SE232, Autumn 2018
Lab 1: Calculator
Assigned: Sept. 28
Due: Oct. 17

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Introduction:

In lab1, we will implement a calculator with the help of the textbook. For details, reference the sixth and seventh chapters. Complete the additional functions on the sample of the textbook.

Requirements:

0. Implement and run the sample program (6.9) in the course and understand the structure and function of the program.

```cpp
class Token{/*...*/};
class Token_stream {/*...*/};

Token_stream::Token_stream():full(false),buffer(0){/*...*/}
void Token_stream::putback(Token t){/*...*/}
Token Token_stream::get(){/*...*/}

Token_stream ts;
double expression();

double primary(){/*...*/}
double term(){/*...*/}
double expression(){/*...*/}

int main(){/*...*/}
```

1. Your file's name should be named *{Your Student ID}.cpp*. Your file can read the content of *input.txt* and generate the result *output.txt* in the same subdirectory.
2. (**basic**) Implement and run the *calculator* sample program (7.3-7.6) and complete the *calculate* function, which will be able to:
   a) Cope with error message;
   b) Implement error recovery;
   c) Cope with negative number;
   d) Cope with modular operation(%);

3. (**advanced**)Modify the program, which will be able to:

a) Cope with factorial operation(!). Note the operator precedence and 0!=1;

b) Implement a key word *ANS(The initial value is 0)*, which can store the last calculation result. For example, the content of *input.txt* is,

📄 input.txt

文件(F) 编辑

```
0!;
1+2*3-1;
ANS+2;
```

And the *output.txt* will be,

📄 output.txt ·

文件(F) 编辑(E)

```
1
6
8
```

Evaluation

1. Cheaters will receive 0 point.

2. Basic function has 16 test cases; advanced function has 10. For each test case a fixed score (5) is assigned such that the scores for each task summed to 130. This score is awarded to the program yielding a correct result for the case; otherwise no score is awarded. There are some test cases in *lab1_input.txt* and corresponding results in *lab1_output.txt.* Please comply with the format of *input.txt* and *output.txt* in *lab1_input.txt* and *lab1_output.txt*. If your format of *output.txt* is not specific with the requirement, you will get 0 point.

3. Code comments and code style have 20 points.
   Reference: Google C++ Style Guide