Python & C++ clang-repl integration

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Progress Stages

- Integrate Python in clang-repl
- Expand Python utilities to include `ExecScriptPython` `ExecSimplePythonCommand`
- Manage Python’s global dict form clang-repl
- Update Python’s dictionary with C++ variables
- Find solutions to bring this development into Notebooks and have C++ and Python working together in the same notebook
- Next steps

```bash
./bin/clang-repl
clang-repl> int i = 12;
clang-repl> python
>>> import numpy as np
>>> a = np.asarray([1.1, 2.2, 3.3])
>>> a
array([ 1.1,  2.2,  3.3])
>>> quit()
clang-repl> int j = 10;
```
Task

Integrate Python in clang-repl

```
./bin/clang-repl
clang-repl> int i = 12;
clang-repl> python
>>> import numpy as np
>>> a = np.asarray([1.1, 2.2, 3.3])
>>> a
array([ 1.1,  2.2,  3.3])
>>> quit()
clang-repl> int j = 10;
```
./bin/clang-repl
clang-repl> int i = 12;
Calls a `test.py` script which prints the number of arguments
clang-repl> python_exec_script:
Runs a predefined Python command; normally the command would be passed
along with `simple_command`
clang-repl> simple_command:
(‘This is printed from Python: Today is’, ‘Tue May 24 19:47:05 2022’)
Task

Manage Python’s global dict form clang-repl
Task: Update Python’s dictionary with C++ vars.
Jupyter Notebook magic commands

Polynote

https://github.com/polynote/polynote

Task

Python and C++ in Notebooks options
Next Steps

- **WIP** Update the global dict with var addresses, not value => synchronise updates from both C++ and Python

- Extend beyond `int` type for dict updates

```c
(PyObject *s; s = PyInt_FromLong(value);
```

- Investigate both alternatives (magic commands / Polynote) for working with both Python and C++ in the same Notebook

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Thank you!
- questions -