CSI 465 Compiler Design
LAB 3: Memory Allocation and Arrays

Objectives:
a) Understand memory allocation and register use in variable declarations.
b) Critically think about memory usage.

1) Background: In this lab you will investigate how memory is allocated to arrays and variables. Also, you will consider the local and global environments.

2) Exercises:
   a) Type the following code in the Frances code window.
      ```c
      int main(){
          int x = 1;
      }
      ```
      i) What memory addresses are assigned to x and each of the array elements?
      ii) Now change the order of the declaration lines. What changes in the addresses assigned to each variable?
      iii) Why do you think the variables are allocated this way?
   b) Next enter the following code?
      ```c
      int main(){
          int x = 1;
          return x;
      }
      ```
      i) What changes in the assembly code?
   c) Next change the code to the following.
      ```c
      int x = 1;
      int main(){
          x = 3;
      }
      ```
      i) What is the difference in the in the memory allocation?