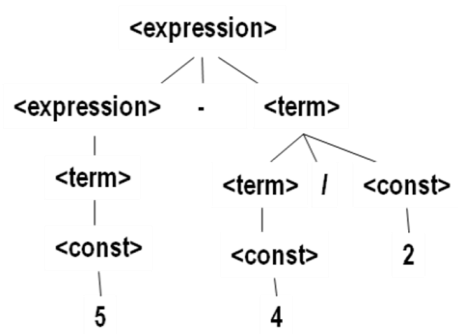
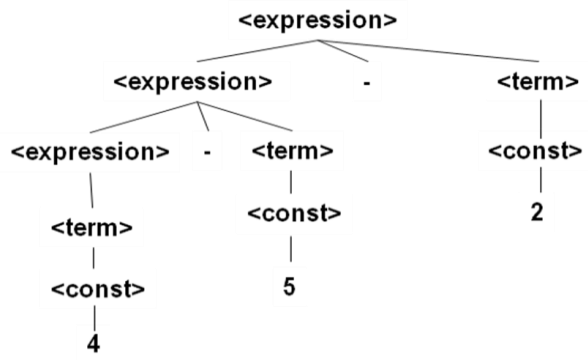
İZMİR UNIVERSITY OF ECONOMICS
DEPARTMENT OF SOFTWARE ENGINEERING
SE311 SPRING 2017-2018 / Dr. Ufuk Çelikkan
HOMEWORK
DUE March 20.

1. A parse tree which is generated by the compiler is a hierarchical representation of the syntactic structure of your programs. It is basically a tree that contains leaf and non leaf nodes. The following two examples represent the syntactic structure of the C expressions 5-4/2 and 4-5-2.





A parse tree is generated using BNF grammar rules. An example grammar is given below
<expression> → <expression> - <term> | <term>
<term> → <term> / <const>| <const>
<const>→1|2|3|4|5|6|7|8|9|0
Repeated applications of the rules create the parse tree. For example the rule <expression> → <expression> - <term> tells us that an expression contains an **expression**, a minus sign ("-"), followed by a **term**. **term** contains another **term** followed by division symbol **("/")**, followed by another **term**. A **term** can also contain just a **const**.

1. Create simple parse trees using Composite pattern for the examples given above
2. Each node will have either one or three children.
3. Display the example arithmetic expressions given above in your output (i.e. **5-4/2**) . You shall be using Iterator pattern.
4. Evaluate the expressions and print the result (i.e. **5-4/2 = 3)**. You shall be using Iterator pattern.
5. In case of ambiguities in the problem specification, make your assumptions logically, clearly and consistently.
6. You can develop your code on any IDE. However, your programs must be able to be compiled using g++ on Linux. This means, do not use non-standard header files or libraries.
7. Give me a print out of your ".cpp" file (if you can avoid using a header file (*.h) file please do not use)
8. E-mail your homework. Please the follow the same guidelines as in your lab submission.
9. Make the Subject: SE311_2017_2018_HWK1