Then, checkout and install the following packages, in order:

- archinfo
- pyvex (clone with `--recursive`)
- cle
- claripy
- ailment
- angr (`pip install` with `--no-build-isolation`)

2.1.3 Troubleshooting

angr has no attribute Project, or similar

If angr can be imported but the `Project` class is missing, it is likely one of two problems:

1. There is a script named `angr.py` in the working directory. Rename it to something else.
2. There is a folder called `angr` in your working directory, possibly the cloned repository. Change the working directory to somewhere else.

AttributeError: 'module' object has no attribute 'KS_ARCH_X86'

The `keystone` package is installed, which conflicts with the `keystone-engine` package, an optional dependency of angr. Uninstall `keystone` and install `keystone-engine`.

2.2 Reporting Bugs

If you've found something that angr isn't able to solve and appears to be a bug, please let us know!

1. Create a fork off of angr/binaries and angr/angr
2. Give us a pull request with angr/binaries, with the binaries in question
3. Give us a pull request for angr/angr, with testcases that trigger the binaries in `angr/tests/broken_x.py`, `angr/tests/broken_y.py`, etc

Please try to follow the testcase format that we have (so the code is in a test_blah function), that way we can very easily merge that and make the scripts run.

An example is:

```
def test_some_broken_feature():
    p = angr.Project("some_binary")
    result = p.analyses.SomethingThatDoesNotWork()
    assert result == "what it should *actually* be if it worked"

if __name__ == '__main__':
    test_some_broken_feature()
```

This will *greatly* help us recreate your bug and fix it faster.

The ideal situation is that, when the bug is fixed, your testcases passes (i.e., the assert at the end does not raise an AssertionError).

9.1.4 Exploring and analysing states

Choosing a different Exploring strategy

```
simgr.use_technique(angr.exploration_techniques.DFS())
```

Symbolically execute until we find a state satisfying our `find=` and `avoid=` parameters

```
avoid_addr = [0x400c06, 0x400bc7]
find_addr = 0x400c10d
simgr.explore(find=find_addr, avoid=avoid_addr)
```

```
found = simgr.found[0] # A state that reached the find condition from explore
found.solver.eval(sym_arg, cast_to=bytes) # Return a concrete string value for the sym␣
↪arg to reach this state
```

Symbolically execute until lambda expression is `True`

```
simgr.step(until=lambda sm: sm.active[0].addr >= first_jmp)
```

This is especially useful with the ability to access the current STDOUT or STDERR (1 here is the File Descriptor for STDOUT)

```
simgr.explore(find=lambda s: "correct" in s.posix.dumps(1))
```

Memory Managment on big searches (Auto Drop Stashes):

```
simgr.explore(find=find_addr, avoid=avoid_addr, step_func=lambda lsm: lsm.drop(stash=
↪'avoid'))
```

Manually Exploring

```
simgr.step(step_func=step_func, until=lambda lsm: len(sm.found) > 0)

def step_func(lsm):
    lsm.stash(filter_func=lambda state: state.addr == 0x400c06, from_stash='active', to_
↪stash='avoid')
    lsm.stash(filter_func=lambda state: state.addr == 0x400bc7, from_stash='active', to_
↪stash='avoid')
    lsm.stash(filter_func=lambda state: state.addr == 0x400c10, from_stash='active', to_
↪stash='found')
    return lsm
```

Enable Logging output from Simulation Manager:

```
import logging
logging.getLogger('angr.sim_manager').setLevel(logging.DEBUG)
```

property constraints

Returns the constraints of the state stored by the solver.

eval_to_ast(*e*, *n*, *extra_constraints=()*, *exact=None*)

Evaluate an expression, using the solver if necessary. Returns AST objects.

Parameters

- **e** – the expression
- **n** – the number of desired solutions
- **extra_constraints** – extra constraints to apply to the solver
- **exact** – if False, returns approximate solutions

Returns

a tuple of the solutions, in the form of claripy AST nodes

Return type

tuple

max(*e*, *extra_constraints=()*, *exact=None*, *signed=False*)

Return the maximum value of expression *e*.

:param e : expression (an AST) to evaluate :type extra_constraints: :param extra_constraints: extra constraints (as ASTs) to add to the solver for this solve :param exact : if False, return approximate solutions. :param signed : Whether the expression should be treated as a signed value. :return: the maximum possible value of e (backend object)

min(*e*, *extra_constraints=()*, *exact=None*, *signed=False*)

Return the minimum value of expression *e*.

:param e : expression (an AST) to evaluate :type extra_constraints: :param extra_constraints: extra constraints (as ASTs) to add to the solver for this solve :param exact : if False, return approximate solutions. :param signed : Whether the expression should be treated as a signed value. :return: the minimum possible value of e (backend object)

solution(*e*, *v*, *extra_constraints=()*, *exact=None*)

Return True if *v* is a solution of *expr* with the extra constraints, False otherwise.

Parameters

- **e** – An expression (an AST) to evaluate
- **v** – The proposed solution (an AST)
- **extra_constraints** – Extra constraints (as ASTs) to add to the solver for this solve.
- **exact** – If False, return approximate solutions.

Returns

True if *v* is a solution of *expr*, False otherwise

is_true(*e*, *extra_constraints=()*, *exact=None*)

If the expression provided is absolutely, definitely a true boolean, return True. Note that returning False doesn't necessarily mean that the expression can be false, just that we couldn't figure that out easily.

Parameters

- **e** – An expression (an AST) to evaluate
- **extra_constraints** – Extra constraints (as ASTs) to add to the solver for this solve.
- **exact** – If False, return approximate solutions.