//Programming Assignment 1

/Name: Aina Azman, NetID: qistina

//Name: Wan Elisa Sofea Wan Sarif, NetID: wansarif

test\_fill: ADDI X1, X1, #5

B fill

fill: ADDI X9, XZR, #0

SUBI X10, X1, #1

fill\_loop: SUBS X11, X1, X9

CBZ X11, fill\_done

LSL X12, X9, #3

ADD X12, X0, X12

SUB X13, X10, X9

STUR X13, [X12, #0]

ADDI X9, X9, #1

B fill\_loop

fill\_done: B insertion\_sort

insertion\_sort: ADDI X19, XZR, #1

insertion\_loop: SUBS X10, X1, X19

CBZ X10, insertion\_done

LSL X11, X19, #3

ADD X11, X0, X11

LDUR X20, [X11, #0]

BL is\_shift

BL is\_insert

B insertion\_done

insertion\_done:

is\_shift: SUBI SP, SP, #64

STUR X14, [SP, #56]

STUR X13, [SP, #48]

STUR X12, [SP, #40]

STUR X11, [SP, #32]

STUR X10, [SP, #24]

STUR X9, [SP, #16]

STUR X20, [SP, #8]

STUR X19, [SP, #0]

LSL X9, X1, #3

ADD X9, X0, X9

LDUR X20, [X9, #0]

SUBI X19, X1, #1

shift\_loop: LSL X10, X19, #3

ADD X10, X0, X10

LDUR X11, [X10, #0]

SUBS X12, X11, X20

SUBIS X13, X19, #-1

ANDS X14, X12, X13

B.EQ shift\_done

STUR X11,[X10, #8]

SUBI X19, X19, #-1

B shift\_loop

shift\_done: ADDI X0, X19, #1

LDUR X19, [SP, #0]

LDUR X20, [SP, #8]

LDUR X9, [SP, #16]

LDUR X10, [SP, #24]

LDUR X11, [SP, #32]

LDUR X12, [SP, #40]

LDUR X13, [SP, #48]

LDUR X14, [SP, #56]

ADDI SP, SP, #64

BR LR

is\_insert: LSL X9, X2, #3

ADD X9, X0, X9

STUR X1, [X9, #0]

insertion\_done: B binary\_search

binary\_search: SUBI SP, SP, #48

STUR X19, [SP, #40]

STUR X9, [SP, #32]

STUR X10, [SP, #24]

STUR X11, [SP, #16]

STUR X12, [SP, #8]

STUR X13, [SP, #0]

binary\_search\_loop: SUB X9, X2, X1

SUBIS X9, X9, #0

B.MI end\_loop\_binary\_search

ADD X10, X2, X1

ADDI X10, X10, #1

ADDI X11, X11, #2

UDIV X19, X10, X11

LSL X12, X19, #3

ADD X12, X0, X12

SUBI SP, SP, #8

STUR X13, [SP, #0]

SUB X13, X3, X12

CBZ X13, confirmEqual\_val

confirmEqual\_val:ADDI X4,X19, #0

LDUR X13, [SP, #0]

ADDI SP, SP, #8

BR LR

SUBS X13, X3, X12

B.MI val\_LESS

ADDI X1, X19, #1

val\_LESS: SUBI X2, X19, #1

end\_loop\_binary\_search:

ADDI X4, XZR, #-1

LDUR X19, [SP, #40]

LDUR X9, [SP, #32]

LDUR X10, [SP, #24]

LDUR X11, [SP, #16]

LDUR X12, [SP, #8]

LDUR X13, [SP, #0]

ADDI SP, SP, #48

BR LR