## Programming Exercise C - Environment and Exit

### Assignment Summary

In this assignment you will create a program in C that demonstrates the use of the **environ** global variable, and the **getenv()**, **exit()**, and **atexit()** functions as described in Chapter 2 of the Robbins slides. The program will use these functions to display information about the environment variables that are set in the operating system and also to display a specific message each time the program ends.

Download the student.c file from Blackboard to help you get started. When you have finished implementing and testing your program, submit your source code file to Blackboard.

### Software Requirements

**Exit Handler.** The program shall contain an exit handler function that displays the message shown below (including the 26 asterisks) as the last output from the program no matter what entries are provided on the command line. (Be sure to register the exit handler function as the first executable statements in the main() function.)

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Environment Variable Display Program (by First\_name Last\_name)

**Command Line.** The program shall only accept each of the options shown below as valid entries on the command line.

* + a.exe
  + a.exe  <environment\_variable\_name>
  + a.exe  -a

**Usage Message.** The program shall display the usage message shown below when more items than expected are found on the command line (i.e., when argc > 2). Note that after this message appears in the output, the automatic message printed by the exit handler shall appear just as it does with all the valid options described later in this assignment.

Usage:  
   a.exe  
   a.exe  <environment\_variable\_name>  
   a.exe  -a

**First Command Line Option.** When the first option, **a.out** (and nothing else) is entered on the command line, the program shall prompt the user for an environment variable name as shown in the example below.

% a.exe

Enter the name of an environment variable: PWD

If the name and value exist, the program shall print a blank line followed by the name and value pair formatted as shown in the example below.

PWD : /home/jonesm

\* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \*  
Environment Variable Display Program (by Mike Jones)

If the environment variable name does not exist, the program shall print a blank line and then an error message as shown in the example below, where **xyz** is the environment variable name.

xyz is not an existing environment variable name

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Environment Variable Display Program (by Mike Jones)

In either case, the program shall then terminate.

**Second Command Line Option.** When the second option, **a.out** and a sequence of characters other than **-a**, are entered on the command line, the program shall assume these characters constitute a single environment variable name. The program shall attempt to obtain the value for this environment variable name from the operating system. Depending on the results of that operation, the program shall print the same information (or the error message) as described in the format shown above for the first option. In either case, the program shall then terminate. Below are an example input and output.

% a.exe OPENWINHOME

OPENWINHOME : /usr/openwin

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Environment Variable Display Program (by Mike Jones)

**Third Command Line Option.** When the third option, **a.out -a**, is entered on the command line, the program shall display a list containing all environment variable names and assigned values, with one name and value pair per line, that are currently stored by the operating system. The program shall then terminate. Below is a portion of one possible sample output.

% a.exe -a

ALLUSERSPROFILE=C:\Documents and Settings\All Users  
APPDATA=C:\Documents and Settings\MikeJones\Application Data  
CLASSPATH=.;C:\Program Files\amzi\_6-2-14\lsapis\java20  
COMMONPROGRAMFILES=C:\Program Files\Common Files  
COMPUTERNAME=MIKEJONES  
COMSPEC=C:\WINDOWS\system32\cmd.exe  
FP\_NO\_HOST\_CHECK=NO  
HOMEDRIVE=C:  
HOMEPATH=\Documents and Settings\MikeJones  
INCLUDE=C:\Program Files\amzi\_6-2-14\include  
INFORMIXDIR=C:\Program Files\IBM\Informix\Client-SDK  
LOGONSERVER=\\SOLOMON-NEW  
NUMBER\_OF\_PROCESSORS=2  
OS=Windows\_NT

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Environment Variable Display Program (by Mike Jones)

### Implementation Constraints

* Name your source code file "ProgramC.c".
* Follow the same coding standards that were given in the previous assignments