1. Some programming languages are typeless. What are the obvious advantages and disadvantages of having no types in a language?

Typeless language는 프로그래머가 type을 고려하지 않아도 되므로 쉽고 빠르게 프로그램을 작성할 수 있다는 장점이 있다. 즉, 편의성과 유연함을 제공한다.

그러나, typeless language는 잘못된 type끼리의 연산으로 사용자가 의도치 않은 결과로 이어지기 쉽고, 이를 컴파일러는 오류로 인식하지 않으므로 사용자가 오류를 발견해 수정하기 어렵다는 단점이 있다.

2. Consider the following JavaScript program: List all the variables, along with the program units where they are declared, that are visible in the bodies of sub1, sub2, and sub3, assuming static scoping is used.

Sub1 : x(main), a(sub1), y(sub1), z(sub1)

Sub2 : x(main), y(sub1), a(sub2), b(sub2), z(sub2)

Sub3 : y(main), z(main), a(sub3), x(sub3), w(sub3)

3. Consider the following Python program. List all the variables, along with the program units where they are declared, that are visible in the bodies of sub1, sub2, and sub3, assuming static scoping is used.

Sub1 : a(sub1), y(sub1), z(sub1), x(main)

Sub2 : a(sub2), x(sub2), w(sub2), y(main), z(main)

Sub3 : a(sub3), b(sub3), z(sub3), w(sub2), x(sub2), y(main)

4. Consider the following skeletal C program. Given the following calling sequences and assuming that dynamic scoping is used, what variables are visible during execution of the last function called? Include with each visible variable the name of the function in which it was defined.

1. d,e,f(fun3), c(fun2), b(fun1), a(main)

b. d,e,f(fun3), b,c(fun1), a(main)

c. b,c,d(fun1), e,f(fun3), a(main)

d. b,c,d(fun1), e,f(fun3), a(main)

e. c,d,e(fun2), f(fun3), b(fun1), a(main)

f. b,c,d(fun1), e(fun2), f(fun3), a(main)

5. Consider the following program, written in JavaScript-like syntax. Given the following calling sequences and assuming that dynamic scoping is used, what variables are visible during execution of the last subprogram activated? Include with each visible variable the name of the unit where it is declared.

1. a,x,w(sub3), b,z,(sub2), y(sub1)
2. a,x,w(sub3), y,z(sub1)
3. a,y,z(sub1), x,w(sub3), b(sub2)
4. a,y,z(sub1), x,w(sub3)
5. a,b,z(sub2), x,w(sub3), y(sub1)
6. a,y,z(sub1), b(sub2), x,w(sub3)