Programming for Problem Solving

2ES104

Problem to Solution

WHAT IS PROBLEM SOLVING?

HOW WE WILL IMPLEMENT SOLUTION ?

- By Programming

WHAT IS PROGRMMING ?

- Program: a set of instructions that you give to a computer so that it will do a particular task
- Programming is a way to “instruct the computer to perform various tasks”.
- **Programming** is the process of creating a set of instructions that tell a computer how to perform a task.
- **Programming** can be done using a variety of computer **programming** languages, such as JavaScript, Python, C(PPS) and C++..

C Programming / PPS

- **C** is a powerful general-purpose **programming** language.
- It can be used to develop software like operating systems, databases, compilers, and so on.
- The C language, which is quite simple, is not tied to any particular hardware or system.
- This makes it easier for a user to write programs that will run without many (or any) changes on practically all machines.

What is Operating System?

- An Operating System (OS) is an interface between a computer user and computer hardware
- An operating system (OS) is system software that manages computer hardware, software resources, and provides common services for computer programs.

First Operating System

- The **first operating system** created by Microsoft was called MS-DOS.
- **MS-DOS**, in full Microsoft Disk Operating System, the dominant operating system for the personal **computer** (**PC**) sometimes referred to as "DOS".
- It's user-interface is command-line and does not have GUI.

Linux OS

- Linux is an open-source operating system like other operating systems such as Microsoft Windows, Apple Mac OS, iOS, Google android, etc.
- An operating system is a software that enables the communication between computer hardware and software.

Practical-1

Getting introduce to following:

(1) GCC compiler to run programs using Linux terminal.

(a) What is Linux?

(b) What is terminal in Linux?

(c) What is GCC? What is gedit?

(d) What is the compilation and linking? Which files will be generated on successful compilation?

(e) Explain following commands with example:

mkdir	cd	ls	clear	date	touch	mv	cat	uname
rmdir	man	exit	cp	rm	pwd	locate	df	chmod

Compiler

- A **compiler** is a special program that processes statements written in a particular programming language and turns them into machine language or "code" that a computer's processor uses.

IDE to Compile and Run C Program in Window

- An integrated development environment (IDE) is a software application that provides comprehensive facilities to computer programmers for software development.
- An IDE normally consists of at least a source code editor, build automation tools and a debugger.
- Example
    - Turbo C ,Visual Studio Code,Eclipse,NetBeans,codewords

Online Compiler

- https://www.onlinegdb.com/
- https://www.programiz.com/
- Turboc
- https://turboc.me/download-turbo-c-file/

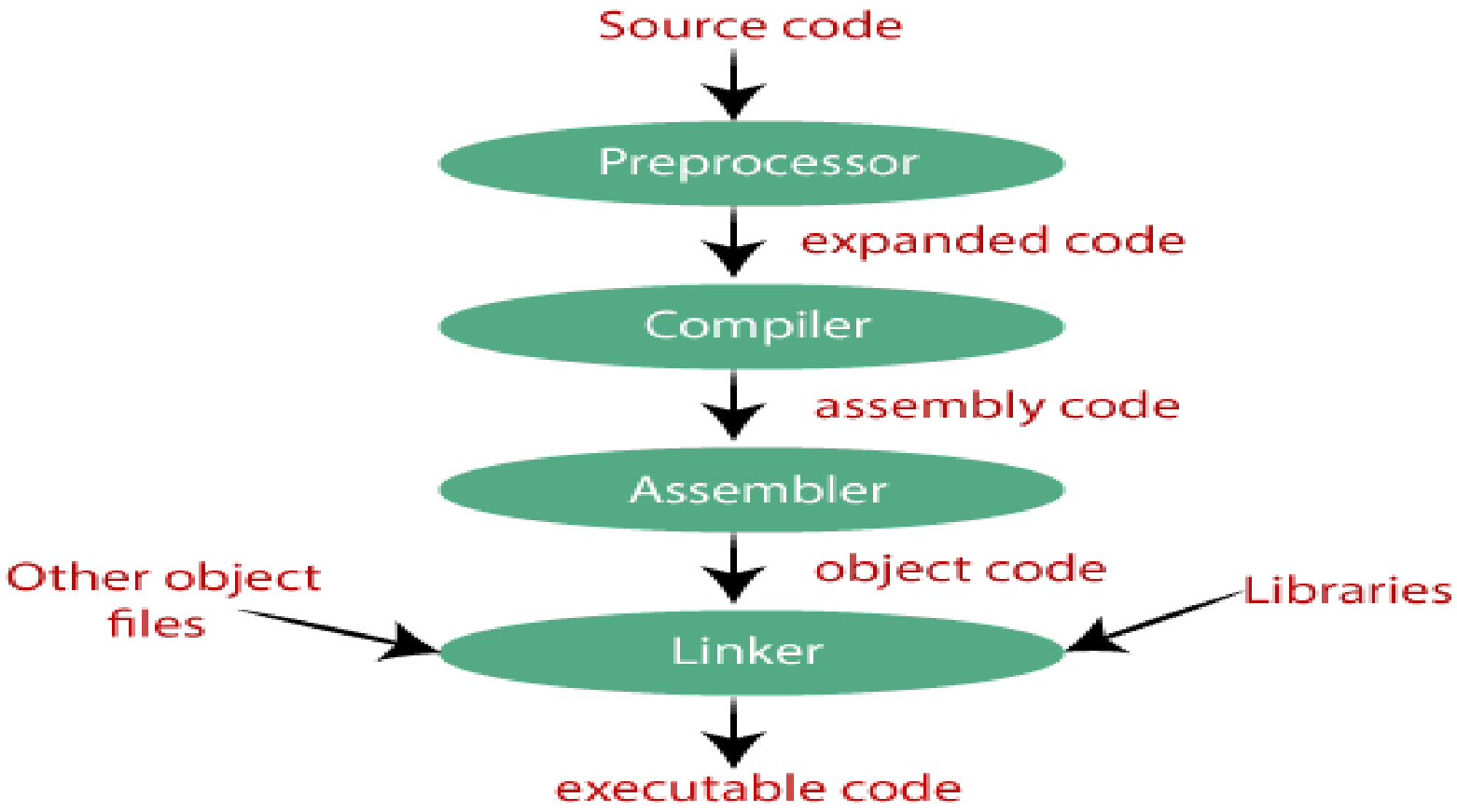
GCC

- The GNU Compiler Collection is an optimizing compiler produced by the GNU Project supporting various programming languages, hardware architectures and operating systems.
- Formerly called the GNU C Compiler, the GCC now contains compilers for the C, C++, Objective C, Fortran, Java and Ada programming languages.

Compiler

- The c compilation process converts the source code taken as input into the object code or machine code.
- The compilation process can be divided into four steps, i.e., Pre-processing, Compiling, Assembling, and Linking.
- The preprocessor takes the source code as an input, and it removes all the comments from the source code.

Compilation Process



Compiler

- The code which is expanded by the preprocessor is passed to the compiler.
- The compiler converts this code into assembly code.
- The assembly code is converted into object code by using an assembler.
- Mainly, all the programs written in C use library functions.
- These library functions are pre-compiled, and the object code of these library files is stored with '.lib' (or '.a') extension.
- linker combine the object code of library files with the object code of our program.

How can we compile and run c program in linux?

- Later When we learn structure of C Program

- https://www.youtube.com/watch?v=WiaiZmWxcck

- https://www.studytonight.com/c/compile-and-run-c-program.php

Chmod

- chmod command is used to change the access mode of a file. The name is an abbreviation of change mode.
- Syntax :
- chmod [reference][operator][mode] file...

Chmod

References	Class	Description
u	Owner	File's owner
g	Group	Users who are member of file's group
o	Others	Users who are neither the file's owner nor member of the file's group
A	All	All three of the above

Operators	Description
+	Adds specified modes to specified class
-	Removes the specified modes from specified class
=	The modes specified are to be made the exact modes for the specified classes

Chmod

Modes	Description
R	Permission to read file
W	Permission to write file
X	Permission to execute file, or, in case of directory , search it.

```
[sbp@linuxserv ~]$ chmod u+x p1.txt
[sbp@linuxserv ~]$ ls -l p1.txt
-rwxrw-r-- 1 sbp sbp 9 Jan  6 14:51 p1.txt
[sbp@linuxserv ~]$
```

Part-II

(2) Turbo C compiler using command prompt in Windows:

(a) What is windows?

(b) What is command prompt (cmd)?

(c) What is Turbo C? How to open it? How to write and run programs?

(d) What are different files to be generated on successful compilation?

(e) Explain following programs with example:

cd	mkdir	cls	date	time	rename	del/erase	echo	ping
D:	dir	copy	find	move	rmdir	attrib	exit	ipconfig

Linux Vs Window

- https://www.geeksforgeeks.org/linux-vs-windows-commands/

Practical-1

- Write a program to display “Welcome to Ganpat University – U. V. Patel College of Engineering” as output using any

  online websites / tools given below: onlinegdb.com , programiz.com

Practical-1:Codeblock Installation

- Step 1: Download any of them (Codeblock software + gcc compiler integrated setup file):
- codeblocks 20.03 (32-bit) with mingw compiler (64-bit) setup: https://drive.google.com/file/d/18UZnpRxv3VlWmuellUT0EKIHSkE6Fm4w/view?usp=sharingtested
- codeblocks 20.03 (32-bit) with mingw compiler (32-bit) setup: https://drive.google.com/file/d/1FAiSSvn89shbcdyIEpfMBsPEwKLFTF-K/view?usp=sharing
- codeblocks 20.03 (64-bit) with mingw compiler (64-bit) setup:
- https://drive.google.com/file/d/1qhY_GsBaZu3tY5-D7vsdw4W3WvIi60SY/view?usp=sharing

Practical-1:Codeblock Installation

- Step 2: Double click on downloaded exe file and install it normally.
- Do not run the codeblock software after installation get completed.
- Step 3: Set following value in environment variable "path" user variable.
- C:\Program Files (x86)\CodeBlocks\MinGW\
- Step 4: Check and verify that minGW/bin folder is exist in the installation directory of Codeblocks

Practical-1: Codeblock Installation

- Step 5: Now open codeblock and find "Settings=>compiler" menu.
- In that, Make sure the selected compiler is "GNU GCC Compiler“
- Step 6: Click on "Toolchain executables" tab
- Set here compilation installation directory as
- C:\Program Files (x86)\CodeBlocks\MinGWand
- C Compiler: select gcc.exe file from minGW/bin folder.