THE USE OF AN IDE WHEN PROGRAMMING

WHAT IS AN IDE AND WHY DO WE USE THEM?

 # An IDE = An integrated development environment, which is a single program used for developing programs and has a number of different components.

What are the key features used for debugging?

Inserting a breakpoint into the code

This allows the program to be stopped at a predetermined point in order to inspect its status. Users can then fix logic problems that an IDE can't identify

Trace Variables

This allows a programmer to see spontaneous values of variables and track run-time errors (mainly logical errors) in code. Watch points will detect the moment a variable changes value.

Stepping through code

Step through code one line at a time to allow the programmer to observe the effects of each line of code. Equivalent of having a break point on every lien of code.

Stack contents

It can display stack contents which show the sequencing through procedures, modules and functions and which ones have been called.

Crash dumps

IDE debugging can help produce a crash dump on a run-time error. This shows the state of variables at the point where the error occurs.

Code preview and error reports

Code can also be examined as the program runs to pinpoint errors. Error reports issue a message when a runtime error occurs. This will describe the error and suggest possible solutions. Syntax checks also underline erroneous code with syntax errors. The program displays a warning message and will not compile if these errors are present.

What are the key features that aid development?

Auto-completion of code

This increases the efficiency and reduces syntax errors due to misspelling. As you begin to type the first part of a function or common syntax, the code editor will suggest or complete the function and any arguments or variable.

Bracket matching and highlighting colours

This is used for languages that use pars of brackets to mark out blocks of code. It allows the code to be read and understood more quickly. If you forget to close bracket while writing, coloured sections may help you detect missing brackets. Keywords are also highlighted.

Syntax checks

This recognises incorrect use of syntax and highlights/underlines any errors when coding. When the mouse is hovered over erroneous code a message box describing the error and possible solutions appears.

Auto indentation

The IDE may auto-indent blocks of code that relate to the program structure. Indents clarify the control flow between conditions or loops and separate the local code within them from that without them. The program may also use lines to signify which blocks of code belong to which construct (e.g. for and IF and ELSE).

Automatic line numbering

Lines are automatically numbered making it easier to reference code and located specific lines or errors.

Other features of IDEs

Translator: This will compile or interpret source code into executable machine code for the CPU. The program can be run/tested within the IDE.

Auto-documentation: This explains the purpose of code, e.g. by noting modules and variables used, and its expected behaviour. This is collated into a .txt file that can be used by other developers to understand how and why the code was created.

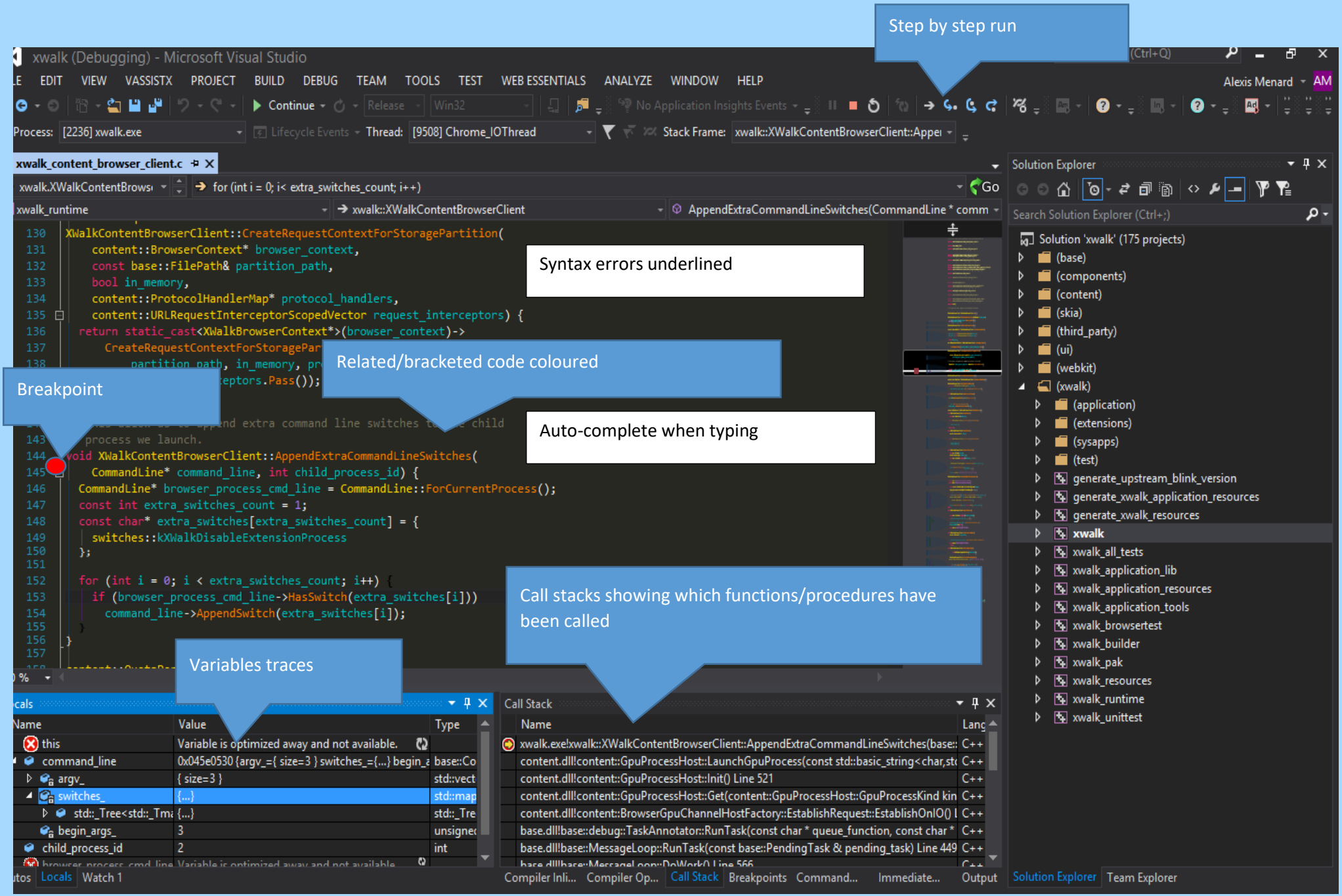
Libraries: These provide functions that are not included in the core part of the programming language. These functions can be imported and used at the beginning of a program. For example, In Python, the Turtle Graphics library provides access to simple drawing and graphics tools.

Build-automation: These tools allow the program to be compiled or interpreted and then published, saving time and money as this process would otherwise have to be done manually (translating to machine code!).

Another debugging technique……..

A dry run is the process of a programmer manually working through their code to trace the value of variables. There is no software involved in this process. These may occur during design, implementation, testing or even maintenance. Typical characteristics are:

- Used to identify logical errors
- They will not find execution errors
- No software is used (unless the programmer is manually working through code on screen).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Syntax errors underlined
Related/bracketed code coloured
Breakpoint
Auto-complete when typing
Call stacks showing which functions/procedures have been called
Variables traces
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