



## COMSATS University Islamabad, Wah Campus Department of Computer Science

### LAB MANUAL - I

Class/Program: BCS & MCS

Course: MPAL/COAL

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Introduction to Assembly language, compare it with C/C++, learn its program structure and template, understand numeric variables, explore the AX register and MOV/CALL commands, write our first code to print a variable, use built-in functions like WRITEDEC, and get introduced to the programming tool.

#### Objectives:

Following are the objectives of this lab session.

1. Introduction to Assembly Language
2. Comparison of Assembly language with C/C++
3. Program structure and Program Template for Assembly Language
4. Introduction to Numeric variables and its types
5. Introduction to ax register, its usage and its sizes
6. Introduction to MOV and Call Command
7. First Code how to declare and print a numeric variable
8. Use of built-in function WRITEDEC, CLRSCR
9. Introduction to the Tool used for Assembly Programming

#### Introduction to Assembly Language:

An assembly (or assembler) language, often abbreviated asm, is a low-level programming language for a computer, or other programmable device, in which there is a very strong (generally one-to-one) correspondence between the language and the architecture's machine code instructions. Each assembly language is specific to a particular computer architecture, in contrast to most high-level programming languages, which are generally portable across multiple architectures, but require interpreting or compiling. Assembly language may also be called symbolic machine code.

Assembly language uses a mnemonic to represent each low-level machine instruction or operation, typically also each architectural register, flag, etc. Many operations require one or more operands in order to form a complete instruction and most assemblers can take expressions of numbers and named constants as well as registers and labels as operands, freeing the programmer from tedious repetitive calculations. Depending on the architecture, these elements may also be combined for specific instructions or addressing modes using offsets or other data as well as fixed addresses. Many assemblers offer additional mechanisms to facilitate program development, to control the assembly process, and to aid debugging.

Assembly language is converted into executable machine code by a utility program referred to as an assembler. The conversion process is referred to as assembly, or assembling the source code. Assembly time is the computational step where an assembler is run.

#### Comparison between Assembly and C/C++:

# Assembly Language C Program Lab Manual

**JA Banks**



## **Assembly Language C Program Lab Manual:**

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