*The only way to learn a new programming language is by writing programs in it.*
*~ Dennis Ritchie*

# Assembly Programming Tutorial

*A quick guide to Assembly programming with NASM*

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# 1. INTRODUCTION

Assembly language is the low level programming language for different classes of processors. It is processor architecture dependent and, thus may vary from processor to process. In this tutorial, however, we will consider i386 class of processors (so called IA-32) which is the 32 bit version of x86 instruction set architecture.

# 2. INSTALLING NASM

As we prefer using Linux for the computer science students, let us see how to set up NASM for different Linux flavours.

## 2.1 INSTALLING UNDER UBUNTU

Run the following commands in Ubuntu bash shell to install required libraries:

1. **sudo apt-get install *nasm***

You may be asked for super user password; type it and press enter to continue with the installation. Make sure that you have the password, otherwise you will not be able to install the package.

In case you have a 64 bit Ubuntu installed in your system, run the following commands in addition to the previous one:

2. **sudo apt-get update**

You may have to wait until package manager updates the package repositories for the latest package information.

3. **sudo apt-get install *libc6-dev-i386***

# 3. RUNNUNG YOUR FIRST PROGRAM

After you successfully set up the environment for programming in NASM, let us write our first assembly program and test the set-up by running the program. The steps for doing so, are as follows:

1. Create a file with the extension ***.asm*** (you can use **gedit *<file name>*** for file creation)

2. Write your assembly program in the file and save it

3. Compile your program using following command: **nasm -f elf32 *<file name>.asm***

   Or: **nasm -f elf32 -o *<file name>.o* *<file name>.asm***

   This will create object file of your program with the extension ***.o***

4. Create executable file of your program using the following command:

   **gcc -m32 -o *<file name>* *<file name>.o***

5. Run the program using: ***./<file name>***

## REFERENCES


1. Netwide Assembler (NASM): *http://www.nasm.us/*