

Sinirli Turkce Programlama Dili Derleyicisi - SiNiR

CmpE 150.03 Introduction to Computing, Fall 2020
Homework 5 – Due: 28/12/2020, 23.59

In this homework, you are going to implement the SiNiR compiler. The details are as follows:

Given a file named **calc.in**, your program should check whether there are any syntax errors.

- There will always be a file named **calc.in**
- There will be no tab character in the file.
- If there is a syntax error,
 - Create a new file, named **calc.out** and print “Dont Let Me Down” inside.
- If there are no syntax errors,
 - Create a new file, named **calc.out** and print “Here Comes the Sun” inside.
- Do not print out anything to the terminal in the submitted file.

calc.in is composed of three parts. If one of those parts are missing, there is a syntax error.

```
AnaDegiskenler
<init-statement>
<init-statement>
<init-statement>
....
YeniDegiskenler
<mid-statement>
<mid-statement>
<mid-statement>
.....
Sonuc
<final-statement>
```

The general structure of **calc.in** should be in the following form:

- Empty lines are allowed anywhere in the file.
- Spaces are allowed at any point unless specified. There should be no space in the shaded sequences. For example, there might be space before **AnaDegiskenler** or after; however there should be no space between **<digit>.<digit>**.
- The file should start with the **AnaDegiskenler** statement. If not, there is a syntax error.
- There are zero or more **<init-statement>**s after **AnaDegiskenler** statement. Each **<init-statement>** should be in a single line. If not, there is a syntax error.
- The file then continues with the **YeniDegiskenler** statement. If not, there is a syntax error.
- There are zero or more **<mid-statement>**s after the **YeniDegiskenler** statement. Each **<mid-statement>** should be in a single line. If not, there is a syntax error.
- The file continues with the **Sonuc** statement. If not, there is a syntax error.
- There is zero or one **<final-statement>** after the **Sonuc** statement. **<final-statement>** should be in a single line. If not, there is a syntax error.

Important:

- The language is case sensitive.
- Keywords cannot be used as variable names.

<init-statement>

- Any number of spaces (including space and tab) are allowed in <init-statement>
- <var-name> is composed of at most ten alpha-numeric characters
- The same variable cannot be assigned more than once.
- <value> := <a-term> | <l-term>
 - the above line means that <value> can be <a-term> or <l-term>
- <a-term> := <digit> | <digit>.<digit> | <t-digit> | <t-digit> nokta <t-digit>
- <digit> := 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9
- <t-digit> := sifir | bir | iki | uc | dort | bes | alti | yedi | sekiz | dokuz
- <l-term> := dogru | yanlis
- If above rules do not hold, it's syntax error.

<mid-statement>

- is constructed by
 - <var-name> degeri <expression> olsun
- Any number of spaces are allowed in <mid-statement>
- <var-name> is composed of at most ten alpha-numeric characters
- the same variable cannot be assigned more than once.
- <expression> := <arith-expr> | <logic-expr>
 - i.e. <expression> should be either <arith-expr> or <logic-expr>
- <var-name> will be of type float if it is <arith-expr>
- <var-name> will be of type boolean if it is <logic-expr>
- <arith-expr> := <open-paran> <arith-expr> <close-paran>
 - := <arith-expr> <binaop> <arith-expr>
 - := <a-term>
 - := <a-var-name>
- <open-paran> := (| ac-parantez
- <close-paran> :=) | kapa-parantez
- <binaop> := + | - | * | arti | eksi | carpi
- <a-var-name> should represent a variable of type int or float
- <a-var-name> should be defined in the previous lines.
- <logic-expr> := <open-paran> <logic-expr> <close-paran>
 - := <logic-expr> <binlop> <logic-expr>
 - := <l-term>
 - := <l-var-name>
- <binlop> := ve | veya
- <l-var-name> should represent a variable of type boolean
- <l-var-name> should be defined in the previous lines.
- If above rules do not hold, it's syntax error.

<final-statement>

- is constructed by:
 <expression>
- The same rules for <expression> apply (as above).
- Any number of spaces are allowed in <final-statement>
- If above rules do not hold, there is a syntax error.

Submission: You will submit a single python file over Moodle. Your .py file should be named with the underscore character (_) followed by your student number (e.g. _2019700030.py).

Your homework will be evaluated in different categories so that you can collect **partial points**:

A	Correctly parse the file without any <init-statement>, <mid-statement>, <final-statement>	+5	If the code fails in this test case, the absolute grade will be zero
B	Correctly parse <init-statement>s composed of only integers	+10	
C	Correctly parse <init-statement> composed of combination of integers, floats and booleans	+15	
D	Correctly parse <mid-statement>s composed of only integers	+10	No variable is used on the right side of the statement (after degeri)
E	Correctly parse <mid-statement>s composed of combination of integers, floats, booleans	+15	No variable is used on the right side of the statement (after degeri)
F	Correctly parse <mid-statement>s composed of only integers and integer variables	+15	This requires also clearing B
G	Correctly parse <mid-statement>s composed of any operand	+15	This requires also clearing C
X	Correctly parse any file	+15	This requires also clearing G

Late Submission: Allowed with penalty: $-\% 10 * (\text{number_of_days_late})^2$. Example case: You are 2 days late, and you got 90 from evaluation. You will get $90 * (1 - 0.4) = 54$ as your final grade. You will get 0 if you are more than 3 days late.

Example calc.in files (more will be provided)

```
AnaDegiskenler
x degeri 4 olsun
x1 degeri 2 olsun
a degeri    dort olsun
b degeri uc nokta dort olsun
y degeri 8 olsun
z degeri 3.2 olsun
b1 degeri dogru olsun
b2 degeri yanlis olsun
```

```
YeniDegiskenler
```

t1 degeri $x + (y) - z$ olsun
t4 degeri x arti ac-parantez y kapa-parantez eksi z olsun
t2 degeri $(t4 + \text{ac-parantez}((y)) - z)$ kapa-parantez olsun
t3 degeri $b1$ ve $b1$ ve $(b2 \text{ veya } b1)$ olsun

Sonuc

x arti ac-parantez y kapa-parantez eksi z

AnaDegiskenler

YeniDegiskenler

Sonuc