

B.tech. VII Sem (CSE), 2019-20

Compiler Construction, Assignment # 1

August 8, 2019

1. What are the phases of compiler ? Explain the functions performed by each phase.
2. How the compiler course is related to following courses? Explain each in brief.
 - (a) data structure
 - (b) discrete structures
 - (c) operating systems
 - (d) programming languages
 - (e) graph theory
 - (f) C language
3. Construct output for the following arithmetic expressions, for all the phases.
 - (a) $a > b \ \&\& \ b < c$
 - (b) $a/b + c/d - e/f$
4. What is relocatable code? Can you always load your executable code into any part of the memory? Justify for Yes/No.
5. What are the functions of linker? What actually it does?
6. Answer each in very brief.
 - (a) How an interpreter is different from a compiler?
 - (b) How a Java compiler and interpreter are different from conventional compilers and interpreters?
 - (c) Give merits of compiler compared to interpreter.
 - (d) Give merits of an interpreter compared to a compiler.
 - (e) Which phase handles the type checking in compiler?
 - (f) Is JVM hardware or Software?
 - (g) What is difference between the pass and phase of a compiler?
 - (h) What is difference between *whitespace* and *delim*?
7. Construct a transition diagram to recognize all the following:
 - (a) Unsigned integers.
 - (b) Unsigned floating pointing point numbers.
 - (c) Unsigned exponential numbers.
8. Write the regular expressions for the following types: integer, float, identifier, character, white space, exponential number format.
9. Write a C program "main.c", which declares a function "int largest(int *);", i.e., the function returns the largest integer in an array of 10 integers. Assume that the function definition exists in a separate source file "largest.c". Once the function is called, it returns the largest number in array, and it is printed through the main.c file. Given these two files of a source program, answer the following:

- (a) How you can compile each file using *GCC* to produce *.o* files (*main.o* and *largest.o*) as object files without linking them?
- (b) What is command to produce assembly language files, after compilation (not object files) for each source files.
- (c) What is command to link the files produced in part (a) above, to get *a.out* ?
- (d) What is command to compile and link files to produce single *a.out* file?

Submission deadline: 16-08-2019. Write your answer in A4 or register paper, and submit hardcopy in the class. 75% score for correctly answering, 25% for timely submission