Introduction of Lecturer

Designation, Office Details

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Introduction To Compiler

Course Code: CSC 3220 Course Title: Compiler Design

Dept. of Computer Science
Faculty of Science and Technology

Lecturer No:		**Week No:**	**1**	**Semester:**	**Summer**
Lecturer:	*Md Masum Billah; billah.masumcu@aiub.edu* *https://masum-billah.net*				

Introduction of Lecturer

Educational Background

- **M.Sc. in Computer Engineering**

Major: Embedded Systems

University of Duisburg-Essen, Germany

- **B.Sc. in Computer Science & Engineering**

University of Chittagong

Introduction of Lecturer

Research Interests

- IoT
- Machine Learning
- Data Science
- Deep Learning

Lecture Outline

1. Vision, Mission, Quality Policy, and Goals of AIUB
2. Vision and Mission of Computer Science Department
3. Course Evaluation
4. Objective of this Course
5. Basic things of a Compiler
6. Language Processors

Vision

AMERICAN INTERNATIONAL UNIVERSITY-BANGLADESH (AIUB) envisions promoting professionals and excellent leadership catering to the technological progress and development needs of the country.

Mission

AMERICAN INTERNATIONAL UNIVERSITY-BANGLADESH (AIUB) is committed to provide quality and excellent computer-based academic programs responsive to the emerging challenges of the time. It is dedicated to nurture and produce competent world class professional imbued with strong sense of ethical values ready to face the competitive world of arts, business, science, social science and technology.

Quality Policy

"Quality shall be adhered to in conformity with the prescribed national and international standards of quality and excellence including those provided by the professional bodies and organizations. The American International University- Bangladesh is committed to translate into actions the programs, projects and activities related to the sustainable delivery of quality management operation system. The students being the valued customers are the central focus of the university shall be provided with utmost care and attention to meet their primordial needs and future career success. In view of this commitment, the university shall exert best efforts to harmonize its action through collaboration, cooperation and consultation with every unit and components of the university."

Goals

- Sustain development and progress of the university
- Continue to upgrade educational services and facilities responsive of the demands for change and needs of the society
- Inculcate professional culture among management, faculty and personnel in the attainment of the institution's vision, mission and goals
- Enhance research consciousness in discovering new dimensions for curriculum development and enrichment
- Implement meaningful and relevant community outreach programs reflective of the available resources and expertise of the university
- Establish strong networking of programs, sharing of resources and expertise with local and international educational institutions and organizations
- Accelerate the participation of alumni, students and professionals in the implementation of educational programs and development of projects designed to expand and improve global academic standards

Vision of Computer Science Department

Our vision is to be the preeminent Department of Computer Science through creating recognized professionals who will provide innovative solutions by leveraging contemporary research methods and development techniques of computing that is in line with the national and global context.

Mission of Computer Science Department

The mission of the Department of Computer Science of AIUB is to educate students in a student-centric dynamic learning environment; to provide advanced facilities for conducting innovative research and development to meet the challenges of the modern era of computing, and to motivate them towards a life-long learning process.

Course Evaluation

Mid-Term Evaluation

- Attendance : 10%
- Quizzes : 30%
- Lab Performance : 20%
- Term Exam : 40%

Course Evaluation

Final Term Evaluation

- Attendance : 10%
- Quizzes : 30%
- Lab performance : 20%
- Final Term : 40%
- **Grand Final = 40% of Midterm + 60% of Final Term**

Objectives and Outcomes

Objectives:

- Understand the objective of this Course
- Understand the basic concept of a compiler

Outcomes:

- Students should be able to understand the importance of a compiler
- Students will analyze the language Processors.

Basic things of a Compiler

1. What is a Compiler?
2. Why do we need a compiler?
3. Why study compilers?

Basic things of a Compiler

Compilers Construction touches many topics in Computer Science

1. Theory
   - Finite State Automata, Grammars and Parsing, data-flow
2. Algorithms
   - Graph manipulation, dynamic programming
3. Data structures
   - Symbol tables, abstract syntax trees
4. Software Engineering
   - Software development environments, debugging
5. Artificial Intelligence
   - Heuristic based search

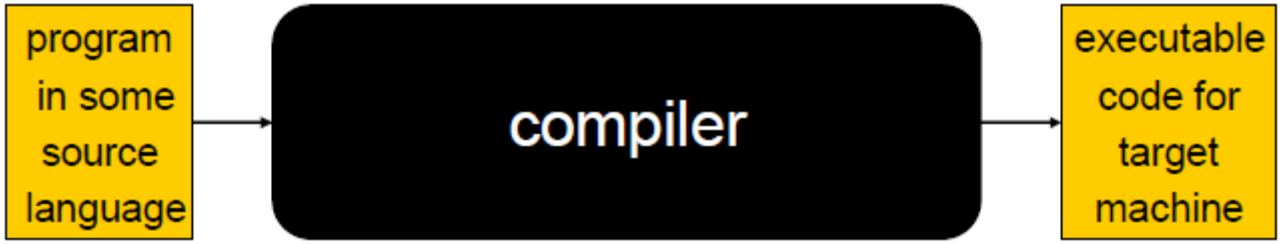
Language processors

Some common language processors are:

1. Compiler
2. Interpreter
3. Preprocessor
4. Assembler

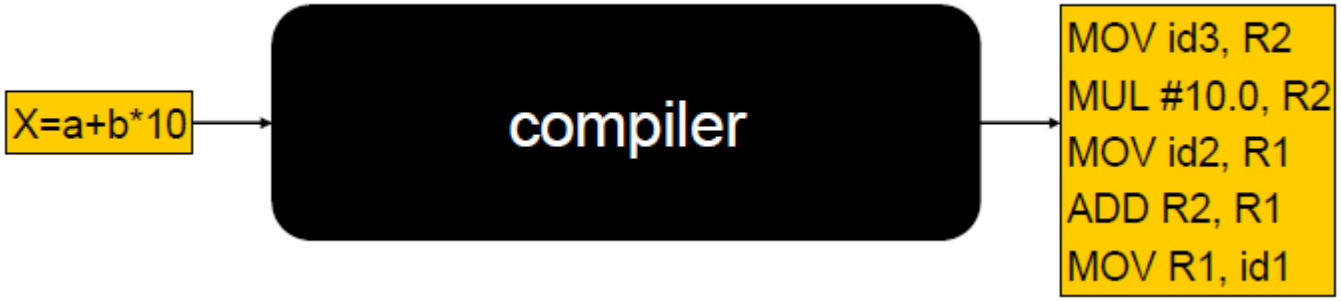
Compiler

A compiler is a program that reads a program written in one language and translates it into another language.



Traditionally, compilers go from high-level languages to low-level languages.

Example


X=a+b*10
compiler
MOV id3, R2
MUL #10.0, R2
MOV id2, R1
ADD R2, R1
MOV R1, id1

Interpreter

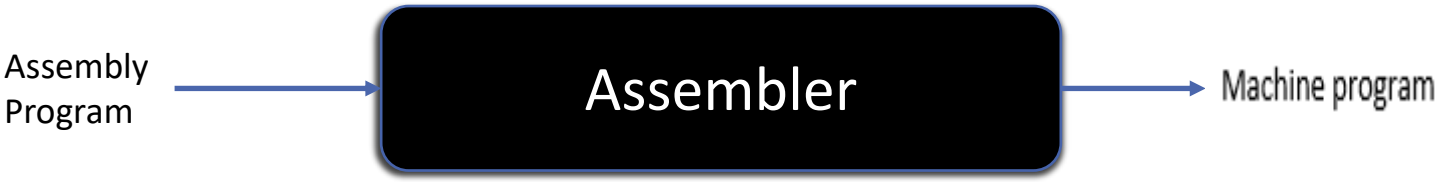
An interpreter is another common kind of language processor. Instead of producing a target program as a translation, an interpreter appears to directly execute the operations specified in the source program on inputs supplied by the user.

Preprocessor

Preprocessing performs (usually simple) operations on the source file(s) prior to compilation.

Assembler

An Assembler is a translator that translates Assembly language to machine code. So, an assembler is a type of a compiler and the source code is written in Assembly language.



Differences between Compiler and Interpreter

Compiler	Interpreter
Compiler takes whole program as input.	Interpreter takes single instruction as input.
Intermediate Object code is generated.	No Intermediate Object Code is Generated
Memory Requirement: More	Memory Requirement is Less
Program need not be compiled every time .	Every time higher level program Is converted into lower level program.

Lecture References

A. Aho, R. Sethi and J. Ullman, ***Compilers: Principles, Techniques and Tools*** *(*The Dragon Book*)*, [Second Edition]

References

1. A. Aho, R. Sethi and J. Ullman, ***Compilers: Principles, Techniques and Tools(***The Dragon Book*)*, [Second Edition]

2. **Principles of Compiler Design** (2nd Revised Edition 2009) A. A. Puntambekar

3. Basics of Compiler Design Torben Mogensen