Arm assignment 2

Thumb-2 has an instruction- it- used for conditional execution, which executes up to four subsequent instructions. ITE represents to if-then-else construct (T for then, E for else) and ITTEE as if-then-then-else- else. The condition code which follows acts as an argument. If it evaluates to true, then the statements which are ‘then’ would be executed. If not, the ’else’ would be executed. Up to three additional t (then) or e (else) codes can be added to control the execution of the subsequent instructions.

For example,

CMP r1,#25

ITE LT; LT is the argument (signed less than)

ADDLT r1, #02; equivalent to- if (LT) then add

SUBGE r1, #20; equivalent to -else SUB

The argument or condition code given after ITE should be the same as the then statements. The else statements should have the opposite condition code. This check is made by the compiler. And if it is not satisfied, it throws an error. In the above example, the then statement has LT which is the argument of ITE and the else(sub) statement has GE which is the opposite.

So in the code 2 of assignment, the then statements has the argument LT which is same as that of ITE argument and the else statement has the argument GE which is opposite of LT. But in the code 1 this is not followed which is why it throws error.

Few arguments which are opposites are:

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| --- | --- | --- | --- | --- |
| eq | Equal. |  | ne | Not equal. |
| hs (or cs) | Unsigned higher or same (or carry set). | lo (or cc) | Unsigned lower (or carry clear). |
| mi | Negative. | pl | Positive or zero. |
| vs | Signed overflow. | vc | No signed overflow. |
| hi | Unsigned higher. | ls | Unsigned lower or same. |
| ge | Signed greater than or equal. | lt | Signed less than. |
| gt | Signed greater than. | le | Signed less than or equal. |

References: https://community.arm.com/processors/b/blog/posts/condition-codes-3-conditional-execution-in-thumb-2