**CCS-3145/HIGH 3633**

## Grade

**Concept of Programming Language**

**First semester 2021-22**

**Homework-3**

**Name, Family Name :\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ID # :\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Section # : Signature : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Q1.** What is a reserved word?

* reserved word is a special word that cannot be used as a user-defined name
* reserved words are terms or phrases appropriated for special use that may not be utilized in the creation of variable names. For example, "print" is a reserved word because it is a function in many languages to show text on the screen.

**Q2.** In Java and C#, how long can a name be?

As long as possible

**Q3.** What is the address of a variable?

* the machine memory address with which it is associated.
* A program being executed by a processor has two major parts - the code and the data. The code section is the code you've written and the data section holds the variables you're using in the program.

All code and variables are loaded into memory (usually RAM) and the processor executes the code from there. Each segment (usually a byte) in the memory has an address - whether it holds code or variable - that's the way for the processor to access the code and variables.

**Q4.** What are the advantages and disadvantages of dynamic type binding?

advantage to dynamic type binding is you do not have to recompile all of the source code that relies on the code that is dynamically bonded. This could include code from you, your business, or other companies/people using the code. The primary advantage of dynamic binding of variables to types is that it provides more programming flexibility. For example, a program to process numeric data in a language that uses dynamic type binding can be written as a generic program, meaning that it is capable of dealing with data of any numeric type. Whatever type data is input will be acceptable, because the variables in which the data are to be stored can be bound to the correct type when the data is assigned to the variables after input.

There are two disadvantages to dynamic type binding. First, it causes programs to be less reliable, because the error-detection capability of the compiler is diminished relative to a compiler for a language with static type bindings. Dynamic type binding allows any variable to be assigned a value of any type. Incorrect types of right sides of assignments are not detected as errors; rather, the type of the left side is simply changed to the incorrect type.

The greatest disadvantage of dynamic type binding is cost. The cost of implementing dynamic attribute binding is considerable, particularly in execution time. Type checking must be done at run time. Furthermore, every variable must have a run-time descriptor associated with it to maintain the current type. Languages that have dynamic type binding for variables are usually implemented using pure interpreters rather than compilers.Computers do not have instructions whose operand types are not known at compile time. Therefore, a compiler cannot build machine instructions for the expression A + B if the types of A and B are not known at compile time. Pure interpretation typically takes at least 10 times as long as it does to execute equivalent machine code. Of course, if a language is implemented with a pure interpreter, the time to do dynamic type binding is hidden by the overall time of interpretation, so it seems less costly in that environment. On the other hand, languages with static type bindings are seldom implemented by pure interpretation,

because programs in these languages can be easily translated to very efficient machine code versions

**Q5.** Consider the following example program. Assume that the only function calls are the following: main calls sub2, which calls sub1.

void sub1() {

int a, b;

. . . <------------ 1

} /\* end of sub1 \*/

void sub2() {

int b, c;

. . . . <------------ 2

sub1();

} /\* end of sub2 \*/

void main() {

int c, d;

. . . <------------ 3

sub2();

} /\* end of main \*/

Explain the referencing environments of the indicated program points 1, 2, 3.

**1.**

**2.**

**3.**

**Q6.** Define static, stack-dynamic, explicit heap-dynamic, and implicit heap-dynamic

variables. What are their advantages and disadvantages?