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Assignment – 1

1. Following are some of the tools/techniques used in the programming world. Categorize them based on which reasoning technique they relate to. Write three distinct points about the tool.
   1. Selenium
   2. Valgrind
   3. Lint
   4. Alt-Ergo
2. There is a requirement to install Linux for this course. For Windows users, there are multiple options to install Linux within Windows itself.
   1. By installing a virtual box on Windows and then Ubuntu.
   2. Enabling WSL, Windows Subsystem for Linux, and install Ubuntu.

Watch a couple of videos of how to do this in YouTube. You can install next week.

**1. Programming Tools**

**Selenium – Testing Tool**

* Selenium is a suite of software tools to automate Web Browsers.
* It is an Open source suite of tools mainly used for Functional and Regression Test Automation.
* Selenium supports various Operating environments like MS Windows, Linux, Macintosh etc...
* Selenium supports various Browsers such as Mozilla Firefox, IE, Google Chrome, Safari, Opera etc.
* Selenium supports various programming environments to write programs (Test scripts) such as Java, C#, Python, Perl, Ruby, PHP.

**Valgrind – Debugging Tool**

* “Valgrind” is a programming tool for memory debugging, memory leak detection, and profiling.
* The “Valgrind” tool suite provides a number of debugging and profiling tools that help you make your programs faster and more correct.
* The most popular of these tools is called “Memcheck” which is used to check memory related errors.
* It can detect many memory-related errors that are common in C and C++ programs and that can lead to crashes and unpredictable behaviour.

**Lint - Instrumentation**

* Linting is the process of checking the source code for Programmatic as well as Stylistic errors.
* A Lint or a Linter is a program that supports linting (verifying code quality). They are available for most languages like JavaScript, CSS, HTML, Python, etc.
* A lint tool is a basic static code analyzer which is used for automated checking of the source code for programmatic and stylistic errors.
* Lint tools fall into the static analysis category. They’re typically the most basic form of static analysis tool.

Lint tools are the most basic form of static analysis. Using lint tools can be helpful for identifying common errors, such as:

* Indexing beyond arrays.
* Dereferencing null pointers.
* (Potentially) dangerous data type combinations.
* Unreachable code.
* Non-portable constructs.

**Alt-Ergo – Formal Verification**

* Alt-Ergo is an automatic solver for mathematical formulas, specifically designed for program verification.
* It is an automatic prover of mathematical formulas used behind software verification tools
* It is based on satisfiability modulo theories (SMT). It is distributed under an open-source license.
* It is very successful for proving formulas generated in the context of deductive program verification.

**2. Linux Installation :**

* Already I am using my Laptop with Dual Boot. (Windows and Linux Mint).

**!... Thankyou …!**