

Homework 2

1. Ada Scope Rules (2 pts)

```

procedure Main is
  X: Integer
  procedure S1 is
    begin -- of S1
      Put(X);
    end; -- of S1
  procedure S2 is
    X: Integer
    begin -- of S2
      X := 10;
      S1
    end; -- of S2
begin -- of Main
  x := 5;
  S2
end; -- of Main

```

Assume this Ada program was compiled and executed using **static-scoping rules**. What value of X is printed in procedure S1?

Under **dynamic-scoping rules**, what value of X is printed in procedure S1?

Static Scoping

Dynamic Scoping

Output: _____

2. Variables (2 pts)

[illegible]

Describe the value retrieved from **myaddr** when it is accessed by **float *fptr**, and when it is accessed by **int *iptr**.

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3. C struct (3 pts)

Given the following declarations:

```
struct Example {
    int data;
    char *tag;
};
struct Example *example;
```

Write the code segment needed to set the data variable to 25, and the tag string to "Hello World". First, malloc the storage for an Example struct. The output from this code segment should be: data = 25, tag = Hello World

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```
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```

4. Given the following program segment:

```
void foo(int **, int *, int *);

int main(void) {
    int x=2, y=4;
    int *A=&x, *B=&y, C=2;

    foo(&A, B, &C);
    return(EXIT_SUCCESS);
}

void foo(int **a, int *b, int *c) { ... }
```

The system stack begins at address 0x0248ffe0

The **addresses** of the variables declared in main are:

```
x:    0x00009012
y:    0x0000900E
A:    0x0000900A
B:    0x00009006
C:    0x00009002
```

Within the body of the function `foo`, give the values for the following expressions: (5 pts)

<i>Expression</i>	<i>Write address in the form 0xfeedbeef</i>
<code>a</code>	
<code>**a</code>	
<code>*a</code>	
<code>&a</code>	
<code>*b</code>	
<code>b</code>	
<code>&b</code>	
<code>*c</code>	
<code>c</code>	
<code>&c</code>	

5. Python (3 pts)

What does the following function output?

```
def myfunc(y):  
    x = y  
    def myinnerfunc():  
        print(x*x)  
    myinnerfunc()
```

myfunc(3)

Output _____

How do you know if this dynamic-scoping rules or static-scoping rules?