ECED3403 – Assignment 4

Grace Yu

B00902046

July 19th, 2024

# Testing

### BL branches with link

**Purpose:** Checks for successful implementation of BL instruction.

**Configuration:** The below xme file is loaded into the emulator. It uses BL to branch to another label, returning by restoring the program counter (PC), with the link register (LR).

A screen shot of a computer

Description automatically generated

|  |  |
| --- | --- |
|  |  |

|  |  |
| --- | --- |
| **Expected Results:** | **Actual Results:** |
| The PC should change to the beginning of LOOP, at address 1004. It should then successfully set R0 to 0x00FF before returning to its place in MAIN, at address 1002, when it is restored using LR. |  |

**Pass/Fail:** PASS

### BEQ/BZ

**Purpose:** Checks for successful implementation of BEQ/BZ instruction.

**Configuration:** The following .xme file is loaded into the emulator. It uses the BEQ when the PSW’s zero flag is both set and cleared.

A screen shot of a computer

Description automatically generated

|  |  |
| --- | --- |
| **Expected Results:** | **Actual Results:** |
| * When BEQ is encountered with a PSW Zero flag set, it should branch to the EQUAL label and set R0 to 0x00FF. * It should not execute the BRA DONE instruction immediately after the BEQ, as the PC should change. |  |
| * When BEQ is encountered with a PSW Zero flag cleared, it should not branch to the UNEQUAL label and it should not set R0 to 0x0000. * It should execute the BRA DONE instruction immediately after the BEQ, as the PC should not change. |  |

**Pass/Fail:** PASS

### BNE/BNZ

**Purpose:** Checks for successful implementation of BNE/BNZ instruction.

**Configuration:** The following .xme file is loaded into the emulator. It uses the BNE when the PSW’s zero flag is both set and cleared.

A screenshot of a computer

Description automatically generated

|  |  |
| --- | --- |
| **Expected Results:** | **Actual Results:** |
| * When BNE is encountered with a PSW Zero flag cleared, it should branch to the TRUE label and set R0 to 0x00FF. * It should not execute the BRA DONE instruction immediately after the BNE, as the PC should have changed. | A screenshot of a computer program  Description automatically generated |
| * When BNE is encountered with a PSW Zero flag set, it should not branch to the FALSE label and it should not set R0 to 0x0000. * It should execute the BRA DONE instruction immediately after the BNE, as the PC should not have changed. | A screenshot of a computer program  Description automatically generated |

**Pass/Fail:** PASS

### BC/BHS

**Purpose:** Checks for successful implementation of BC/BHS instruction.

**Configuration:** The following .xme file is loaded into the emulator. It uses the BC when the PSW’s carry flag is both set and cleared.

A screenshot of a computer

Description automatically generated

|  |  |
| --- | --- |
| **Expected Results:** | **Actual Results:** |
| * When BC is encountered with a PSW Carry flag set, it should branch to the TRUE label and set R0 to 0x00FF. * It should not execute the BRA DONE instruction immediately after the BC, as the PC should have changed. |  |
| * When BC is encountered with a PSW Zero flag set, it should not branch to the FALSE label and it should not set R0 to 0x0000. * It should execute the BRA DONE instruction immediately after the BC, as the PC should not have changed. |  |

**Pass/Fail:** PASS

### BNC/BLO

**Purpose:** Checks for successful implementation of BNC/BLO instruction.

**Configuration:** The following .xme file is loaded into the emulator. It uses the BNC when the PSW’s Carry flag is both set and cleared.

A screen shot of a computer

Description automatically generated

|  |  |
| --- | --- |
| **Expected Results:** | **Actual Results:** |
| * When BNC is encountered with a PSW Carry flag cleared, it should branch to the TRUE label and set R0 to 0x00FF. * It should not execute the BRA DONE instruction immediately after the BNC, as the PC should have changed. |  |
| * When BNC is encountered with a PSW Carry flag set, it should not branch to the FALSE label and it should not set R0 to 0x0000. * It should execute the BRA DONE instruction immediately after the BNC, as the PC should not have changed. |  |

**Pass/Fail:** PASS

### BN

**Purpose:** Checks for successful implementation of BN instruction.

**Configuration:** The following .xme file is loaded into the emulator. It uses the BN when the PSW’s Negative flag is both set and cleared.

A screen shot of a computer

Description automatically generated

|  |  |
| --- | --- |
| **Expected Results:** | **Actual Results:** |
| * When BN is encountered with a PSW Negative flag set, it should branch to the TRUE label and set R0 to 0x00FF. * It should not execute the BRA DONE instruction immediately after the BN, as the PC should have changed. |  |
| * When BN is encountered with a PSW Negative flag cleared, it should not branch to the FALSE label and it should not set R0 to 0x0000. * It should execute the BRA DONE instruction immediately after the BN, as the PC should not have changed. |  |

**Pass/Fail:** PASS

### BGE

**Purpose:** Checks for successful implementation of BGE instruction.

**Configuration:** The following .xme file is loaded into the emulator. It uses the BGE when the PSW’s Negative and oVerflow flags are set and cleared

A screen shot of a computer

Description automatically generated

|  |  |
| --- | --- |
| **Expected Results:** | **Actual Results:** |
| * When BGE is encountered with a PSW Negative flag set and oVerflow flag set, it should branch to the TRUE label and set R0 to 0x00FF. * It should not execute the BRA DONE instruction immediately after the BGE, as the PC should have changed. |  |
| * When BGE is encountered with a PSW Negative flag set and oVerflow flag cleared, it should not branch to the FALSE label and it should not set R0 to 0x0000. * It should execute the BRA DONE instruction immediately after the BGE, as the PC should not have changed. |  |

**Pass/Fail:** PASS

### BLT

**Purpose:** Checks for successful implementation of BLT instruction.

**Configuration:** The following .xme file is loaded into the emulator. It uses the BLT when the PSW’s Negative flag and oVerflow flag are set and cleared.

A screen shot of a computer

Description automatically generated

|  |  |
| --- | --- |
| **Expected Results:** | **Actual Results:** |
| * When BLT is encountered with a PSW Negative flag set and oVerflow flag cleared, it should branch to the TRUE label and set R0 to 0x00FF. * It should not execute the BRA DONE instruction immediately after the BLT, as the PC should have changed. |  |
| * When BLT is encountered with a PSW Negative flag set and oVerlow flag set, it should not branch to the FALSE label and it should not set R0 to 0x0000. * It should execute the BRA DONE instruction immediately after the BGE, as the PC should not have changed. |  |

**Pass/Fail:** PASS

### BRA always branches

**Purpose:** Checks for successful implementation of BRA instruction.

**Configuration:** The following .xme file is loaded into the emulator. It uses the BRA instruction to continuously branch to the label DONE, creating a loop.

A screen shot of a computer

Description automatically generated

|  |  |
| --- | --- |
| **Expected Results:** | **Actual Results:** |
| Within LOOP, when the BRA command is encountered it sends the PC back to the beginning of LOOP. |  |

**Pass/Fail:** PASS