

APPENDIX A2 – VISUAL BASIC WINDOWS and MATLAB APPLICATIONS

A) MATLAB

MATLAB® is a high-performance language for technical computing developed by The Mathworks Inc. It integrates computation, visualization, and programming in an easy-to-use environment where problems and solutions are expressed in familiar mathematical notation. Typical uses include

- Math and computation Algorithm development
- Data acquisition
- Modeling, simulation, and prototyping
- Data analysis, exploration, and visualization
- Scientific and engineering graphics
- Application development, including graphical user interface building

MATLAB is an interactive system whose basic data element is an array that does not require dimensioning. This allows one to solve many technical computing problems, especially those with matrix and vector formulations, in a fraction of the time it would take to write a program in a scalar non-interactive language such as C or FORTRAN.

The name MATLAB stands for *matrix laboratory*. MATLAB has evolved over a period of years with input from many users. In university environments, it is the standard instructional tool for introductory and advanced courses in mathematics, engineering, and science. In industry, MATLAB is the tool of choice for high-productivity research, development, and analysis.

MATLAB features a family of add-on application-specific solutions called toolboxes. Very important to most users of MATLAB, toolboxes allow one to learn and apply specialized technology. Toolboxes are comprehensive collections of MATLAB functions (M-files) that extend the MATLAB environment to solve particular classes of problems.

Areas in which toolboxes are available include signal processing, control systems, neural networks, fuzzy logic, wavelets, simulation, mapping and many others.

B) VISUAL BASIC

Microsoft's Visual Basic is a programming language developed by Microsoft Corporation. Visual Basic is a descendant of BASIC, which has been around for a number of years. BASIC (Beginner's All-Purpose Symbolic Instruction Code) was originally developed, as the name implies, as a language for beginners. BASIC was often the first language that programmers learned in order to become familiar with programming basics before moving on to more powerful languages.

With the advent of Windows, Microsoft developed Visual Basic, which is a *visual* (graphical) version of BASIC. Since its introduction, Visual Basic has developed into an extremely powerful application development tool, leaving its reputation as a beginners' language far behind.

By using Visual Basic to create your own customized programs, one is not bound by the limitations of a particular “off-the shelf” computer program; rather, one can design applications to meet one's own specific needs.

Visual Basic programs display a Windows style screen (called a **form**) with boxes into which users type (and edit) information and buttons that they click to initiate actions. The boxes and buttons are referred to as **controls**. Forms and controls are called **objects**.