**Assignment #1**

**2.1 Describe the process of translating a program written in a High-Level Language (HLL), e.g. C++, into an executable file that is ready for execution. Identify the system programs used in the process and describe the role of each of them assuming that the compiler generates an assembly language file as the output.**

A program written in High-level Language is first processed by compiler to produce the corresponding program in assembly language, then, the program is processed by assembler to produce binary instruction (object file(s)), then, multiple object files are combined with library files by linker to produce executable file.

System programs used:

1. Complier – translate from High – Level Language to assembly language
2. Assembler – translate from assembly language to binary instruction (object file(s))

**What is the system program used by the Operating System (OS) to load an executable file to memory and run it?**

The system program, loader, is used by OS to load an executable file to memory and run it.

**2.2 Describe the elements, including optional ones, of a MIPS assembly language statement.**

1. Label: A symbol string associated with a specific memory address

2. Operations:

a) assembler directive: tells assembler how to translate a program

b) Machine instruction

3. Operands:

a) Register names: the name of the register associated with current instruction

b) Immediate value: data that is stored as part of instruction itself instead of being in a memory location or a register

c) Address label: the label that is associated with current instruction

4. Comments: text string from # symbol to end of line, ignored by assembler.