report

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实验过程

1. 在 `lexer/lexer.l` 模板的基础上完成更多的 `token`：

   注：实验模板欠缺一下 `token`：

   ```
   token      name

   float      float
   ...        ellipsis
   ```

2. 在 `lexer/lexer.l` 中增加 `genflag()` 函数，处理无关字符 `[StartOfLine]` `[LeadingSpace]`：

   思路：增加全局变量 `yynewline`、`yynewspace` 用于标记新行、新空格，分情况设置 `flag`：

   ```
   if(yynewline && yynewspace){
     flag = " [StartOfLine] [LeadingSpace]";
   }
   else if(yynewline){
     flag = " [StartOfLine]";
   }
   else if(yynewspace){
     flag = " [LeadingSpace]";
   }
   else{
     flag = "";
   }
   ```

3. 挑战方向：扩展更多 C 语言的 `token`

   - 踩过的坑：

     - 不支持数据类型 `bool`，`Clang` 将其识别为 `identifier`；
     - 不需要写 `long long` 类型对应的规则，`Clang` 将其识别为两个 `long`。

   - 更多 `token`：

     ```
     token      name

     :          colon
     auto       auto
     double     double
     long       long
     enum       enum
     register   register
     short      short
     signed     signed
     ```

```
11   unsigned      unsigned
12   static        static
13   struct        struct
14   union         union
15   typedef       typedef
16   do            do
17   switch        switch
18   case          case
19   default       default
20   for           for
21   goto          goto
22   sizeof        sizeof
23   extern        extern
24   ++            plusplus
25   +=            plusequal
26   --            minusminus
27   -=            minusequal
28   *=            starequal
29   /=            slashequal
30   %=            percentequal
```

4. 根据新扩展的 `token`，编写新的测例 `tester/mytest.c` 和评测脚本 `lexer/mytest.sh`。

难点

设计字符串的正则表达式

1. 初始版本 `\"[^"]\"`：
   - 思路：不允许字符串中单独出现 `"`
   - 缺点：出现 `\"` 不被允许
2. 最终版本 `\"([^\"\\]|\\.)*\"`
   - 思路：`|` 左边规定：不允许单独出现 `"` 和 `\`；右边规定：`\` 的后面需要带任意字符（`\n` 除外）

设计小数的正则表达式

总共有三种表示：

1. 十进制小数点计数法
2. e-计数法
3. p-计数法

自动评测结果

0

1

```
1  ( export PATH=$HOME/sysu/bin:$PATH \
2    CPATH=$HOME/sysu/include:$CPATH \
3    LIBRARY_PATH=$HOME/sysu/lib:$LIBRARY_PATH \
4    LD_LIBRARY_PATH=$HOME/sysu/lib:$LD_LIBRARY_PATH &&
5    sysu-compiler --unittest=lexer-0 "**/*.sysu.c" )
```

```
[626/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/hoist-3.sysu.c
[627/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/instruction-combining-1.sysu.c
[628/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/instruction-combining-2.sysu.c
[629/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/instruction-combining-3.sysu.c
[630/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/integer-divide-optimization-1.sysu.c
[631/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/integer-divide-optimization-2.sysu.c
[632/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/integer-divide-optimization-3.sysu.c
[633/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/median0.sysu.c
[634/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/median1.sysu.c
[635/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/median2.sysu.c
[636/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/shuffle0.sysu.c
[637/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/shuffle1.sysu.c
[638/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/shuffle2.sysu.c
[639/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/sl1.sysu.c
[640/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/sl2.sysu.c
[641/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/sl3.sysu.c
[642/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/stencil0.sysu.c
[643/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/stencil1.sysu.c
[644/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/transpose0.sysu.c
[645/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/transpose1.sysu.c
[646/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/transpose2.sysu.c
root@21a56bf57171:/workspace/SYsU-lang#
```

2

```
1  ( export PATH=$HOME/sysu/bin:$PATH \
2    CPATH=$HOME/sysu/include:$CPATH \
3    LIBRARY_PATH=$HOME/sysu/lib:$LIBRARY_PATH \
4    LD_LIBRARY_PATH=$HOME/sysu/lib:$LD_LIBRARY_PATH &&
5    sysu-compiler --unittest=lexer-1 "**/*.sysu.c" )
```

```
[626/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/hoist-3.sysu.c
[627/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/instruction-combining-1.sysu.c
[628/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/instruction-combining-2.sysu.c
[629/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/instruction-combining-3.sysu.c
[630/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/integer-divide-optimization-1.sysu.c
[631/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/integer-divide-optimization-2.sysu.c
[632/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/integer-divide-optimization-3.sysu.c
[633/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/median0.sysu.c
[634/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/median1.sysu.c
[635/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/median2.sysu.c
[636/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/shuffle0.sysu.c
[637/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/shuffle1.sysu.c
[638/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/shuffle2.sysu.c
[639/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/sl1.sysu.c
[640/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/sl2.sysu.c
[641/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/sl3.sysu.c
[642/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/stencil0.sysu.c
[643/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/stencil1.sysu.c
[644/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/transpose0.sysu.c
[645/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/transpose1.sysu.c
[646/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/transpose2.sysu.c
root@21a56bf57171:/workspace/SYsU-lang#
```

```
1  ( export PATH=$HOME/sysu/bin:$PATH \
2    CPATH=$HOME/sysu/include:$CPATH \
3    LIBRARY_PATH=$HOME/sysu/lib:$LIBRARY_PATH \
4    LD_LIBRARY_PATH=$HOME/sysu/lib:$LD_LIBRARY_PATH &&
5    sysu-compiler --unittest=lexer-2 "**/*.sysu.c" )
```

```
[626/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/hoist-3.sysu.c
[627/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/instruction-combining-1.sysu.c
[628/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/instruction-combining-2.sysu.c
[629/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/instruction-combining-3.sysu.c
[630/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/integer-divide-optimization-1.sysu.c
[631/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/integer-divide-optimization-2.sysu.c
[632/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/integer-divide-optimization-3.sysu.c
[633/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/median0.sysu.c
[634/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/median1.sysu.c
[635/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/median2.sysu.c
[636/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/shuffle0.sysu.c
[637/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/shuffle1.sysu.c
[638/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/shuffle2.sysu.c
[639/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/sl1.sysu.c
[640/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/sl2.sysu.c
[641/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/sl3.sysu.c
[642/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/stencil0.sysu.c
[643/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/stencil1.sysu.c
[644/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/transpose0.sysu.c
[645/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/transpose1.sysu.c
[646/647] tester/third_party/SYsU-lang-tester-perfermance/performance_test2022-public/transpose2.sysu.c
root@21a56bf57171:/workspace/SYsU-lang#
```

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汇总

新的测例评测结果

```
1  ( export PATH=$HOME/sysu/bin:$PATH \
2    CPATH=$HOME/sysu/include:$CPATH \
3    LIBRARY_PATH=$HOME/sysu/lib:$LIBRARY_PATH \
4    LD_LIBRARY_PATH=$HOME/sysu/lib:$LD_LIBRARY_PATH &&
5    sysu-compiler --unittest=lexer-0 "../tester/mytest.c" &&
6    sysu-compiler --unittest=lexer-1 "../tester/mytest.c" &&
7    sysu-compiler --unittest=lexer-2 "../tester/mytest.c" &&
8    sysu-compiler --unittest=lexer-3 "../tester/mytest.c" &&
9    echo mytest pass!)
```

PROBLEMS   OUTPUT   DEBUG CONSOLE   **TERMINAL**   PORTS

```
root@21a56bf57171:/workspace/SYsU-lang/lexer# ./mytest.sh
[0/1] ../tester/mytest.c
[0/1] ../tester/mytest.c
[0/1] ../tester/mytest.c
[0/1] ../tester/mytest.c
mytest pass!
```