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Assignment 3
CS 10

1. Define four symbolic constants that represent integer 25 in decimal, binary, octal, and hexadecimal formats.

- Decimal 25 = $(25)_{10}$
  - Converting integer into decimal, the base goes to 10.
- Binary 25 = $(11001)_2$
  - Converting integer to binary we divide 25 by 2 and save the remainders, we will get 11001. The base is 2.
- Octal 25 = $(31)_8$
  - Converting integer to octal, we divide 25 by 8 and save the remainders. We will get 3 and remainder is 1. Becomes 31 and base is 8.
- Hexadecimal 25 = $(19)_{16}$
  - Converting integer into hexadecimal, we divide 25 by 19 and save the remainders, we will get 1 and remainder is 9. The base will be 16.

3. Create a data definition for a doubleword that stored it in memory in big endian format.

The syntax for data definition is [name] directive initializer [,initializer] . . .

Big endian is from high to low.

For example if I have doubleword 11223344h.

var DWORD 11223344h

BYTE 44h,33h,22h,11h (will be stored in a array of bytes)

5. Write a program that contains two instructions: (1) add the number 5 to the EAX register, and (2) add 5 to the EDX register. Generate a listing file and examine the machine code generated by the assembler. What differences, if any, did you find between the two instructions?

```
.data
.code
main proc
        add eax,5
        add edx,5
invoke EXITPROCESS,0
main ENDP
END MAIN
```

The differences between the two instructions is the opcodes.

7. Declare an array of 120 uninitialized unsigned doubleword values.

```
theArray DWORD 120 DUP(?)
```

9. Declare a 32-bit signed integer variable and initialize it with the smallest possible negative decimal value. (Hint: Refer to integer ranges in Chapter 1 .)

```
smallestVal SDWORD -2147483648
```

11. Declare a string variable containing the name of your favorite color. Initialize it as a null terminated string.

```
favCol BYTE "tosca",0
```

13. Declare a string variable containing the word "TEST" repeated 500 times.

```
Repeat BYTE 500 DUP("TEST")
```

15. Show the order of individual bytes in memory (lowest to highest) for the following double-word variable:

```
val1 DWORD 87654321h
```

BYTE 21h,43h,65h,87h