CSE 131

Compilation/Compiler Overview, Names/Scopes/Bindings

1. Give the order of the phases of compilation in a typical C compiler as discussed in class

0 – Source language file (for example, prog.c)   4 – Intermediate Representation(s)
1 – Parser (Semantic Analysis)   5 – Scanner (Lexical Analysis)
2 – Target language file (for ex., prog.s)   6 – Parser (Syntax Analysis)
3 – Code generation (for ex., Assembly)

_____ –> _____ –> _____ –> _____ –> _____ –> _____ –> _____

Machine-independent improvements typically can occur immediately before, during, and/or immediately after which phase? _____

Machine-specific code improvements typically can occur immediately before, during, and/or immediately after which phase? _____

2. Given the following CUP grammar snippet (assuming all other Lexing and terminals are correct):

```
Stmt  ::=       Designator T_ASSIGN Expr T_SEMI
                {: System.out.println("0"); :}
      ;

Expr  ::=       Expr {: System.out.println("1"); :} MulOp Designator
                {: System.out.println("2"); :}
      |         Designator {: System.out.println("3"); :}
      ;

MulOp ::=       T_STAR {: System.out.println("4"); :}
      ;

Designator ::= T_ID {: System.out.println("5"); :}
      ;
```

What is the output on the screen when the follow statement is given as input:

```
a = b * c;
```

Give an example of a terminal symbol from this grammar

_____

Give an example of a non-terminal symbol from this grammar

_____

(over)

3. Specify the sizes of the various data types listed for the following Compiler Models

	ILP-32	LP-64
int	_____	_____
long	_____	_____
long long	_____	_____
pointer	_____	_____

4. What is the name of the file in the compiler starterCode that defines the grammar for this quarter's language?

What is the name of the file in the compiler starterCode that contains the methods to perform semantic analysis?

5. Using the Makefile with the supplied starterCode, after running "make" to build your compiler what do you type on the command line to compile a source file named "foo.rc"

6. Specify whether the following uses static or dynamic binding

0 – Static binding   1 – Dynamic binding

_____ Link time   _____ Load time

_____ Run time   _____ Compile time

7. Give the order of the typical C compilation stages and on to actual execution as discussed in class

0 – Object file (prog.o)   5 – Assembly file (prog.s)
1 – prog.exe/a.out (Executable image)   6 – cpp (C preprocessor)
2 – Loader   7 – ccomp (C compiler)
3 – as (Assember)   8 – Source file (prog.c)
4 – Program Execution   9 – ld (Linkage Editor)
                                            10 – Segmentation Fault (Core Dump)
                                                  / General Protection Fault

gcc _____ –> _____ –> _____ –> _____ –> _____ –> _____ –> _____ –> _____ –> _____ –> _____ –> _____

8. Briefly describe what your group did to fix the Phase 0 scoping bug in the starterCode. "My partner fixed it." is not an acceptable answer. :-)