ASSIGNMENT 9

Basic Reading Material

Please use the following basic reading material:

- http://www.gnu.org/software/binutils/
- http://sourceware.org/binutils/docs/gprof/
- http://www.ibm.com/developerworks/ linux/library/lgasnasm/index.html
- http://www.cprogramming.com/reference/preprocessor/

Advanced reading Material

The reader with advanced background would find this material useful:

1. http://www.ibiblio.org/gferg/ldp/GCC-Inline-Assembly-HOWTO.html#s2

Introduction : What will we learn here ?

Optimizing code for speed using inline assembling.

The Problem Statement

Problem 1 (Compulsory - 100 marks, difficulty level: *)

Given two integers, write a time efficient c code, that spends as less time in memory access and more in calculations as possible, to get their GCD and LCM.Use directives for conditional compilation of code as follows.

IDENTIFIER STATUS	VALUE	COMPILE ACTION
DEFINED	1	GCD
DEFINED	0	LCM

Find the critical parts of code that consume more percentage of time using gprof and replace those parts with inline assembly coding to optimize speed and compare the time profiling for both codes.

Optional bonus problems

These following problems are optional and have higher levels of difficulty. Bonus marks (indicated against each) will be given for attempting these.

Problem O1 : (Difficulty level: *,marks: 5)

Find the most significant non zero bit position for largest of the two given integers using pure c code and inline assembled c code and show which one is faster.

Problem O2 : (Difficulty level: **,marks: 5)

Convert the given integer(assumed to be angle in degrees) to radians and find the floating point cosine value with pure c and inline assembled c and determine fastest one using gprof.

Problem O3 :(Difficulty level: *,marks: 5)**

Use gprof on the code of assignment no-04 Library management and rewrite the code to optimize time.

Submission Instructions

Please follow the submission instructions below:

1. Upload on Sakai before 17:15 hours