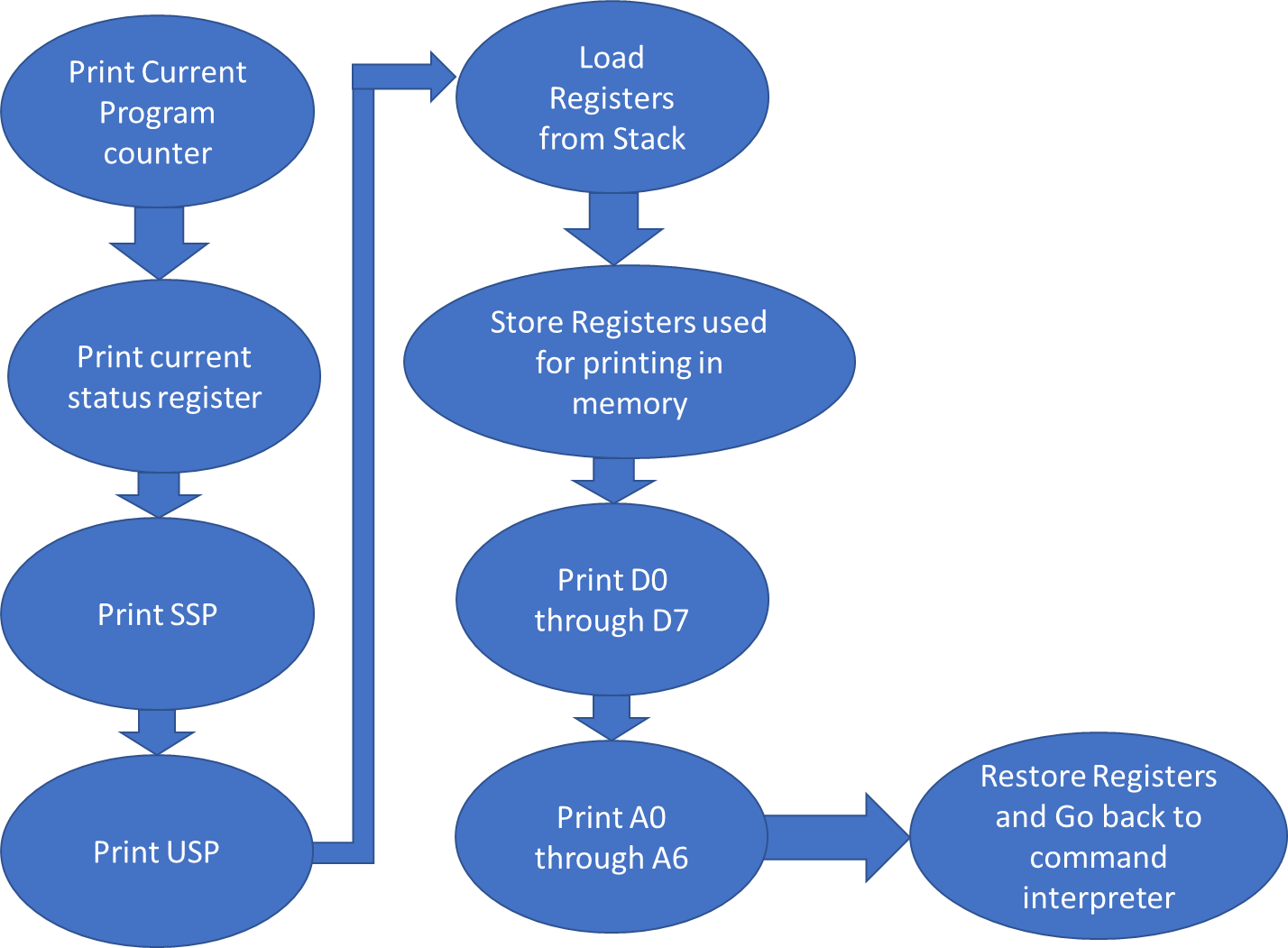
MOVEM.L (SP)+, A0-A6/D0-D7

BRA pSTART

***2.2.11-) Display Formatted Registers***

It is similar to 2.2.1

***2.2.11.1-) Display Formatted Registers Algorithm and Flowchart***



***2.2.11.2-) Display Formatted Registers Assembly Code***

DFFUNCTION

;PRINT PC

MOVEA.L #PCDF,A1

MOVE.B #14,D0

TRAP #15

PCHERE

MOVE #PCHERE,D1

MOVE.B #16,D2

;MOVEA.L PC,A1

MOVE.B #15,D0

TRAP #15

MOVEA.L #SPACE,A1

MOVE.B #13,D0

TRAP #15

;PRINT SR

MOVEA.L #SRDF,A1

MOVE.B #14,D0

TRAP #15

MOVE SR,D1

MOVE.B #16,D2

MOVE.B #15,D0

TRAP #15

MOVEA.L #SPACE,A1

MOVE.B #13,D0

TRAP #15

;PRINT SSP

MOVEA.L #SSPDF,A1

MOVE.B #14,D0

TRAP #15

MOVE A7,D1

MOVE.B #16,D2

MOVE.B #15,D0

TRAP #15

MOVEA.L #SPACE,A1

MOVE.B #13,D0

TRAP #15

;PRINT USP

MOVEA.L #USPDF,A1

MOVE.B #14,D0

TRAP #15

MOVE.L USP,A1

MOVE.L A1,D1

MOVE.B #16,D2

MOVE.B #15,D0

TRAP #15

MOVEA.L #SPACE,A1

MOVE.B #13,D0

TRAP #15

;load values from memory

MOVEM.L (SP)+, A0-A6/D0-D7

;save it to a mem loc

MOVE.L D0,$8000

MOVE.L D1,$8004

MOVE.L D2,$8008

MOVE.L A1,$8012

;read memlocs and print a and d regs

;D0

MOVEA.L #D0DF,A1

MOVE.B #14,D0

TRAP #15

MOVE $8000,D1

MOVE.B #16,D2

MOVE.B #15,D0

TRAP #15

MOVEA.L #SPACE,A1

MOVE.B #13,D0

TRAP #15

;D1

MOVEA.L #D1DF,A1

MOVE.B #14,D0

TRAP #15

MOVE $8004,D1

MOVE.B #16,D2

MOVE.B #15,D0

TRAP #15

MOVEA.L #SPACE,A1

MOVE.B #13,D0

TRAP #15

;D2

MOVEA.L #D2DF,A1

MOVE.B #14,D0

TRAP #15

MOVE $8008,D1

MOVE.B #16,D2

MOVE.B #15,D0

TRAP #15

MOVEA.L #SPACE,A1

MOVE.B #13,D0

TRAP #15

;D3

MOVEA.L #D3DF,A1

MOVE.B #14,D0

TRAP #15

MOVE D3,D1

MOVE.B #16,D2

MOVE.B #15,D0

TRAP #15

MOVEA.L #SPACE,A1

MOVE.B #13,D0

TRAP #15

;D4

MOVEA.L #D4DF,A1

MOVE.B #14,D0

TRAP #15

MOVE D4,D1

MOVE.B #16,D2

MOVE.B #15,D0

TRAP #15

MOVEA.L #SPACE,A1

MOVE.B #13,D0

TRAP #15

;D5

MOVEA.L #D5DF,A1

MOVE.B #14,D0

TRAP #15

MOVE D5,D1

MOVE.B #16,D2

MOVE.B #15,D0

TRAP #15

MOVEA.L #SPACE,A1

MOVE.B #13,D0

TRAP #15

;D6

MOVEA.L #D6DF,A1

MOVE.B #14,D0

TRAP #15

MOVE D6,D1

MOVE.B #16,D2

MOVE.B #15,D0

TRAP #15

MOVEA.L #SPACE,A1

MOVE.B #13,D0

TRAP #15

;D7

MOVEA.L #D7DF,A1

MOVE.B #14,D0

TRAP #15

MOVE D7,D1

MOVE.B #16,D2

MOVE.B #15,D0

TRAP #15

MOVEA.L #SPACE,A1

MOVE.B #13,D0

TRAP #15

;A0

MOVEA.L #A0DF,A1

MOVE.B #14,D0

TRAP #15

MOVE A0,D1

MOVE.B #16,D2

MOVE.B #15,D0

TRAP #15

MOVEA.L #SPACE,A1

MOVE.B #13,D0

TRAP #15

;A1

MOVEA.L #A1DF,A1

MOVE.B #14,D0

TRAP #15

MOVE $8012,D1

MOVE.B #16,D2

MOVE.B #15,D0

TRAP #15

MOVEA.L #SPACE,A1

MOVE.B #13,D0

TRAP #15

;A2

MOVEA.L #A2DF,A1

MOVE.B #14,D0

TRAP #15

MOVE A2,D1

MOVE.B #16,D2

MOVE.B #15,D0

TRAP #15

MOVEA.L #SPACE,A1

MOVE.B #13,D0

TRAP #15

;A3

MOVEA.L #A4DF,A1

MOVE.B #14,D0

TRAP #15

MOVE A3,D1

MOVE.B #16,D2

MOVE.B #15,D0

TRAP #15

MOVEA.L #SPACE,A1

MOVE.B #13,D0

TRAP #15

;A4

MOVEA.L #A4DF,A1

MOVE.B #14,D0

TRAP #15

MOVE A4,D1

MOVE.B #16,D2

MOVE.B #15,D0

TRAP #15

MOVEA.L #SPACE,A1

MOVE.B #13,D0

TRAP #15

;A5

MOVEA.L #A5DF,A1

MOVE.B #14,D0

TRAP #15

MOVE A5,D1

MOVE.B #16,D2

MOVE.B #15,D0

TRAP #15

MOVEA.L #SPACE,A1

MOVE.B #13,D0

TRAP #15

;A6

MOVEA.L #A6DF,A1

MOVE.B #14,D0

TRAP #15

MOVE A6,D1

MOVE.B #16,D2

MOVE.B #15,D0

TRAP #15

MOVEA.L #SPACE,A1

MOVE.B #13,D0

TRAP #15

;MOVING OLD VALUES BACK TO D0,D1,D2 AND A1

MOVE.L $8000,D0

MOVE.L $8004,D1

MOVE.L $8008,D2

MOVE.L $8012,A1

BRA pSTART

***2.2.12-) Exit Monitor Program***

It is similar to 2.2.1

***2.2.12.1-) Exit Monitor Program Flowchart***



***2.2.12.2-) Exit Monitor Program Assembly Code***

EXITFUNCTION

MOVE.B #9,D0

TRAP #15

***2.2.13-) Hex to ASCII and ASCII to Hex Convertor***

It is similar to 2.2.1

***2.2.13.1-) Hex to ASCII and ASCII to Hex Convertor Flowchart***

It is similar to 2.2.1.1

***2.2.13.2-) Hex to ASCII and ASCII to Hex Convertor Assembly Code***

CONVERTFUNCTION: ;D4 IS THE DATA IN ASCII, D5 IS THE MODE, IF A, CONVERT IT TO ASCII AND STORE IN 8000, IF H CONVERT THE NUMBER TO HEX AND STORE IT

CMP.B #'H',D5

BEQ CONVERTFUNCTIONL1 ;CONVERT TO HEX AND DISPLAY

CMP.B #'A',D5

BEQ CONVERTFUNCTIONL2 ;CONVERT TO ASCII AND DISPLAY

CONVERTFUNCTIONL1 ;CONVERTS ASCII TO HEX AND DISPLAYS

BSR ASCIITOHEX

SWAP.W D4

ADD.W #$3030,D4 ;ADD 0 0 AS PRECURSOR

SWAP.W D4 ;SWAP BACK TO NORMAL ORDER

MOVE.L D4,D1 ; ALREADY HAVE IT IN ASCII

;PRINT NUMBER 1 BY 1

\* SWAP D1

\*ROL #8,D1

\* MOVE.B #6,D0

\*TRAP #15

\*ROL #8,D1

\*MOVE.B #6,D0

\*TRAP #15

\*SWAP D1

ROL #8,D1

MOVE.B #6,D0

TRAP #15

ROL #8,D1

MOVE.B #6,D0

TRAP #15

MOVEA.L #SPACE ,A1

MOVE.B #13,D0

TRAP #15

MOVEM.L (SP)+,A0-A6/D0-D7

BRA pSTART

CONVERTFUNCTIONL2 ;CONVERTS HEX TO ASCII AND DISPLAYS

;STORE IT IN A REGISTER

MOVE.L D4,D1

;DISPLAY AS IS

MOVE.B #16,D2

MOVE.B #15,D0

TRAP #15

;PRINT SPACE FOR NEXT LINE

MOVEA.L #SPACE ,A1

MOVE.B #13,D0

TRAP #15

MOVEM.L (SP)+,A0-A6/D0-D7

BRA pSTART

***2.2.14-) Clear Registers***

It is similar to 2.2.1

***2.2.14.1-) Clear Registers Flowchart***

It is similar to 2.2.1.1

***2.2.14.2-) Clear Registers Assembly Code***

REGCLRFUNCTION:

;CLEAR A REGISTERS

MOVE.L #0,A0

MOVE.L #0,A1

MOVE.L #0,A2

MOVE.L #0,A3

MOVE.L #0,A4

MOVE.L #0,A5

MOVE.L #0,A6

;CLEAR D REGISTERS

MOVE.L #0,D1

MOVE.L #0,D2

MOVE.L #0,D3

MOVE.L #0,D4

MOVE.L #0,D5

MOVE.L #0,D6

MOVE.L #0,D7

;DISPLAY REGISTERS CLEARED MESSAGE

MOVEM.L A1/D0,-(SP)

MOVEA.L #REGCLRPROMPT,A1

MOVE.B #13,D0

TRAP #15

MOVEM.L (SP)+,A1/D0

BRA pSTART

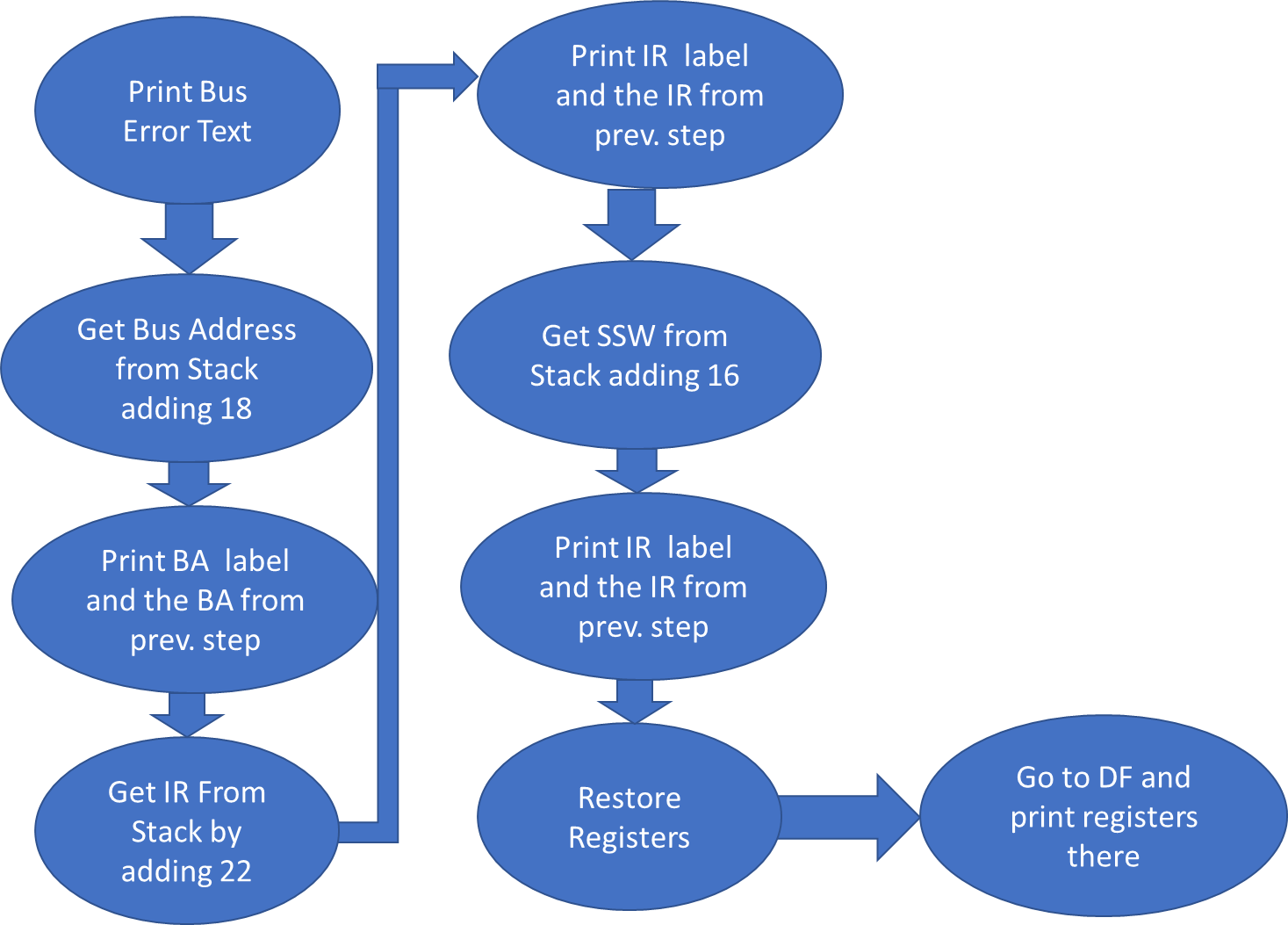
***2.3-) Exception Handlers***

Brief information about Exception Handlers should be given here.

***2.3.1-) Bus Error Exception***

A clear description of this debugger command should be given here.

***2.3.1.1-) Bus Error Flowchart***



***2.3.1.2-) Bus Error Exception Assembly Code***

BUSERRORFUNCTION

;PRINT OUT BERR STRING

MOVEM.L A0-A6/D0-D7,-(SP)

LEA BERRTEXT,A1

MOVE.L #14,D0

TRAP #15

;PRINT BA

LEA BUSADDRESS,A1

MOVE.B #14,D0

TRAP #15

MOVE.L (18,A7),D1

MOVE.B #16,D2

MOVE.B #15,D0

TRAP #15

;PRINT IR

LEA IRTEXT,A1

MOVE.B #14,D0

TRAP #15

CLR.L D1

MOVE.W (22,A7),D1

MOVE.B #16,D2

MOVE.B #15,D0

TRAP #15

;PRINT SSW

LEA SSWTEXT,A1

MOVE.B #14,D0

TRAP #15

CLR.L D1

MOVE.W (16,A7),D1

MOVE.B #16,D2

MOVE.B #15,D0

TRAP #15

;PRINT EMPTY LINE TO END

LEA SPACE,A1

MOVE.B #13,D0

TRAP #15

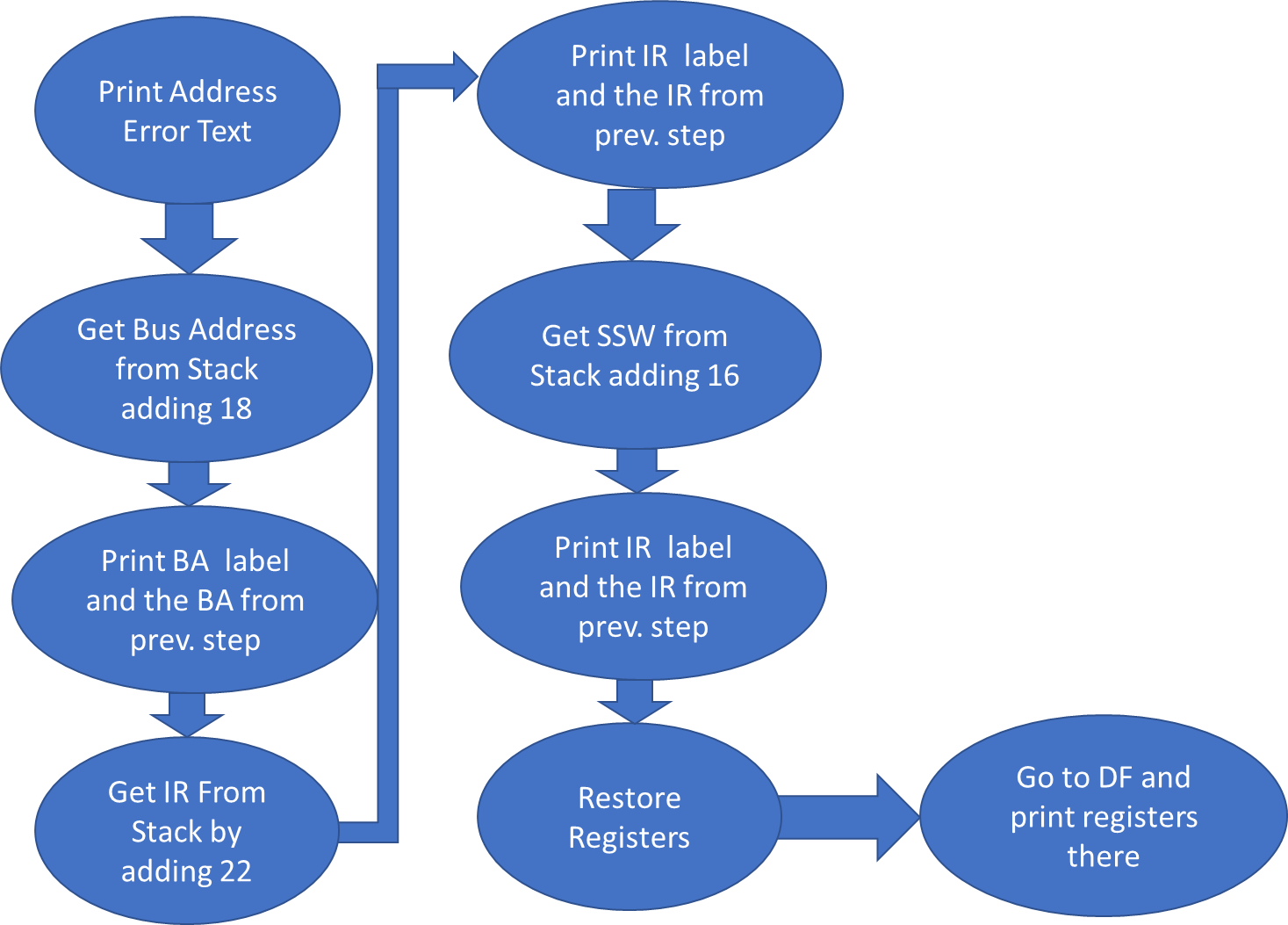
MOVEM.L (SP)+,A0-A6/D0-D7

BRA DFFUNCTION

***2.3.2-) Address Error Exception***

Mention Similarity to Bus Error

***2.3.1.1-) Address Error Exception Flowchart***



It is similar to 2.3.1.1

***2.3.1.2-) Bus Error Exception Assembly Code***

ADDRESSERRORFUNCTION

;PRINT OUT BERR STRING

MOVEM.L A0-A6/D0-D7,-(SP)

LEA ADDRESSERRORTEXT,A1

MOVE.L #13,D0

TRAP #15

;PRINT BA

LEA BUSADDRESS,A1

MOVE.B #14,D0

TRAP #15

MOVE.W (18,A7),D1

MOVE.B #16,D2

MOVE.B #15,D0

TRAP #15

LEA SPACE,A1

MOVE.B #13,D0

TRAP #15

;PRINT IR

LEA IRTEXT,A1

MOVE.B #14,D0

TRAP #15

CLR.L D1

MOVE.W (22,A7),D1

MOVE.B #16,D2

MOVE.B #15,D0

TRAP #15

LEA SPACE,A1

MOVE.B #13,D0

TRAP #15

;PRINT SSW

LEA SSWTEXT,A1

MOVE.B #14,D0

TRAP #15

CLR.L D1

MOVE.W (16,A7),D1

MOVE.B #16,D2

MOVE.B #15,D0

TRAP #15

LEA SPACE,A1

MOVE.B #13,D0

TRAP #15

;PRINT EMPTY LINE TO END

LEA SPACE,A1

MOVE.B #13,D0

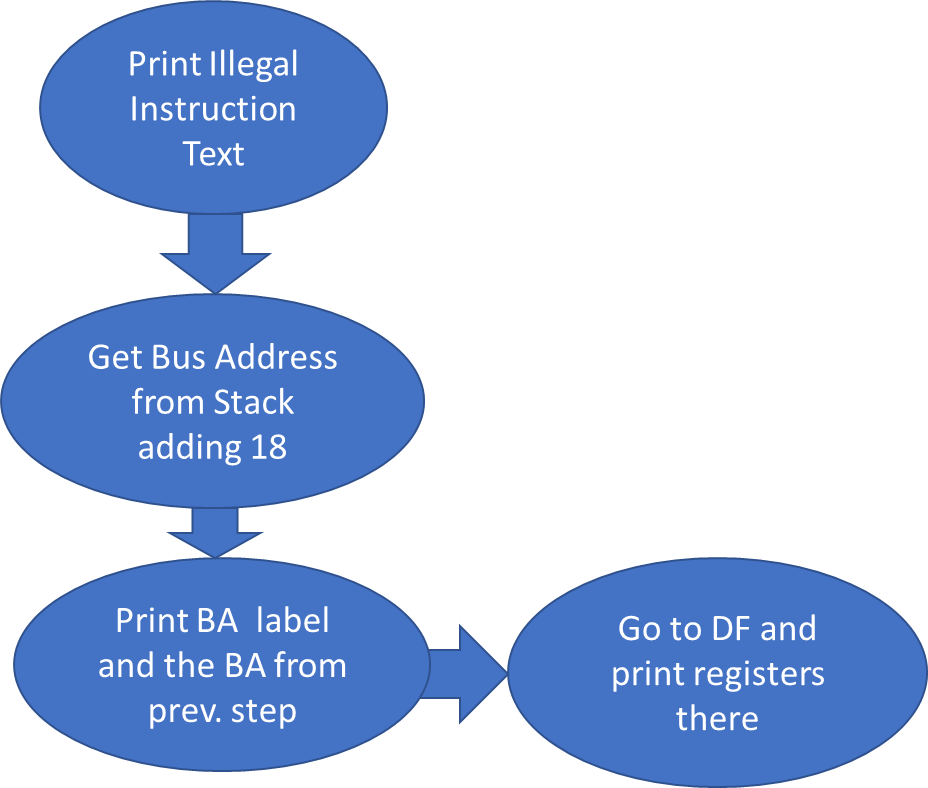
TRAP #15

BRA DFFUNCTION

***2.3.3-) Illegal Instruction Exception***

It is similar to 2.3.1

***2.3.3.1-) Illegal Instruction Exception Algorithm and Flowchart***

It is similar to 2.3.1.1

***2.3.3.2-) Illegal Instruction Exception Assembly Code***

ILLEGALINSTRUCTIONFUNCTION

;PRINT OUT ILLEGAL INSTR STRING

MOVEM.L A0-A6/D0-D7,-(SP)

LEA ILLEGALVECTORTEXT,A1

MOVE.L #13,D0

TRAP #15

;PRINT BA

LEA BUSADDRESS,A1

MOVE.B #14,D0

TRAP #15

MOVE.W (18,A7),D1

MOVE.B #16,D2

MOVE.B #15,D0

TRAP #15

LEA SPACE,A1

MOVE.B #13,D0

TRAP #15

;PRINT EMPTY LINE TO END

LEA SPACE,A1

MOVE.B #13,D0

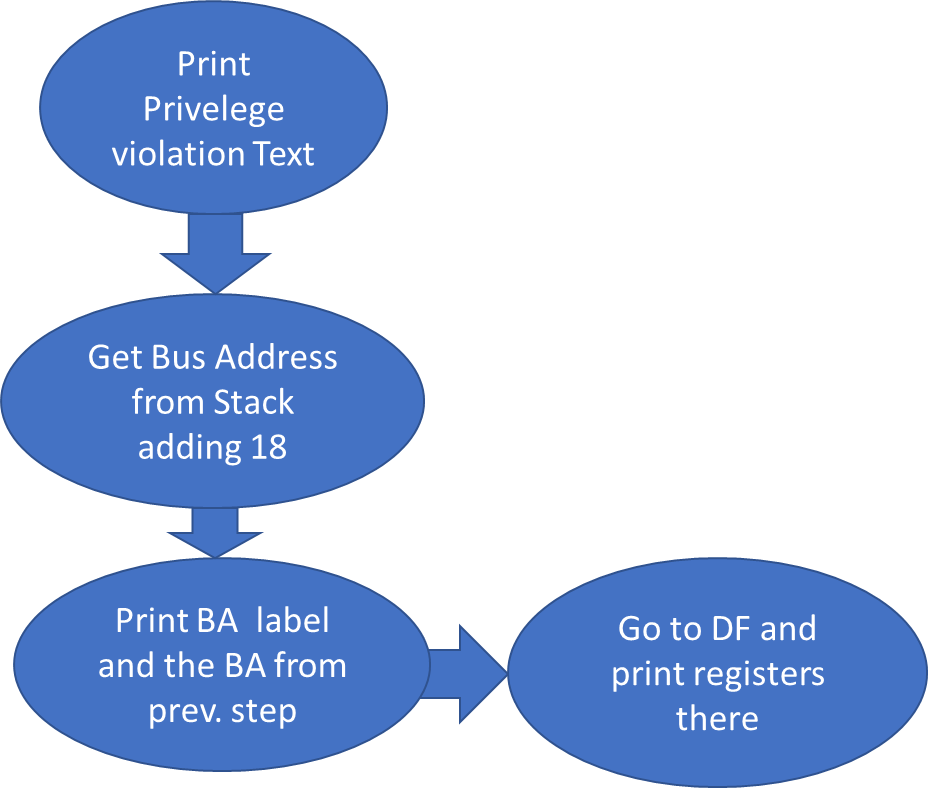
TRAP #15

BRA DFFUNCTION

***2.3.4-) Privilege Violation Exception***

It is similar to 2.3.1

***2.3.4.1-) Privilege Violation Exception Flowchart***

******

***2.3.4.2-) Privilege Violation Exception Assembly Code***

PRIVELEGEVIOLATIONFUNCTION

;PRINT OUT PRIV VIOL STRING

MOVEM.L A0-A6/D0-D7,-(SP)

LEA PRIVELEGEVECTORTEXT,A1

MOVE.L #13,D0

TRAP #15

;PRINT BA

LEA BUSADDRESS,A1

MOVE.B #14,D0

TRAP #15

MOVE.W (18,A7),D1

MOVE.B #16,D2

MOVE.B #15,D0

TRAP #15

LEA SPACE,A1

MOVE.B #13,D0

TRAP #15

;PRINT EMPTY LINE TO END

LEA SPACE,A1

MOVE.B #13,D0

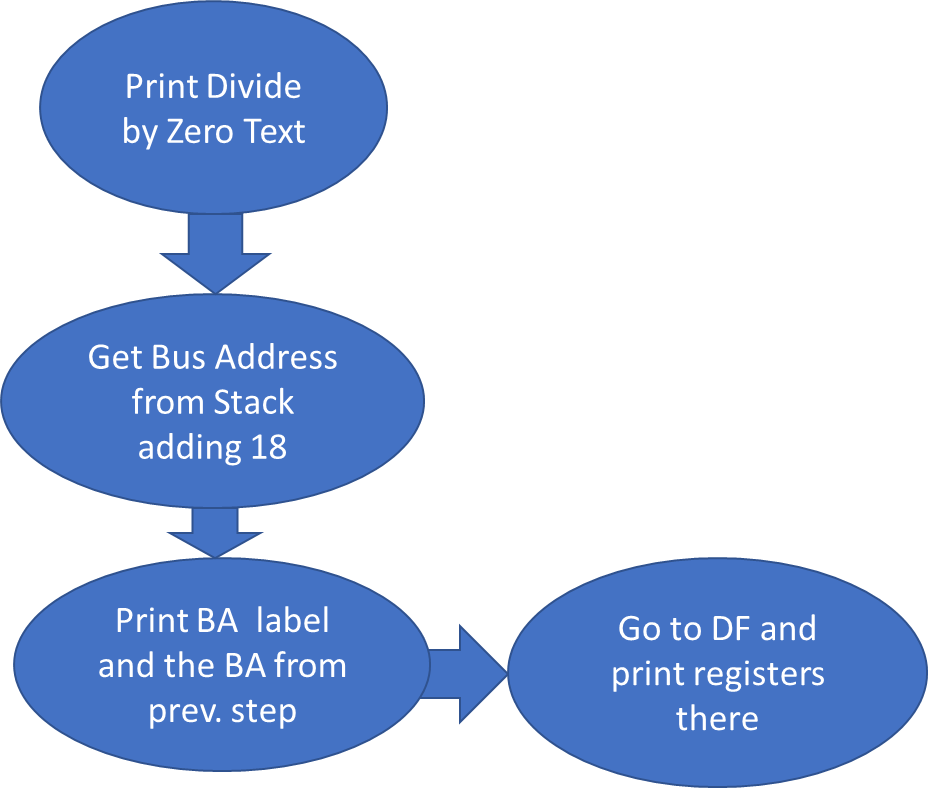
TRAP #15

BRA DFFUNCTION

***2.3.5-) Divide by Zero Exception***

It is similar to 2.3.1

***2.3.5.1-) Divide by Zero Exception Flowchart***

It is similar to 2.3.1.1

***2.3.5.2-) Divide by Zero Exception Assembly Code***

DIVIDEBYZEROFUNCTION

;PRINT OUT DIV BY ZERO STRING

MOVEM.L A0-A6/D0-D7,-(SP)

LEA DIVIDEZEROTEXT,A1

MOVE.L #13,D0

TRAP #15

;PRINT BA

LEA BUSADDRESS,A1

MOVE.B #14,D0

TRAP #15

MOVE.W (18,A7),D1

MOVE.B #16,D2

MOVE.B #15,D0

TRAP #15

LEA SPACE,A1

MOVE.B #13,D0

TRAP #15

;PRINT EMPTY LINE TO END

LEA SPACE,A1

MOVE.B #13,D0

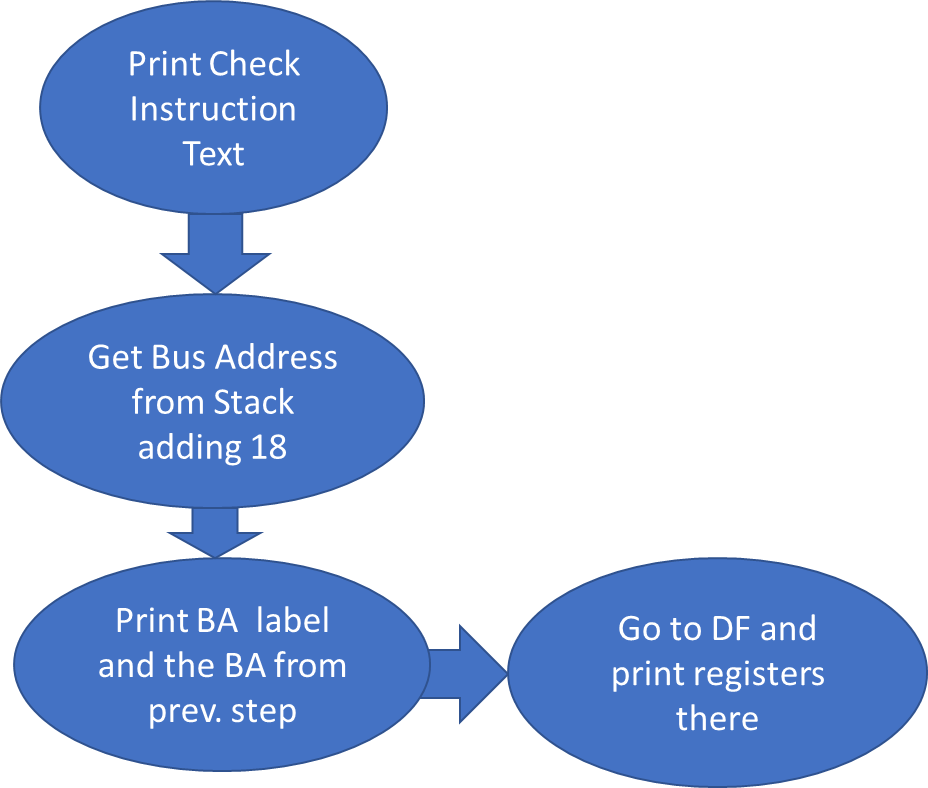
TRAP #15

BRA DFFUNCTION

***2.3.6-)*** ***Check Instruction Exception***

It is similar to 2.3.1

***2.3.6.1-) Check Instruction Exception Flowchart***



***2.3.6.2-) Check Instruction Exception Assembly Code***

CHECKINSTRUCTIONFUNCTION

;PRINT OUT CHECK STRING

MOVEM.L A0-A6/D0-D7,-(SP)

LEA CHECKVECTORTEXT,A1

MOVE.L #13,D0

TRAP #15

;PRINT BA

LEA BUSADDRESS,A1

MOVE.B #14,D0

TRAP #15

MOVE.W (18,A7),D1

MOVE.B #16,D2

MOVE.B #15,D0

TRAP #15

LEA SPACE,A1

MOVE.B #13,D0

TRAP #15

;PRINT EMPTY LINE TO END

LEA SPACE,A1

MOVE.B #13,D0

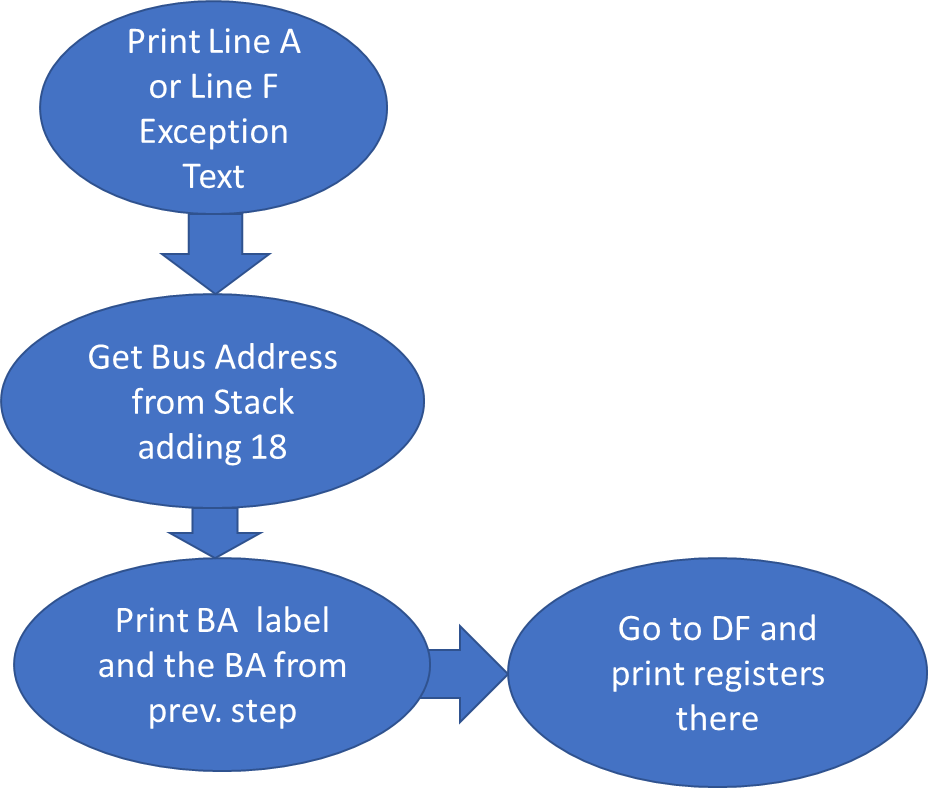
TRAP #15

BRA DFFUNCTION

***2.3.7-) Line A and Line F Emulators***

It is similar to 2.3.1

***2.3.7.1-) Line A and Line F Emulators Flowchart***

It is similar to 2.3.1.1

***2.3.7.2-) Line A and Line F Emulators Assembly Code***

LINEAEMULATORFUNCTION

;PRINT OUT LINEA STRING

MOVEM.L A0-A6/D0-D7,-(SP)

LEA LINEAEMULATORTEXT,A1

MOVE.L #13,D0

TRAP #15

;PRINT BA

LEA BUSADDRESS,A1

MOVE.B #14,D0

TRAP #15

MOVE.W (18,A7),D1

MOVE.B #16,D2

MOVE.B #15,D0

TRAP #15

LEA SPACE,A1

MOVE.B #13,D0

TRAP #15

;PRINT EMPTY LINE TO END

LEA SPACE,A1

MOVE.B #13,D0

TRAP #15

BRA DFFUNCTION

LINEFEMULATORFUNCTION

;PRINT OUT LINEF STRING

MOVEM.L A0-A6/D0-D7,-(SP)

LEA LINEFEMULATORTEXT,A1

MOVE.L #13,D0

TRAP #15

;PRINT BA

LEA BUSADDRESS,A1

MOVE.B #14,D0

TRAP #15

MOVE.W (18,A7),D1

MOVE.B #16,D2

MOVE.B #15,D0

TRAP #15

LEA SPACE,A1

MOVE.B #13,D0

TRAP #15

;PRINT EMPTY LINE TO END

LEA SPACE,A1

MOVE.B #13,D0

TRAP #15

BRA DFFUNCTION

***2.4-) User Instructional Manual Exception Handlers***

Brief information about Instructional Manual Handlers should be given here.

***2.4.1-) Help Menu***

A clear description of this debugger command should be given here

***2.4.1.1-) Algorithm and Flowchart***

An algorithm of the design and its flowchart will be explained here. You may need to include comments for your algorithm.

*Clear //this where things starts*

*Do this m=0 // assign m*

*While m > n // while m > n*

*If m > n //*

*Do this //*

*Else //*

*Do these more //*

*End if //*

*m = m + 1 // increment m by 1*

*finish // finish*

*Figure 2.11. Debugger Command # 1 Algorithm*

It may be necessary to explain more about your flowchart and your design ideas.



*Figure 2.12. Debugger Command # 1 Flowchart*

***2.4.1.2-) Assembly Code***

The assembly code should be written using the algorithm above.

*ORG $1000*

*\*\*\*\*\*\*\*\*\* // Comment goes here*

*\*\*\*\*\*\*\*\*\* // Comment goes here*

*\*\*\*\*\*\*\*\*\* // Comment goes here*

*\*\*\*\*\*\*\*\*\* // Comment goes here*

*\*\*\*\*\*\*\*\*\* // Comment goes here*

*\*\*\*\*\*\*\*\*\* // Comment goes here*

*\*\*\*\*\*\*\*\*\* // Comment goes here*

*\*\*\*\*\*\*\*\*\* // Comment goes here*

*\*\*\*\*\*\*\*\*\* // Comment goes here*

*\*\*\*\*\*\*\*\*\* // Comment goes here*

*END ;*

*Figure 2.13. Debugger Command # 1 Assembly Code*

***3-) Discussion***

Design challenges and discussion about this project should be provided here. You may subdivide this section further and supply figures and table if necessary.

***4-) Feature Suggestions***

You may suggest ideas for expanding this project, such as exception handlers, etc. You may subdivide this section further and supply figures and tables if necessary.

***5-) Conclusion***

The conclusion goes here.[1]

***6-) References***

Supply all references here (books, internet resources, papers, manuals, etc). You need to use square parentheses.

[1] A. Karnik, “Performance of TCP congestion control with rate feedback: TCP/ABR and rate adaptive TCP/IP,” M. Eng. thesis, Indian Institute of Science, Bangalore, India, Jan. 1999.

[2] J. Padhye, V. Firoiu, and D. Towsley, “A stochastic model of TCP Reno congestion avoidance and control,” Univ. of Massachusetts, Amherst, MA, CMPSCI Tech. Rep. 99-02, 1999.

[3] R. E. Sorace, V. S. Reinhardt, and S. A. Vaughn, “High-speed digital-to-RF converter,” U.S. Patent 5 668 842, Sept. 16, 1997.

[4] (2002) The IEEE website. [Online]. Available: <http://www.ieee.org/>

[5] M. Shell. (2002) IEEEtran homepage on CTAN. [Online]. Available: http://www.ctan.org/tex-archive/macros/latex/contrib/supported/IEEEtran/*FLEXChip Signal Processor (MC68175/D)*, Motorola, 1996.

“PDCA12-70 data sheet,” Opto Speed SA, Mezzovico, Switzerland