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CECS 424

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Assignment 4

1. Consider the following pseudocode. What does this program print if the language uses static scoping? What does it print with dynamic scoping? Why?
   1. Static scoping

|  |  |
| --- | --- |
| a:5, b:6 |  |
| a:3, b:4 |  |
| a:1, b:2 |  |
| Stack |  |

Print Result:

1 2 3 4 5 6

The compiler looks at the global variable if it doesn’t find value in the local variable.

* 1. Dynamic scoping

|  |
| --- |
| a:5, b:6 |
| a:3, b:4 |
| a:1, b:2 |
| Stack |

Print Result:

3 4 5 6 1 2

The compiler always looks at the last modification of variables.

1. Consider the following pseudocode, assuming nested subroutines and static scope:
   1. What does this program print?

|  |
| --- |
| x : 1, g: 3 |
| x: 2, g: |
| x : 4, g: |
| x : 9, g: |
| Stack |

Print Result:

9 4 2 3

* 1. Show the frames on the stack when A has just been called. For each frame, show the static and dynamic links.



1. Consider the following fragment of code in C
   1. Assume that each integer variable occupies four bytes. How much total space is required for the variables in this code?

You will need to store 6 variables concurrently. Thus the total space required is 24 bytes.

1. What does this program print if the language uses static scoping? What does it print with dynamic scoping? Why?
   1. Static Scoping

|  |
| --- |
| x : 2 |
| x : 1 |
| x : 0 |
| Stack |

Print Result:

1 1 2 2

The last print out will be 2 because in static scoping, the compiler will look at the global variable if it doesn’t find the value in the local variable.

* 1. Dynamic Scoping

|  |
| --- |
| x : 2 |
| x : 1 |
| x : 0 |
| Stack |

Print Result:

1 1 2 1

The last print out will be 1 because in dynamic scoping, the compiler will look at the last value of x in the parent.

1. Consider the following pseudocode:
   1. What does this program print if the language uses static scoping?

Print Result:

1

* 1. What does it print if the language uses dynamic scoping with deep binding?

Print Result:

1