

Quiz 2 Study Guide

LC3

ISA feature: wordsize, memory address range and addressability, how function & traps work.

Be able to write small snippets of code in LC3. The instruction format will be provided and as well as the TRAP numbers for I/O calls.

Misc

C to LC3 and vice-versa

Any C programming trait discovered while doing any of the homework's ?

Chapter 11: Intro to C

Interpretation vs. Compilation

C Compiler stages

main() function

I/O (printf & scanf) – **Some stuff also covered in chp 18**

Chapter 12: Variables

C Basic Data types

Properties of a variable (identifier, type, scope, storage)

Order of evaluation, precedence and associativity for assignment, equals, logical, bitwise, and relational operator. How is bitwise different from logical?

Is order of evaluation always defined?

How global & local variables are put in memory (mainly ties in with chapter 14)

Compiler symbol table (refer to quiz2 question for example)

Chapter 13: Control Structures

If-else, else-if

switch

while vs. for

break and continue (in what type of control structures can they be used)

Converting C control statements to LC3 and vice-versa (the code snippets will be small in the interest of time) – **refer to quiz2 question for example**)

Chapter14: Functions

How do you write C functions (Covered in tutorial)?

What is an Activation Record? What does it contain? Why do we need it?

What is a frame pointer? and stack pointer? Why do we have maintain frame pointer along with stack pointer?

How does the function call mechanism work (use my slides for this not the book)?

Chapter 16: Pointers & Arrays

What is address operator “&” do?

What is pointer? How do you declare a pointer? What does it mean to dereference a pointer? Problems with pointers?

How to declare & use arrays? How LC3 code looks for arrays?

Difference between pointer and array? and relationship between them?

Array bound checking in C

How are arrays passed to function? Why? (hint: what happens when you return from a function call)

Strings in C? Accessing string as array vs. pointer? Know what strlen(), strcpy() & strcmp() in string.h do?

Chapter 18 – I/O in C

What is a text stream? What is stdin and stdout?

File I/O (worked also in C tutorial 2)

Problems with printf and scanf arguments if they are wrong or not provided, or bad input?

CR, LF control characters

Pretty much everything covered in chp18 slides

Chapter 19 (only till section 19.4.1 in book and material in slides)

What is data structure? How do you declare one in C? How do access member fields of struct?

What is the usability of typedef?

How does a data structure appear on the run-time stack if statically declared?

How is dynamic memory allocation done in C?

What are the potential pitfalls of letting the user to do explicit memory management vs. having a garbage collector?

Why is dynamically allocated memory put on heap and not in stack?

Material Covered in CTutorial1 and CTutorial2

initialization of variables, writing functions and structs, compiling source file and linking different C files, static vs. dynamic library? Any advantage of dynamic library?