Homework 6 Question: Getting a number from key hits

A user enters the command S$12AB, for example. I saved the keys to a memory Locations: $3000 for $31, $3001 for $32, $3002 for $41, $3003 for $42, and $3004 for $0D. How you can you put the number $12AB into the X register so that I can use LDAA 0,X instruction.

Answer:

Take one number at a time starting from $3000. For each number, do the following:

1. Subtract ASCII bias. So now X=$1.
2. Check the next digit. If not the ENTER key, do
3. Multiply X by 16 ($10). So now X=$10.
4. Take the next key and subtract the ASCII bias.
5. Add it to X. So now X=$12.
6. Go to step 2 above and repeat until the ENTER key.

Homework 6 Question: Printing a number to terminal in decimal and hexa-decimal

I am attempting to print out the decimal values of the byte we extract from a memory address with 'S$4000' for example. Every time I try to get decimal, I have an issue with breaking up the hex parts into decimal since you would have to expand to more bits than you previously had (i.e. '$7F' -> '127').
I don't see how you can isolate the 1,2,7 in this example, when $70 becomes 112 and $F becomes 15, I can't figure out how to get 1,2,7 from this.

Answer:

If you want to print decimal number of $7F,
keep divide the number by 10 ($A) and save the remainders.

If you want to print hexa-decimal number of $7F,
keep divide the number by 16 ($10) and save the remainders.

Then print the remainders in reverse order (with ASCII bias).

Homework 6 Question: Getting a number from key hits in hexa-decimal and decimal

I'm stuck on write. When the user types in: W$3004 21 (this is just an example); I'm able to grab the address that the user types in fine, but the decimal, 21 that they enter confuses me.

Yes, I'm able to grab character-by-character, so each of the ASCII values $32 and $31, and then I convert them to regular Hex by subtracting $30. I then grab the two new values $2 and $1, left shift $2 four times to make $20 and then add $1 to get $21...

The problem is it's in HEX, so when I go to divide 16 to get the hex values it's already in HEX, so I get the wrong answer. When the user enters 21 initially, we need to store its hex equivalent aka 15 base 16 in memory correct? If that's the case, how do we do that then? I made 21.... in hex but not in decimal. How do I do that and get $1F as the final result?

Answer:

For the case of W$3004 $21
1. separate the two new values $2 and $1
2. multiply $2 by 16 (its weight, $10) => $20
3. multiply $1 by 1 (its weight)
4. add the two results
5. save the sum to $3004

For the case of W$3004 21
1. separate the two new values $2 and $1
2. multiply $2 by 10 (its weight, $A) => $14
3. multiply $1 by 1 (its weight)
4. add the two results
5. save the sum to $3004