Name and Contact Information

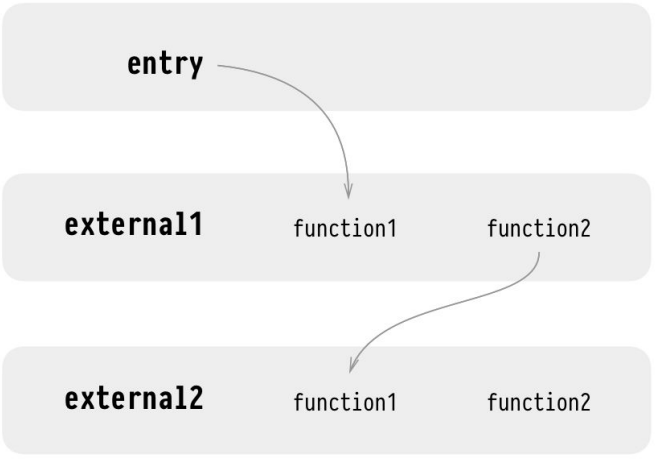
Full name: Chen Duzhong
Nickname: Vincent Chan
E-mail: okcdz@diverse.space
Telephone: (+86)132-8849-0656
Github: https://github.com/vincentdchan/

Title

Deep Scope Analysis

Description

I want to contribute to Webpack project by implementing one of the proposed ideas, namely “Deep Scope Analysis”. The program will traverse the ASTs to analyze all the scopes in modules. Hence, it can distinguish unused exported variables and functions. Then Webpack can do tree-shaking from these informations to reduce the size of bundle.



In the above example, the output bundle should **only** include **`external1.function1`**. But currently Webpack will include other unused variables in the output bundle because it can’t distinguish whether a variable is referenced. We can infer whether a variable is referenced from other modules by deep scope analysis. If an exported function/variable is not referenced, it will not be included in the output bundle.

Benefits to Community

Webpack is a widely used packing tool. It's strong and powerful. But it isn't support deep scope analysis now. So it can't do tree-shaking. Tree-shaking can help user to remove the unnecessary code and reduce the size of bundle. It's a very important feature for the frontend development.

Deliverables

I tried to structure the contributions to Deep Scope Analysis as part of GSoC program into several core steps:

- Write a plugin and adapt escope to Webpack DONE
- Determine what information are needed for Deep Scope Analysis DONE
- Use the informations in ScopeManager to generate dependency graph for modules and functions
- Use the informations to determine what modules and functions is needed, which is called tree-shaking
- Write tests for the plugin

Related Work

escope
escope is a scope analyzer for ECMAScript. It get all the scope and references informations by traversing the ASTs.

Biographical Information

I am interested in the frontend development. I had an internship of frontend engineering in Bytedance Inc. I have written babel plugin to analyze code in my internship. And I am working on a babel PR about the *pattern matching* feature: https://github.com/babel/babel/pull/6761. And I am a fans of webpack and I hope to contribute to it. And I am also interested in ASTs analysis and transforming.