CSUS, CSC 35, Fall 2016, Dr. Ghansah

ALGORITHM FOR CONVERTING A BINARY NUMBER (eg. IN A REGISTER OR MEMORY) INTO ASCII DIGITS FOR PRINTING ON SCREEN

In general, the algorithm for converting a number in one base into a new base is repeatedly divide the number by the new base and writing down the remainders (which will be the digits). The answer is the remainder in reverse order (this was the first week lecture). Now for this lab we need to convert to the new base of 10 (decimal). Here is the algorithm for converting to Decimal

1. Set a counter to zero.
2. Get number into the dividend registers for proper size.
3. Divide the dividend by the 16 bit divisor of 10.
4. Add ASCII value of 0x30 to the remainder digit. This is how to convert to ASCII
5. Save remainder digit on stack. (use PUSH instruction)
6. Add to counter of digits saved on stack
7. Zero out remainder register.
8. Test the quotient (next dividend) to see if its zero.
9. No then go to step 3
10. Yes print the digits from the stack one by one. (Use POP operation and Output char system call.)

The algorithm for converting the number to Hex is similar except that we divide by 16 and we also check for letters ( for numbers 10 or more).