Lab3 Report

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1 Purpose

The purpose of the program is to implement strcmp() function in Language C
Anticipated outcomes:

2 Principles

2.1 Overview

The program compares two strings by conparing the ASCII value of each character. The starting address of string(i.e. x3100 or x3200) is read into R0 or R1. Then use LDR to read the data in the address and store the ASCII values respectively in R3 and R4. If the values are the same, increment R0 and R1, then repeat the process until NULL or different ASCII values appear.

2.2 How to compare

After getting the ASCII values of two characters, check if both values are 0(i.e. NULL). If yes, return zero.

Then perform substraction. If the result is not zero, return the result, otherwise increment the registers R0 and R1.

Relevant code:

```
1  LOOP     LDR      R3, R0, #0    ;Load a character in S1 into R3
2           LDR      R4, R1, #0    ;Load a character in S2 into R4
3           ADD      R5, R3, R4    ;If both are NULL, return #0
4           BRz      RETURN_NULL
5           AND      R5, R5, #0    ;Clear R5
6           NOT      R4, R4
7           ADD      R4, R4, #1
8           ADD      R2, R3, R4    ;R3-R4
9           BRnp     RETURN
10          ADD      R0, R0, #1
11          ADD      R1, R1, #1    ;Check the next character
12          BRnzp    LOOP
```

3 Procedure

3.1 Bugs encountered

1. When reading data from R0 and R1, I wrongly used LD, whose second operand cannot be a register.

   Solution: Use LDR instead.

4 Results

Results are shown below:

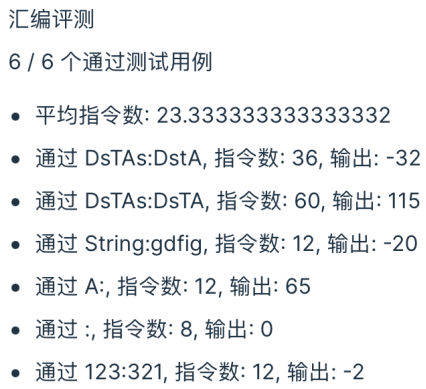

Figure 1: Result

The program correctly compares various kinds of strings.