 **Windows API for the C Programming Language**

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Having completed Inkscape vector graphics package and its few applications, we now move on to WinAPI (officially called the Microsoft Windows API) is an application programming interface written in C by Microsoft to allow access to Windows features. The Windows API is focused mainly on the programming language C, however API may be used by any programming language compiler or assembler. WinAPI is Microsoft’s core set of application programming interfaces (APIs) available in the Microsoft Windows operating systems. Microsoft provides development support in the form of software development kit (SDK) that includes documentation and tools needed to build software based on Windows API.

*What is API and how it is useful to us:*

When we develop software applications, sometimes we need to include portions of software developed by others in our applications. We can do this through the API provided by them. That is, any software developer who wants others to use features of his software in their applications has to provide API to his software. Thus, API allows access to features of software. I use WinAPI to access windows features to develop my application programs in C. For this, I have downloaded Windows SDK (Software Development Kit). SDK contains header files, libraries, samples, documentations and tools to develop applications in WinAPI. I have downloaded Visual Studio 2017 Community Edition (a freeware) IDE (Integrated Development Environment) that supports the C99 standard.

*Now let us try to understand functional areas of WinAPI. They are****:***

***Base services, Security, Graphics, User Interface, Multimedia, Windows Shell, and Networking***.

The *Base* services provide access to the fundamental resources on Windows such as file systems, devices, processes, threads, error handling etc. The *security area* provides programming elements for authentication, authorization, cryptography and other security related tasks. The Graphics subsystem facilitates outputting graphical content to printers, monitors, and other output devices. The User Interface facilitates the creation of windows and controls, simulation of user input etc. The Multimedia interface provides tools for working with video and audio. Windows Shell Interface allows access to the Windows Shell. The Windows Shell is a GUI (Graphical User Interface) that consists of the Start menu, the taskbar and the desktop of the user. Finally, the Networking Interface provides access to all network capabilities of Windows.

Let us plan our journey through the intricacies of WinAPI and make a mental modal to proceed.

This is a journey from the ground up. Therefore, I have split this journey into levels of excellence: Beginner, Intermediate and Advanced (Expert Level is reserved for later studies as we will be learning about the Windows Kernel, which requires a separate journey. It is not feasible to cover such a topic in this journey). In the Beginner level, we will be learning the basics of WinAPI and attempting to try out concepts in WinAPI and also C Programming Language. The aim of the Beginner level is to prepare ourselves to delve into more complex concepts further down our journey. In the Intermediate level, we will build upon the basics we have learned in the prior level. The aim of the Intermediate level is to transition from the Beginner to the Advanced Level. In the Advanced level, we start leaving our comfort zone, embracing the deeper levels of Windows and exploring new sets of functions, expanding our toolset for making programs encompassing more than one functional area of WinAPI. The Advanced level acts as a preliminary to the Expert level. After this, we are free to explore the remaining parts of Windows. This will allow us to make multifarious programs for Windows.

The aim of this journey is not to be limited to what we will be learning, but to explore beyond what we will learn. We will cover the minimum required concepts to progress to the higher levels. After learning the basics of every level, we are free to learn even more than what we will cover. The WinAPI we are using may get outdated as it is meant for Windows 10. As of 2024, Windows 11 WinAPI has been announced with major rewrites. This guide will be relying on the latest WinAPI version meant for Windows 10. The major rewrites to Windows 11 WinAPI won’t affect the majority of the functions and sub-APIs we will be covering (If it is affected, I will be mentioning it as we learn).

In the subsequent sessions, we shall try to develop application programs using some areas of WinAPI.