



Assignment 1 (3%) Arrays

Deadline: Friday 18 February 2022 at 23:59 on Submittity

Working individually, complete the assignment below. Submit your solution to Submittity (<https://submit.scss.tcd.ie>). By submitting your solution, you are confirming that you have familiarised yourself with College's policy on plagiarism (<https://libguides.tcd.ie/plagiarism>).

Your mark will be the auto-graded mark assigned by Submittity (10 marks).

You are allowed to submit five attempts for the assignment without penalty. Subsequent attempts will attract a 1 mark penalty each, up to a maximum penalty of 5 marks.

Submittity will allow you eight "late days" over the full semester. This means, for example, you can submit one assignment late by eight days or eight assignments late by one day (or part thereof) each, without penalty. Once your "late days" are used up, you will receive zero marks for any late submissions.

Instructions

Write an ARM Assembly Language program that will move an array element from an old index to a new index in an array of word-size values.

The figure below illustrates an array in which an element is moved from old index 6 to new index 3. **Note how the elements between the old and new indices have been moved to fill the "gap" that was left in the array.**

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|--------|--|---|----------|---|----------|----------|---|----------|---|---|---|---|---|---|---|---|---|---|---|
| before | <table><tr><td>7</td><td>2</td><td>5</td><td>9</td><td>1</td><td>3</td><td>2</td><td>3</td><td>4</td></tr><tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr></table> | 7 | 2 | 5 | 9 | 1 | 3 | 2 | 3 | 4 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 7 | 2 | 5 | 9 | 1 | 3 | 2 | 3 | 4 | | | | | | | | | | | |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | | | | | | | | |
| after | <table><tr><td>7</td><td>2</td><td>5</td><td>2</td><td>9</td><td>1</td><td>3</td><td>3</td><td>4</td></tr><tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr></table> | 7 | 2 | 5 | 2 | 9 | 1 | 3 | 3 | 4 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 7 | 2 | 5 | 2 | 9 | 1 | 3 | 3 | 4 | | | | | | | | | | | |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | | | | | | | | |

The start address of the array will be in R0, the old index of the element to move will be in R1 and the destination index to which the element should be moved will be in R2.