



SCJ 1013: PROGRAMMING TECHNIQUE 1: C++ SECTION 01

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Lecturer's Details

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Course Outline

- Download from: <http://elearning.utm.my>
- Course Learning Outcomes:
 - Solve problems systematically using problem solving methods.
 - Construct a C++ program correctly from the analyzed problems using structured approach.
 - Construct or develop complete C++ programs for simple to moderate problems individually.
 - Solve problems in a given time frame using C++ programming language and tools.

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Reference Books

- Main Text:
 - Tony Gaddis, Barret Krupnow, *Starting out with C++*, 6th edition update. 2009. Pearson Addison-Wesley. (Brief Version)
 - Price: RM75
- Lab Module:
 - Faculty of Computer Science and Information Systems, *Programming Technique I – C++ Workbook (English – Malay)*, 4th. edition, 2010.
 - Price: RM20

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Grading				
No.	Assessment	Number	% each	% total
1	Assignments	3	8.33%	25
2	Quizzes	2	5%	10
3	Lab Exercises	2	2.5%	5
4	Skill-Based Test	2	2.5%	5
5	Problem solving test	1	5%	5
6	Mid-Semester Exam	1	20%	20
7	Final Exam	1	30%	30
Overall Total				100

UTM Grade System		
Grade	Point	Marks
A+	4.00	90-100
A	4.00	80-89
A-	3.67	75-79
B+	3.33	70-74
B	3.00	65-69
B-	2.67	60-64
C+	2.33	55-59
C	2.00	50-54
C-	1.67	45-49
D+	1.33	40-44
D	1.00	35-39
D-	0.67	30-34
E	0.00	00-29



Important Dates

- Problem Solving Test (5%)
 - Date: 4/8/2010
 - Day: Wednesday
 - Time: 2.30-3.30p.m
 - Venue: BK5, N28.
- Mid-Semester Exam (20%)
 - Date: 28/8/2010
 - Day: Saturday
 - Time: 9 – 11 a.m
 - Venue: BK5, N28

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UTM Attendance Policy

- To be allowed to sit for final exam, a student must have an attendance **more than 80%**.
- First warning letter will be issued for the first 4 hours not attending the class.
- Second warning letter for the subsequent 4 hours.
- Letter to forbid seating for final exam will be issued for the subsequent 3 hours.

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E-Learning Session

- Go to: <http://elearning.utm.my>
- Log in to your account:
 - Username: Your Student ID Number
 - Password: Your IC Number
- Go to SCJ1013.

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INTRODUCTION TO COMPUTERS & PROGRAMMING

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What is a computer?

- Machine that processes data to produce a desired output.
- Programmable machine designed to follow instructions

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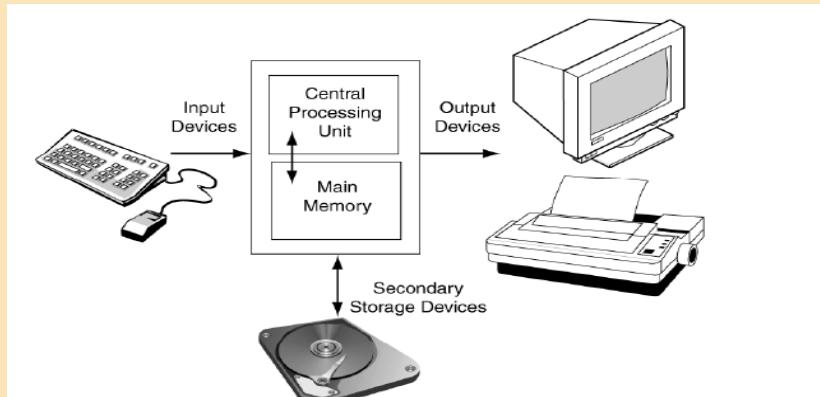
What is a computer program?

- The instructions required to achieve a desired end result.
- Instructions in computer memory to make it do something.
- A computer program is a set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result.
- Examples of computer program or computer application?????

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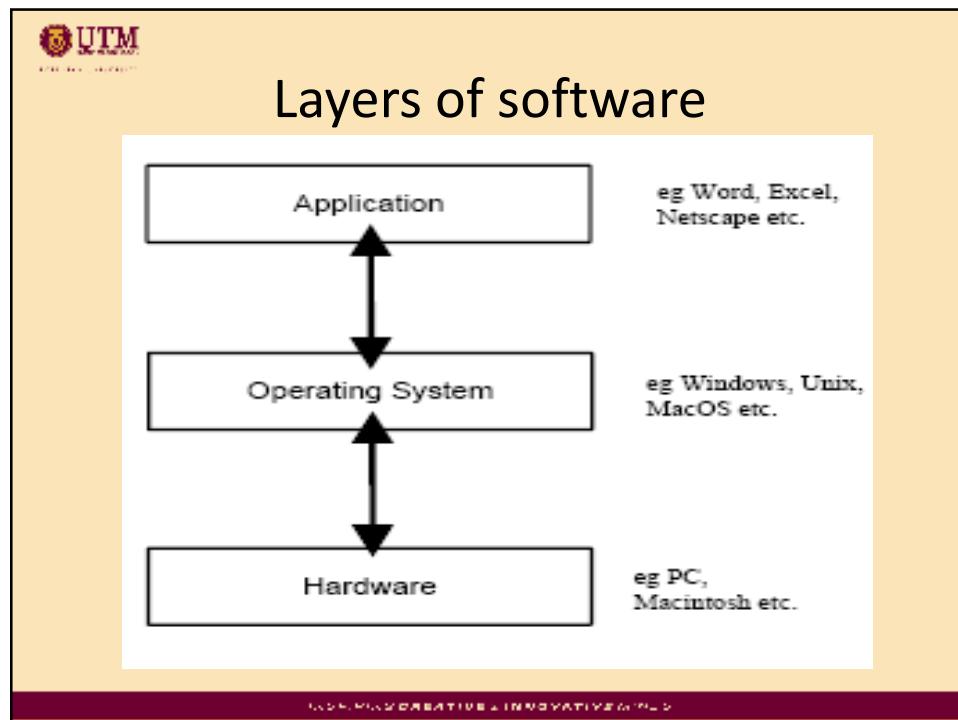
Computer Components: Hardware

- The physical components of a computer



Computer Components: Software

- Programs that run on a computer
- Categories of software:
 - System software
 - programs that manage the computer hardware and the programs that run on them.
 - Application software
 - programs that provide services to the user
 - Compilers
 - Translates computer programs to machine language.
 - Machine language: the only language the computer can understand. It is in binary machine code (0's/1's).



Programs & Programming Language

- A program is a set of instructions that the computer follows to perform a task
- Programming Language: a language used to write programs
- We start with an *algorithm*, which is a set of well-defined steps.



Algorithm Example: Calculating Gross Pay

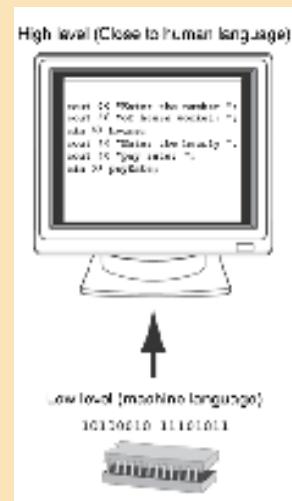
1. Display a message on the screen asking "How many hours did you work?"
2. Wait for the user to enter the number of hours worked. Once the user enters a number, store it in memory.
3. Display a message on the screen asking "How much do you get paid per hour?"
4. Wait for the user to enter an hourly pay rate. Once the user enters a number, store it in memory.
5. Multiply the number of hours by the amount paid per hour, and store the result in memory.
6. Display a message on the screen that tells the amount of money earned. The message must include the result of the calculation performed in Step 5.

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Type of Programming Language

- Low-Level Programming Language / Assembly Language
 - Similar to machine languages, but they are much easier to program.
 - Each CPU has its own assembly language.



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Type of Programming Language

- High-Level Programming Language
 - A language that people can read, write, and understand.
 - A programming language that is more user-friendly, to some extent platform-independent
 - Need to be translated into one or several machine instructions by a **compiler**.
 - **Example:** Java, C, C++

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Some well-known programming language

Table 1-1

Language	Description
BASIC	Beginners All purpose Symbolic Instruction Code. A general programming language originally designed to be simple enough for beginners to learn.
FORTRAN	Formula Translator. A language designed for programming complex mathematical algorithms.
COBOL	Common Business-Oriented Language. A language designed for business applications.
Pascal	A structured, general-purpose language designed primarily for teaching programming.
C	A structured, general-purpose language developed at Bell Laboratories. Offers both high level and low level features.
C++	Based on the C language, C++ offers extended features not found in C. Also invented at Bell Laboratories.
C#	Pronounced "C sharp." A language invented by Microsoft for developing applications based on the Microsoft .NET platform.
Java	An object-oriented language invented at Sun Microsystems. Java may be used to develop programs that run over the Internet in a Web browser.
Visual Basic	A Microsoft programming language and software development environment that allows programmers to quickly create Windows-based applications.

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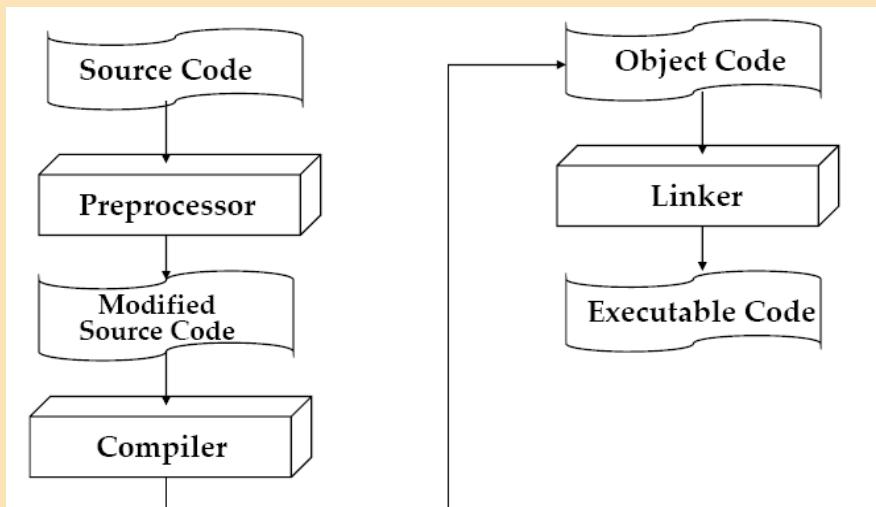
From High-Level to Executable File

- a) Create file containing the program with a text editor.
 - b) Run preprocessor to convert source file directives to source code program statements.
 - c) Run compiler to convert source program into machine instructions.
 - d) Run linker to connect hardware-specific code to machine instructions, producing an executable file.
- Steps b-d are often performed by a single command or button click.
 - Errors detected at any step will prevent execution of following steps.

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From High-Level to Executable File



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Integrated Development Environment (IDE)

- An integrated development environment, or IDE, combine all the tools needed to write, compile, and debug a program into a single software application.
- Examples are Microsoft Visual C++, Borland C++ Builder, CodeWarrior, etc.

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IDE

```

GrossPay - Microsoft Visual C++ [design] - Pr1-1.cpp*
File Edit View Project Build Debug Tools Window Help
StartPage Pr1-1.cpp | main
(Global)
1 // This program calculates the user's pay.
2 #include <iostream>
3 using namespace std;
4
5 int main()
6 {
7     double hours, rate, pay;
8
9     // Get the number of hours worked.
10    cout << "How many hours did you work? ";
11    cin >> hours;
12
13    // Get the hourly pay rate.
14    cout << "How much do you get paid per hour? ";
15    cin >> rate;
16
17    // Calculate the pay.
18    pay = hours * rate;
19
20    // Display the pay.
21    cout << "You have earned $" << pay << endl;
22    return 0;
23 }

```

Solution Explorer - GrossPay

- Solution 'GrossPay' (1 project)
 - GrossPay
 - References
 - Source Files
 - Pr1-1.cpp
 - Header Files
 - Resource Files

Properties - Pr1-1.cpp File Properties

Name:	Pr1-1.cpp
Content:	File
FileType:	C/C++ Code
Full Path:	C:\Documents and Settings\...\Books\Some\Pr1-1.cpp
Relative Path:	...\Books\Some\Pr1-1.cpp

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