EE 306 – 17 Feb 2020

Copy text from one memory location to another.

The first byte of the text is stored in a memory location **`TEXT_START`.** The last character of the text is a "*carriage return*". Copy the text to a new location starting with **`NEW_TEXT_START`** until the carriage return. C*arriage return* is represented with **`0A`** in ASCII.

1. Draw a conceptual image of memory. Indicate important locations and data.
2. Decide which information is kept by which register. Initialize the registers.
3. Write a **`LOOP`** to read and write memory data byte by byte.
4. Use a smart addressing mode. Do not waste your budget with dedicating one instruction solely to update the address.

Addition of the numbers

Assume some of the characters in the copied text represents numbers in the range of 0-9. Modify the program to add up those numbers.

Flags

Name them. Determine the flag values after these operations:

$$\begin{array}{r} \text{7B000000} \\ +\ \text{30000000} \\ \hline \end{array} \qquad \begin{array}{r} \text{FFFFFFFF} \\ +\ \text{FFFFFFFE} \\ \hline \end{array} \qquad \begin{array}{r} \text{A1234567} \\ +\ \text{B0000000} \\ \hline \end{array}$$

Correlation

Calculate the cross correlation of SignalA and and SignalB. Both of these signals have N samples.

$$C = \sum_{i=0}^{N-1} A_i \times B_i$$

Grader

1. Calculate the weighted average of 10 students:

$$WA = 0.5 \times \frac{\sum_{i=1}^{4} HW_i}{4} + 0.5 \times Final$$

2. Give letter grades according to the following ruler:

WA>=90 → **A**, 89>WA>=80 → **B** 79>WA>=70 → **C** 69>WA>=60 → **D**, else **F**.

ADDRESS	Content
HW1S1	32 bit
HW2S1	32 bit
HW3S1	32 bit
HW4S1	32 bit
Final1	32 bit
HW1S2	32 bit
HW2S2	32 bit
HW3S2	32 bit
HW4S2	32 bit
Final2	32 bit
.....	32 bit
	32 bit
	32 bit
Final10	32 bit

Count cars in a parking lot

When a car enters/exits a parking lot, it triggers a hardware sensor. The sensor changes the content of memory location **`SENSOR`**. Direction of the car is written in location **`INFO`**. Write a program that keeps the number of cars in R0.

`EXIT: 0x45_58_49_54    ENTE: 0x45_4E_54_45`

Bonus: Compare two signed numbers.