Gridworld

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Our group

- Andrew Phan – Project Manager
- Loren Weng – Language Developer
- Kevin Weng – Language Architect
- Zikai Lin – Testing and Validation

Motivation

- Our group loves computer games but none of us really know how to make a game.
- We wanted to learn how games are designed.
- Want to simplify the process for new or inexperienced programmers.
  - Language has to be simple.
  - Language has enough features to form a game. Should tempt the user to actually want to use our language.
- Want to learn the necessary features for a game

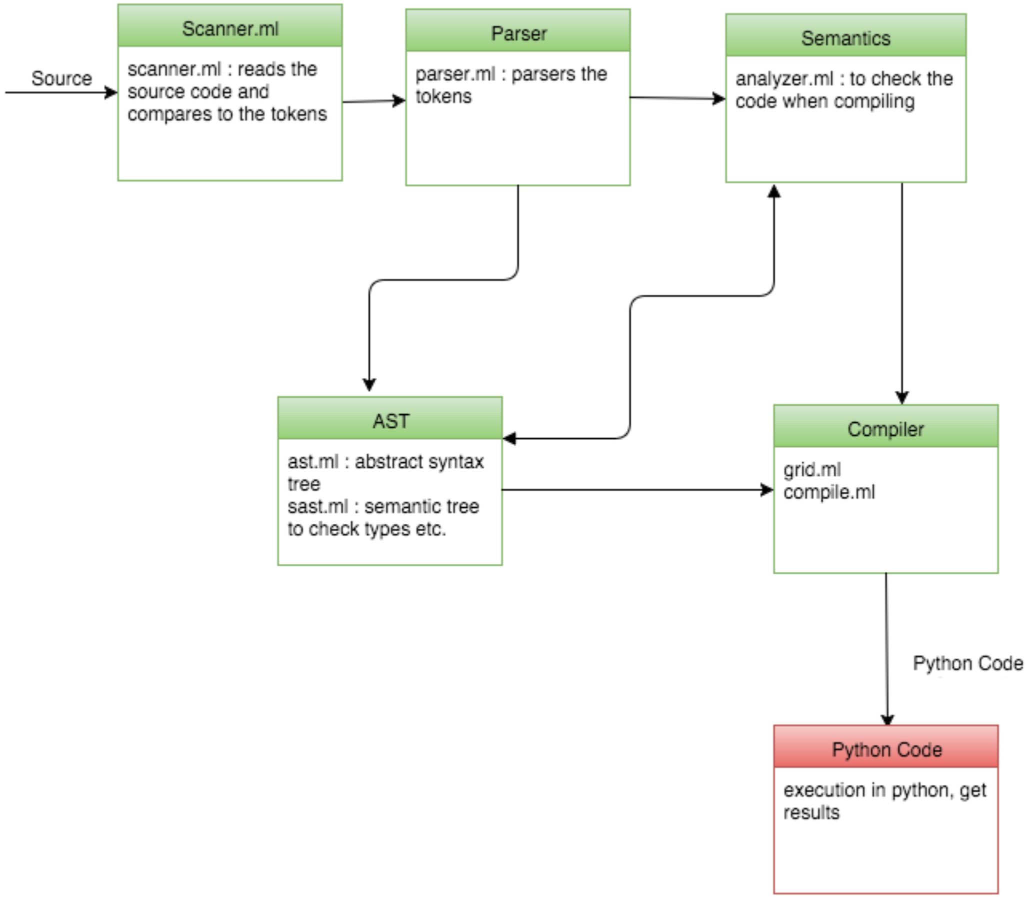
What is Gridworld?

- Node-based language makes game design simple to understand.
  - We have a starting point that leads to more nodes. Much like how a story, movie or game has a beginning and an end.
    - But it is also able to have multiple ending and storylines, which can be chosen by the player.
    - The user can design these game choices by node() and goto().
- Implements basic calculations, logical operations, and control structures.
- Easy to access global variables.
- In one sample game, saves around 400 lines of code.

Supported Language Features

Functions	Types	Control / Loops
Node	Int	If / Else / elif
Class	String	While
print	Bool	Return
Read (readStr, readInt)		
List		
Choose		
goto		
roll		

Language Architecture


Source
Scanner.ml
scanner.ml : reads the source code and compares to the tokens
Parser
parser.ml : parsers the tokens
Semantics
analyzer.ml : to check the code when compiling
AST
ast.ml : abstract syntax tree
sast.ml : semantic tree to check types etc.
Compiler
grid.ml
compile.ml
Python Code
Python Code
execution in python, get results

Testing

- Regression Test Suite is similar to the microc compiler.
  - Small test components to test each individual case.
  - Aimed for at least 40 simple tests.
    - Compare both expected output and the execution of compiled Python code
  - Long and tedious process.
    - Initially many things didn't work. When we added functionality, other things would break. Example was adding our node based implementation broke many tests.

Conclusion

- Gridworld is a language designed to teach inexperienced programmers about simple game development.
- Ocaml is not for normal people.
  - Creating a language is difficult and consumes a lot of time.
  - Appreciate languages now and know why there are so many of them.
  - Horses for courses. Languages are good/bad for different applications.
    - Reason why people use C++ when they need speed.
- Group learned how to use Ocaml, debugging, Trello, Github and Latex for PDF creation etc.
- Hard to coordinate and manage jobs for people. And some advice for other:
  - Don’t code till the very last minute. Something always comes up.
  - Meet up every week especially if you are not busy.
  - Use your TA and professor.
  - Talk to other CS students.

Demo