

## CSE 461: Programming Languages Concepts

Prof. G. Tan, Spring 2022

Homework 2: Due on **Feb 13th at 6pm**. **Only one-day late submission will be allowed for this assignment**, since I want to release the answer key early for you to prepare for midterm 1. Total: 13 points.

*Submission:* If you submit a scanned version of your on-paper answers, please make sure your scanned version is legible.

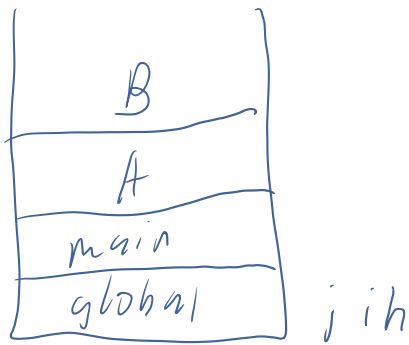
1. (8 points) Consider the C program given below. You will be asked to determine which variables are visible in a number of different situations. In each case, identify each variable by its name and the line number of its declaration. Note: for this problem, only list visible variable names, not function names.

```
1  int j, i, h;
2  void B(int w) {
3      int j;
4      i = 2*w;
5      w = w+1;
6      ...
7  }
8  void A (int x, int y) {
9      float i;
10     B(h);
11     i = 3;
12     ...
13 }
14 void main() {
15     int a, b;
16     h = 5; a = 3; b = 2;
17     A(a, b);
18     B(h);
19     ...
20 }
```

- (a) C uses static scoping. Say which variables are visible in the bodies of each of the functions: main, A, B.

- (b) If C used dynamic scoping and the calling sequence is main calls B. Say which identifiers would be visible in B.
  - (c) If C used dynamic scoping and the calling sequence is main calls A. Say which identifiers would be visible in A.
  - (d) If C used dynamic scoping and the calling sequence is main calls A; A calls B. Say which identifiers would be visible in B.
2. (3 points) Find some online material to learn C#'s namespace mechanism (cite your source). Explain briefly how it works and its benefits.
3. (2 points) Answer the following questions. If necessary, consult a reference on C (and cite your source).
- (a) What is the scope and what is the lifetime of a static local variable?
  - (b) What is the scope and what is the lifetime of a static global variable?

1. a)



b)



2w, 3j, 15a, 15b, li, lh

main : 15a, 15b, li, lj, lh, A, B

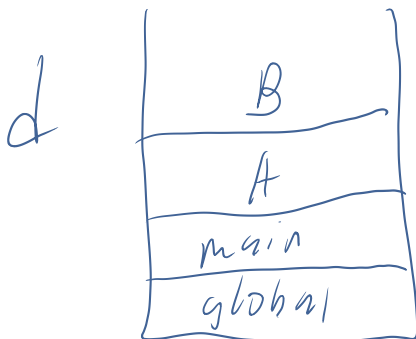
A : 9i, 8x, 8y, li, lj, lh

B : 2w, lj, li, lh



func : B

Var : 8x, 8y, 9i, 15a, 15b, lj, lh



Var : 2w, 3j, 8x, 8y, 9i, 15a, 15b

2)

<https://www.c-sharpcorner.com/UploadFile>

</hussainpatel/understanding-namespace-in-C>

[-Sharp/](#)

<https://www.cnblogs.com/codestiny/archive>

</2008/10/03/1303326.html>

*after use, it will auto release and save space*

<https://docs.microsoft.com/en-us/dotnet>

</csharp/language-reference/keywords>

</namespace>

it can help to control scope of the class,

and when we use or create some method with same name, we can separate them using namespace.

So we can avoid problems occur while we load different libraries and methods.

3

<https://www.csee.umbc.edu/~chang/cs202.f15>

</Lectures/modules/m05-scope/slides.php?print>

<https://www.tutorialspoint.com/what-is-the-lifetime>

[-of-a-static-variable-in-a-cplusplus-function#:~:text=](#)

[The%20space%20for%20the%20static,variable](#)

[%20is%20given%20as%20follows.](#)

3. a) scope of a static local variable is to the block in which the variable is defined

life time of a static local variable is the lifetime of the program

b) Scope for static global variable is the whole program after it has been defined  
lifetime for static global variable is from it defined to program end.