

## Project 2: Hexadecimal to Octal Conversion

**Due: Thursday September 26, 2002**

### Objective

The objective of this programming project is to practice designing your own loops and branching code in assembly language and to gain greater familiarity with the i386 instructions set.

### Assignment

Write an assembly language program that prompts the user to enter a string to be interpreted as a number in base 16. Your program must convert the ASCII string representation of this hexadecimal number into a 32-bit unsigned binary number. Finally, your program must prepare and store an ASCII string for the octal (base 8) representation of the same number and print it out.

Your program should generate an error if the input string contains a character that is not 0 through 9 or A through F (except for the linefeed at the end). You may disallow lower case 'a' through 'f' in the hexadecimal representation. You may also assume that any input string with more than 9 characters (including the linefeed) is invalid.

### Example:

```
Enter hex digits: 2345ABCD
Original: 2345ABCD
Octal: 04321325715
```

### Implementation Issues:

1. The user input has a linefeed character at the end. You do not want to consider this character when you convert from a hexadecimal string to binary.
2. It is OK to print out extra leading zeroes for the octal representation of the number.
3. You will find the shift left and shift right instructions SHL and SHR especially useful.
4. Note that the character 'A' does not follow the digit '9' in ASCII. Remember this when you convert the hex string to binary.

### Turning in your program

Use the UNIX script command to record some sample runs of your program. You should use inputs that result in a variety of octal string outputs and also inputs that demonstrate the error checking features of your program.

You should submit two files: 1) your assembly language program and 2) a typescript file of your sample runs. The class name for submit is 'cs313-0101' and the assignment name is 'proj2'. The UNIX command to do this should look something like:

```
submit cs313-0101 proj2 hex2oct.asm typescript
```