

```

1  use std::{io::stderr, ops::Deref};
2  use swc::{Compiler, config::SourceMapsConfig};
3  use swc_ecma_parser::{lexer::Lexer, Syntax, EsConfig, StringInput, Parser};
4  use swc_common::{sync::Lrc, errors::Handler, SourceMap, FileName, SourceFile, DUMMY_SP};
5  use swc_ecma_ast::{EsVersion, Module, ModuleItem, Stmt, Decl, FnDecl, Ident, Function};
6  use swc_ecma_ast::{ReturnStmt, BlockStmt, Expr, BinExpr, BinaryOp, Lit, Number};
7
8  /// init ast generate function
9
10 type MyLexer<'a> = Lexer<'a, StringInput<'a>>;
11
12 type MyParser<'a> = Parser<MyLexer<'a>>;
13
14 fn init_compiler() -> (Lrc<SourceMap>, Compiler) {
15     let cm: Lrc<SourceMap> = Default::default();
16     let compiler = Compiler::new(cm.clone());
17     return (cm.clone(), compiler);
18 }
19
20 fn init_file(cm: Lrc<SourceMap>, src: String) -> Lrc<SourceFile> {
21     let filename = FileName::Custom("dummy_file.js".into());
22     let fm = cm.new_source_file(filename, src.into());
23     return fm;
24 }
25
26 fn init_lexer(fm: &SourceFile) -> MyLexer {
27     let lexer = Lexer::new(
28         Syntax::Es(EsConfig {
29             jsx: false,
30             fn_bind: false,
31             decorators: true,
32             decorators_before_export: false,
33             export_default_from: false,
34             import_assertions: false,
35             static_blocks: false,
36             private_in_object: false,
37             allow_super_outside_method: false,
38         }),
39         EsVersion::Es2016,
40         StringInput::from(fm),
41         None,
42     );
43     return lexer;
44 }
45
46 fn init_parser<'a>(lexer: MyLexer<'a>, compiler: &'a Compiler) -> MyParser<'a> {
47     let mut parser = Parser::new_from(lexer);
48
49     let _handler = Handler::with_emitter_writer(Box::new(stderr()), Some(compiler.cm.clone()));
50     let list_error = parser.take_errors();
51     if list_error.iter().len() > 0 {
52         let mut err_msg = "".to_owned();
53         for err in list_error {
54             let msg = err.into_kind().msg().to_string();
55             err_msg.push_str(msg.as_str());
56         }
57     }
58
59     return parser;
60 }
61
62
63 /// do parse and transform action
64
65 fn parser_parse(mut parser: MyParser, show_ast: bool) -> Module {
66     let module = parser.parse_module().unwrap();
67     println!("{}", "parse success\n");
68
69     let ast = serde_json::to_string_pretty(&module).expect("failed to serialize");
70
71     if show_ast {
72         println!("{}", "ast json is\n{}\n", ast);
73     }
74
75     return module;
76 }
77
78 fn ast_transform(module: Module, f: fn(Module) -> Module) -> Module {
79     return f(module);
80 }
81
82 fn print_result(compiler: Compiler, module: &Module) {
83     let result = compiler.print(
84         module,
85         None,
86         None,
87         false,
88         EsVersion::Es2016,
89         SourceMapsConfig::Bool(false),
90         &Default::default(),
91         None,
92         false,
93         None,
94     ).unwrap();
95
96     println!("{}", "generate success\n");
97
98     println!("{}", "generate code\n{}\n", result.code)
99 }
100
101 /// define your own ast code

```

```

102
103 type SpecifierInfo = Vec<(String, String, f64)>;
104
105 fn calc_rtn_literal_number(module: &Module) -> SpecifierInfo {
106     let mut specifiers = vec![];
107     for item in &module.body {
108         if let ModuleItem::Stmt(Stmt::Decl(Decl::Fn(fn_struct))) = item {
109             let fn_struct_str = format!("{:?}", &fn_struct);
110             let func_name = &fn_struct.ident.sym.to_string();
111             let func_body = &fn_struct.function.body;
112
113             if let Some(block_stmt) = func_body {
114                 if block_stmt.stmts.iter().len() == 1 {
115                     let this_block_stmt = block_stmt.stmts.iter().next();
116                     if let Some(rtn_stmt) = this_block_stmt {
117                         if let Stmt::Return(ReturnStmt { arg, .. }) = rtn_stmt {
118                             if let Some(expr) = arg {
119                                 let this_expr = expr.deref();
120                                 if let Expr::Bin(BinExpr { op, left, right, .. }) = this_expr {
121                                     if &BinaryOp::Add == op {
122                                         let l_expr = left.deref();
123                                         if let Expr::Lit(Lit::Num(Number { value: lv, .. })) = l_expr {
124                                             let r_expr = right.deref();
125                                             if let Expr::Lit(Lit::Num(Number { value: rv, .. })) = r_expr {
126                                                 let (add_left, add_right) = (*lv, *rv);
127                                                 specifiers.push((func_name.clone(), fn_struct_str, add_left + add_right));
128                                             }
129                                         }
130                                     }
131                                 }
132                             }
133                         }
134                     }
135                 }
136             }
137         }
138     }
139
140     for item in &specifiers {
141         let (func_name, _fn_struct_str, rtn_number) = item;
142         println!("func_name: {}, rtn_number: {}", func_name, rtn_number);
143     }
144
145     if specifiers.iter().len() > 0 {
146         println!();
147     }
148
149     return specifiers;
150 }
151
152 fn replace_literal_number(module: &Module, specifiers: SpecifierInfo) -> Module {
153     let mut build_module = Module {
154         span: DUMMY_SP,
155         body: vec![],
156         shebang: module.shebang.clone(),
157     };
158
159     let stat_temp = |stmt| { ModuleItem::Stmt(stmt) };
160     let decl_temp = |decl| { stat_temp(Stmt::Decl(decl)) };
161     let fn_temp = |fn_struct| { decl_temp(Decl::Fn(fn_struct)) };
162
163     for item in &module.body {
164         let mut same_name_struct = false;
165         let mut rtn_number = 0 as f64;
166
167         match item {
168             ModuleItem::Stmt(stmt) => {
169                 match stmt {
170                     Stmt::Decl(decl) => {
171                         match decl {
172                             Decl::Fn(fn_struct) => {
173                                 let this_fn_struct_str = format!("{:?}", &fn_struct);
174                                 let this_func_name = &fn_struct.ident.sym.to_string();
175
176                                 for spec in specifiers.iter() {
177                                     let (fn_name, fn_struct_str, rtn_value) = spec;
178                                     if (fn_name == this_func_name) && (&this_fn_struct_str == &fn_struct_str) {
179                                         same_name_struct = true;
180                                         rtn_number = *rtn_value;
181                                     }
182                                 }
183
184                                 if same_name_struct {
185                                     let literal_number = Expr::Lit(Lit::Num(Number { span: DUMMY_SP, value: rtn_number }));
186                                     let literal_node = Stmt::Return(ReturnStmt { span: DUMMY_SP, arg: Some(Box::from(literal_number)) });
187                                     let new_fn_struct = FnDecl {
188                                         ident: Ident {
189                                             span: DUMMY_SP,
190                                             sym: fn_struct.ident.sym.clone(),
191                                             optional: fn_struct.ident.optional.clone(),
192                                         },
193                                         declare: fn_struct.declare.clone(),
194                                         function: Function {
195                                             params: fn_struct.function.params.clone(),
196                                             decorators: fn_struct.function.decorators.clone(),
197                                             span: DUMMY_SP,
198                                             body: Some(BlockStmt { span: DUMMY_SP, stmts: vec![literal_node] }),
199                                             is_generator: fn_struct.function.is_generator.clone(),
200                                             is_async: fn_struct.function.is_async.clone(),
201                                             type_params: fn_struct.function.type_params.clone(),
202                                             return_type: fn_struct.function.return_type.clone(),
203                                         },
204                                     };
205                                 }
102
103 type SpecifierInfo = Vec<(String, String, f64)>;
104
105 fn calc_rtn_literal_number(module: &Module) -> SpecifierInfo {
106     let mut specifiers = vec![];
107     for item in &module.body {
108         if let ModuleItem::Stmt(Stmt::Decl(Decl::Fn(fn_struct))) = item {
109             let fn_struct_str = format!("{:?}", &fn_struct);
110             let func_name = &fn_struct.ident.sym.to_string();
111             let func_body = &fn_struct.function.body;
112
113             if let Some(block_stmt) = func_body {
114                 if block_stmt.stmts.iter().len() == 1 {
115                     let this_block_stmt = block_stmt.stmts.iter().next();
116                     if let Some(rtn_stmt) = this_block_stmt {
117                         if let Stmt::Return(ReturnStmt { arg, .. }) = rtn_stmt {
118                             if let Some(expr) = arg {
119                                 let this_expr = expr.deref();
120                                 if let Expr::Bin(BinExpr { op, left, right, .. }) = this_expr {
121                                     if &BinaryOp::Add == op {
122                                         let l_expr = left.deref();
123                                         if let Expr::Lit(Lit::Num(Number { value: lv, .. })) = l_expr {
124                                             let r_expr = right.deref();
125                                             if let Expr::Lit(Lit::Num(Number { value: rv, .. })) = r_expr {
126                                                 let (add_left, add_right) = (*lv, *rv);
127                                                 specifiers.push((func_name.clone(), fn_struct_str, add_left + add_right));
128                                             }
129                                         }
130                                     }
131                                 }
132                             }
133                         }
134                     }
135                 }
136             }
137         }
138     }
139
140     for item in &specifiers {
141         let (func_name, _fn_struct_str, rtn_number) = item;
142         println!("func_name: {}, rtn_number: {}", func_name, rtn_number);
143     }
144
145     if specifiers.iter().len() > 0 {
146         println!();
147     }
148
149     return specifiers;
150 }
151
152 fn replace_literal_number(module: &Module, specifiers: SpecifierInfo) -> Module {
153     let mut build_module = Module {
154         span: DUMMY_SP,
155         body: vec![],
156         shebang: module.shebang.clone(),
157     };
158
159     let stat_temp = |stmt| { ModuleItem::Stmt(stmt) };
160     let decl_temp = |decl| { stat_temp(Stmt::Decl(decl)) };
161     let fn_temp = |fn_struct| { decl_temp(Decl::Fn(fn_struct)) };
162
163     for item in &module.body {
164         let mut same_name_struct = false;
165         let mut rtn_number = 0 as f64;
166
167         match item {
168             ModuleItem::Stmt(stmt) => {
169                 match stmt {
170                     Stmt::Decl(decl) => {
171                         match decl {
172                             Decl::Fn(fn_struct) => {
173                                 let this_fn_struct_str = format!("{:?}", &fn_struct);
174                                 let this_func_name = &fn_struct.ident.sym.to_string();
175
176                                 for spec in specifiers.iter() {
177                                     let (fn_name, fn_struct_str, rtn_value) = spec;
178                                     if (fn_name == this_func_name) && (&this_fn_struct_str == &fn_struct_str) {
179                                         same_name_struct = true;
180                                         rtn_number = *rtn_value;
181                                     }
182                                 }
183
184                                 if same_name_struct {
185                                     let literal_number = Expr::Lit(Lit::Num(Number { span: DUMMY_SP, value: rtn_number }));
186                                     let literal_node = Stmt::Return(ReturnStmt { span: DUMMY_SP, arg: Some(Box::from(literal_number)) });
187                                     let new_fn_struct = FnDecl {
188                                         ident: Ident {
189                                             span: DUMMY_SP,
190                                             sym: fn_struct.ident.sym.clone(),
191                                             optional: fn_struct.ident.optional.clone(),
192                                         },
193                                         declare: fn_struct.declare.clone(),
194                                         function: Function {
195                                             params: fn_struct.function.params.clone(),
196                                             decorators: fn_struct.function.decorators.clone(),
197                                             span: DUMMY_SP,
198                                             body: Some(BlockStmt { span: DUMMY_SP, stmts: vec![literal_node] }),
199                                             is_generator: fn_struct.function.is_generator.clone(),
200                                             is_async: fn_struct.function.is_async.clone(),
201                                             type_params: fn_struct.function.type_params.clone(),
202                                             return_type: fn_struct.function.return_type.clone(),
203                                         },
204                                     };
205                                 }

```

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206         build_module.body.push(fn_temp(new_fn_struct))
207     } else {
208         build_module.body.push(fn_temp((*fn_struct).clone()))
209     }
210 }
211 _ => { build_module.body.push(decl_temp((*decl).clone())) }
212 }
213 }
214 _ => { build_module.body.push(stat_temp((*stmt).clone())) }
215 }
216 }
217 _ => { build_module.body.push((*item).clone()) }
218 }
219 }
220
221 return build_module;
222 }
223
224
225 fn my_ast_func(module: Module) -> Module {
226     let specifiers = calc_rtn_literal_number(&module);
227     let build_module = replace_literal_number(&module, specifiers);
228     return build_module;
229 }
230
231
232 fn main() {
233     let dummy_js = "function calc(){return 1+2;}".into();
234
235     let (cm, compiler) = init_compiler();
236     let fm = init_file(cm, dummy_js);
237     let lexer = init_lexer(&fm.deref());
238     let parser = init_parser(lexer, &compiler);
239
240     let mut module = parser_parse(parser, false);
241     module = ast_transform(module, my_ast_func);
242     print_result(compiler, &module);
243
244     let _stdout_str = "\
245 >>>> parse success
246
247 func_name: calc, rtn_number: 3
248
249 >>>> generate success
250
251 >>>> generate code
252
253 function calc() {
254     return 3;
255 }
256
257 ";
258 }

```