Wednesday 19 November

Extra Credit Programming Assignment: due Monday 1 December
Programming Assignment 10: due Wednesday 3 December

## Class Activity 25:

*Objectives:*
> Learn about 2-D arrays.

Available on get12:     **ca25a.cpp.**  Place it in the **c:\user** directory.

*Activity 1*:
Open **ca25a.cpp** in Visual Studio.  Edit the top lines and the displayheader function
appropriately.  Looking at the code, answer the following questions.
> (a).    Why declare the defined constants **ONEDSIZE** and **TWODSIZE**?  What role do they
>          play?
> (b)     How does the declaration of a two-dimensional array differ from the declaration of a
>          one-dimensional array?
> (c)     What role do **onedused** and **twodused** have?  Why use them at all?
> (d)     In initializing **linarray**, why does the loop index start at zero?
> (e)     What does the statement **i++** in the **for** loop control mean?
> (f)     Why is **twodused** initialized as 3?  What more general initialization statement could
>          you use?
> (g)     Why have a two nested **for** loops to process a two-dimensional array?
> (h)     Why is the 15$^{th}$ element (value) in **linarray** found at **linarray[14]**?

*Activity 2*:
Run the code and answer the following questions.
> (a)     How is the display handled in showing **linarray** to have an evenly indented column
>          of numbers?
> (b)     How is the display handled in showing **twodarray** to have an evenly aligned table
>          of rows and columns?
> (c)     What value do you expect for **linarray[14]**?  Why?  What value is displayed?
>          Why?
> (d)     What value do you expect for **linarray[101]**?  Why?  What value is displayed?
>          Why?
> (e)     What value do you expect for **twodarray[5][8]**?  Why?  What value is displayed?
>          Why?
> (e)     What value do you expect for **twodarray[-1][12]**?  Why (you should be able to
>          predict this value)?  What value is displayed?  Why can you use array indexes that
>          are less than 0 and greater than **TWODSIZE**?

*Activity 3*:
The section of code that distributes the contents of a linear array to a square two-dimensional array can be easily converted to a function.

- (a)    Write a coherent purpose for such a function.
- (b)    Write a coherent goal state for such a function.
- (c)    What variables/information does the function require in order to operate?
- (d)    Write a prototype for the function.
- (e)    What is an appropriate calling statement for the function from `main`?

*Activity 4*:
Code the function from activity 3.  Cut and paste code appropriately.  Run your program.  Do you get the same results as before?

*Activity 5*:
The section of code that displays the contents of a square two-dimensional array can be easily converted to a function.

- (a)    Write a coherent purpose for such a function.
- (b)    Write a coherent goal state for such a function.
- (c)    What variables/information does the function require in order to operate?
- (d)    Write a prototype for the function.
- (e)    What is an appropriate calling statement for the function from `main`?

*Activity 6*:
Code the function from activity 5.  Cut and paste code appropriately.  Run your program.  Do you get the same results as before?

**Turn in**:   Your handwritten answers to questions 1, 2, 3, and 5.  A listing of your final `ca25a.cpp` program (after activity 6).  The screen display from running your program.