

Practical 4

Again, you have a template which you should use.

You must submit a Makefile along with your code. It should be called 'Makefile' and must have no file extension. Running 'make' in your submission directory must produce an .elf file. Do not add a rule in your makefile to run gdb. This would cause your makefile to never finish.

Part 1: (1)

A block of data is provided in the template.

Copy that data from flash to the start of RAM.

Once the automarker hits the label 'copy_to_RAM_done' it will verify and modify the contents of RAM.

This is very similar to last week, except you won't be using the stack, you'll maintain your own destination pointer which must be initialised to the start of RAM.

Also, it's important that you don't hard-code a fixed number of loop iterations in your copy loop.

Part 2: (2)

Iterate through each byte of the data in RAM and find the closest pair when treated as signed numbers.

Let the smaller element of the pair be A and the larger element be B.

Once found, push A to the stack then push B to the stack.

This needs to be done when the program hits the label 'closest_pair_finding_done'

The automarker will verify that these values are stacked.

Hint: use the stack as your working space. In other words, update the stack as soon as a better A and B are found.

Part 3: (1)

Your main loop should do the following:

```
    Display A
    Delay for 1.5 seconds
    Display B
    Delay for 1.5 seconds
loop
```

You should use a delay subroutine to implement the delay.

Part 4: (2)

If SW0 is held down, rather than a fixed delay between A and B, make the delay variable based on POT0.

When the pot is rotated fully anticlockwise, the delay should be 0.2 seconds.

When fully clockwise, 1 seconds

Linear in between.

Part 5: (2)

Instead of the delay being dependant on only POT0, sample both POT0 and POT1 at the start of the delay routine and use whichever pot will result in the longer delay.

Bonus: (1)

When SW1 is held, display the temperature as measured by the TC74A0 on LEDs.

The value on the LEDs should correspond to the temperature in degrees celsius.

Marked out of: 8

Available marks: 9