Improving the Cling Packaging Tool

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Quick Overview of the CPT

- Cling Packaging Tool (CPT) is a command line utility that can easily build Cling from source and generate installer bundles for a variety of platforms including:
    - Ubuntu
    - Debian-based platforms
    - Windows
    - Red Hat Linux based distributions
    - Mac OS X
    - Unix-like platforms
- CPT is an incredibly useful and flexible tool, but there are several improvements that can be made to make the user's experience with the CPT even more seamless

Project Objectives

- Improvements to be made
    - Fixing platform issues
        - This mostly entails fixing builds with LLVM on Linux and Mac OS
        - Debian packaging creation
        - Fixing Windows builds
    - Rewriting the CPT itself
        - A full rewrite of the CPT, fixing old features as well as adding new features, and getting rid of non-functional options
    - Rewriting documentation
        - Adding new documentation for rewrite and fixes, as well as rewriting old documentation for overriding variables
    - Fixing miscellaneous issues
        - Fixing specific software dependency issues

Rewriting the CPT

- Using a different program execution starting point
  - I added a new if name block separate from all the program functions
- Revamping the argument parser
  - I added an option to only build Cling and not package it, as users want this option
  - I added some dependent arguments so that errors would be caught before any building is done
  - I also renamed some arguments for consistency
- I added a feature to specify the number of CPU cores to use when building Cling
- Reduced global variable mutation
  - Implemented parameter passing style for a couple of global variables where possible, as most of the global variables are deeply embedded in the CPT
- Made the CPT more flake8 compliant, although almost all of the flake8 errors are due to the lines being longer than 79 characters

Fixing platform issues and miscellaneous issues

- Fixing builds using LLVM prebuilt binary packages on Linux and MacOS and adding that to continuous integration
  - I have added LLVM 13 prebuilt binary support for Ubuntu and MacOS, I wasn't able to test these prebuilt binaries as the LLVM 13 branch hasn't been merged
- Fixing Debian packaging creation
  - I have fixed Debian packaging creation for the current-dev option, I fixed the debianize function
- I fixed the verbose output flag option and fixed the cmakeDir variable for Windows builds
- I'm currently testing CPT on other Linux distros, Windows and MacOS

Future work

- Reduce global mutation even more
- Adding a test option for running tests on the CPT options
- Also adding Cling and CPT to Github Actions
- Adding prebuilt binary support for other Linux distros

Thank you!