Compilers and Languages

Team 19

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- The language is close to JavaScript

- The file test.js contains examples of statements that pass parsing

- To build: `make build`, to run test.js: `make run`

Allowed Keywords:

if, while, do, const, else, switch, case, default, print, function, return, enum, continue, break, for

Allowed Syntax:

Variable declaration:

VARIABLE '=' expr ';'

- VARIABLE is a variable name
- expr is a value that can be assigned to the variable, it can be a function call, integer, string, another variable, logical, or mathematical expression
- Variable names start with capital or small alphabetical characters, then any sequence of alphanumeric characters as well as underscore.

- Example:

```
varname = 10;
```

Const declaration:

const VARIABLE '=' expr ';'

- Example:

```
const x = 10;
```

If statement:

if '(' expr ')' stmt

if '(' expr ')' stmt else stmt

- stmt:
  - can be an assignment statement, enum declaration, if statement, switch statement, while, for, do statements, or function declaration. It can also be a list of statements encapsulated by '{' and '}'
  - It ends with a semi colon (if not list of statements)

- Example:

```
if (x == 2){
      print (x);
}
else{
      print (0);
}
```

While statement:

while '(' expr ')' stmt

- Example:

```
while(foo > 5){
      print (foo);
      foo = foo - 1;
}
```

For statement:

for '(' assignment_stmt ';' expr ';' assignment_stmt ')' stmt

for '(' assignment_stmt ';' expr ';' expr ')' stmt

- assignment_stmt is used for assigning variables at the beginning of the loop. It needs to be first argument of for loop

- Example:

```
for (i = 0; i < 5; i = i + 1){
    print (i);
}
```

Do while statement (instead of repeat until):

do stmt while '(' expr ')' ';'

- Example:

```
do {
    print (foo);
    foo = foo - 1;
} while (foo > 5);
```

Function declaration:

function VARIABLE '(' var_list ')' '{' stmt_list '}'

function VARIABLE '(' var_list ')' ';'

function VARIABLE '(' var_list ')' '{' stmt_list RETURN expr ';''}'

- var_list is a comma-sperated list of variable names
- Here VARIABLE is the function name, it follows the rules of defining a variable
- Can make function declaration without its body
- Return statemnet is optional

- Example:

```
function test(){
    print (foo);
}
```

Function Call:

VARIABLE '(' param_list ')'

- Here: VARIABLE is a function name
- parameters list is a list of expressions (expr) seperated by commas

- Example:

```
test();
test2(10, 20, 40);
```

Enum variable:

'{' var_list '}'

- var_list: is a list of comma sepearted VARIABLE names
- Each variable name will be assigned a value, starting from 0

- Example:

```
{A, B, C}; // Here: A=0, B=1, C=2
```

Switch statement:

switch *'(' expr ')' '{' case_list '}'*

case_list can be one of the following:

CASE expr ':' stmt

DEFAULT ':' stmt

- if multiple statements are to be put inside case, they need to be inside culry braces '{' and '}'

- Example:

```
switch (x){
    case 1:
    {
        print (1);
        print(1);
    }
```

```
        case 2:
                print (2);

        default:
                print (0);
}
```

Comments:

```
// This is a comment
```