CSE439s: Design of Compilers

Parser and Scanner for Tiny Language

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To Check the functionality of Scanner and LL(1) Parser I have made 5 codes

- **2 Codes are correct**
  - The first one extract prime number from 1 to 100
  - The second one reads n from the user and extracts all odd numbers from 1 to n and sums them
- **3 Codes are wrong**
  - 1. Replace equal operator with assign operator
  - 2. Add a semicolon in the last line which causes an error
  - 3. Delete necessary semicolon

The project has 3 folders and 5 files

1. **Correct_Codes**

   This folder contain the two correct codes

```
{ SUM of odd number Tiny Code}

{Start code} read n;
x := 1;
sum := 0;
repeat
y := x / 2;
if (x - ((y / 2) * 2)) = 1 then
sum := sum + x
end;
x := x + 1
until x < n + 1;
write sum {End Code}
```

```
{Primes number from 1 to 100}
x := 2;
repeat
isPrime := 1;
y := 2;
repeat
if y * y < x then
if x - (x / y) * y = 0 then
isPrime := 0
end
end;
y := y + 1
until y * y < x;
if isPrime = 1 then
write x
end;
x := x + 1
until x < 100
```

2. Wrong_Codes

```
{ Wrong Tiny Code (1) }
{Start code}
fact := 1;
x := 5;
repeat
fact := fact * x;
x := x - 1
until x = 0;

if x := 0 then {Wrong in Assign operator}
fact := 1;
end
write fact {End Code}
```

```
{ Wrong Tiny Code (3) }
{Start code}
fact := 1 {Missing Semicolon}
x := 5;

if x = 0 then {Wrong in Assign operator}
fact := 1;
end
write fact {End Code}
```

```
{ Wrong Tiny Code (2) }
{Start code}
fact := 1;
x := 5;
write fact; {Wrong in Semicolon}
{End Code}
```

3. List_of_Tokens

The scanner generates List_of_Tokens.txt file for each code

Code Files:

1. grammer.py (Independent file)

    Contain all grammar rules for tiny language and first and following for each terminal rule

2. Tokens.py (Independent file)

    Contain all tokens list

3. Scanner.py (depending on the Tokens.py file)

    Contain the Scanner class

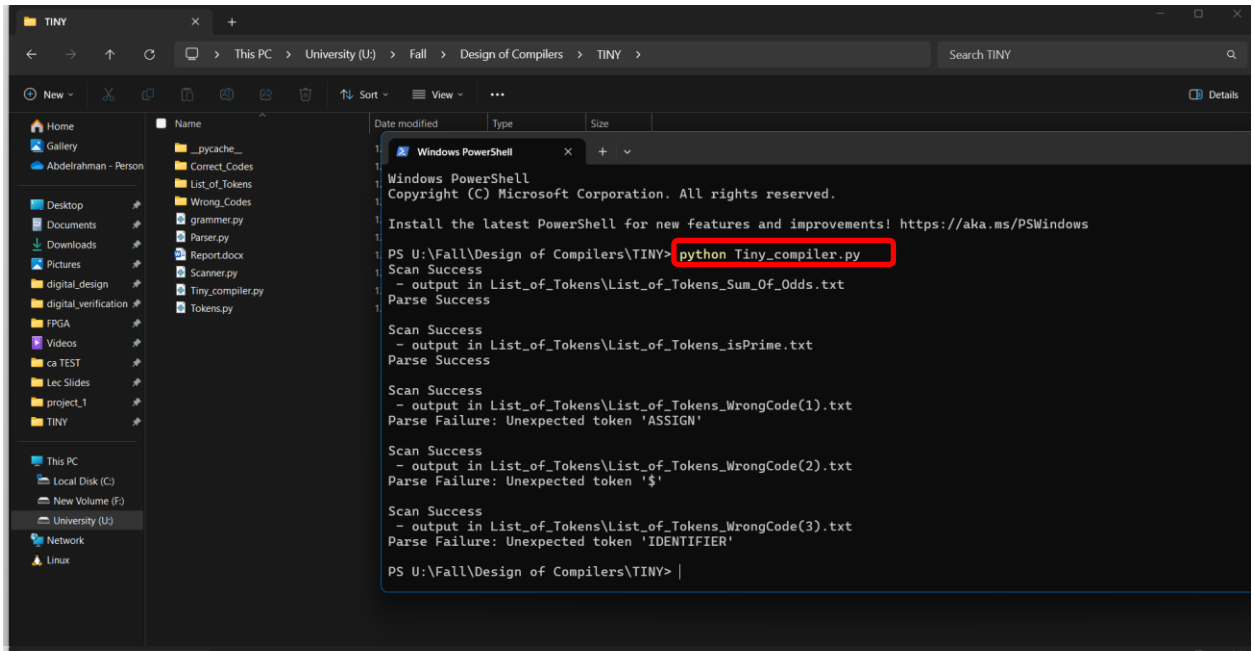
4. Parser.py (depending on grammar.py file)

    Contain the Parser class

5. Tiny_compiler.py

    Main code that wraps all previous codes

Result:


TINY
This PC > University (U:) > Fall > Design of Compilers > TINY >
Search TINY
New
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Details
Home
Gallery
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Desktop
Documents
Downloads
Pictures
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FPGA
Videos
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project_1
TINY
This PC
Local Disk (C:)
New Volume (F:)
University (U:)
Network
Linux
Name
Date modified
Type
Size
__pycache__
Correct_Codes
List_of_Tokens
Wrong_Codes
grammer.py
Parser.py
Report.docx
Scanner.py
Tiny_compiler.py
Tokens.py
Windows PowerShell
Windows PowerShell
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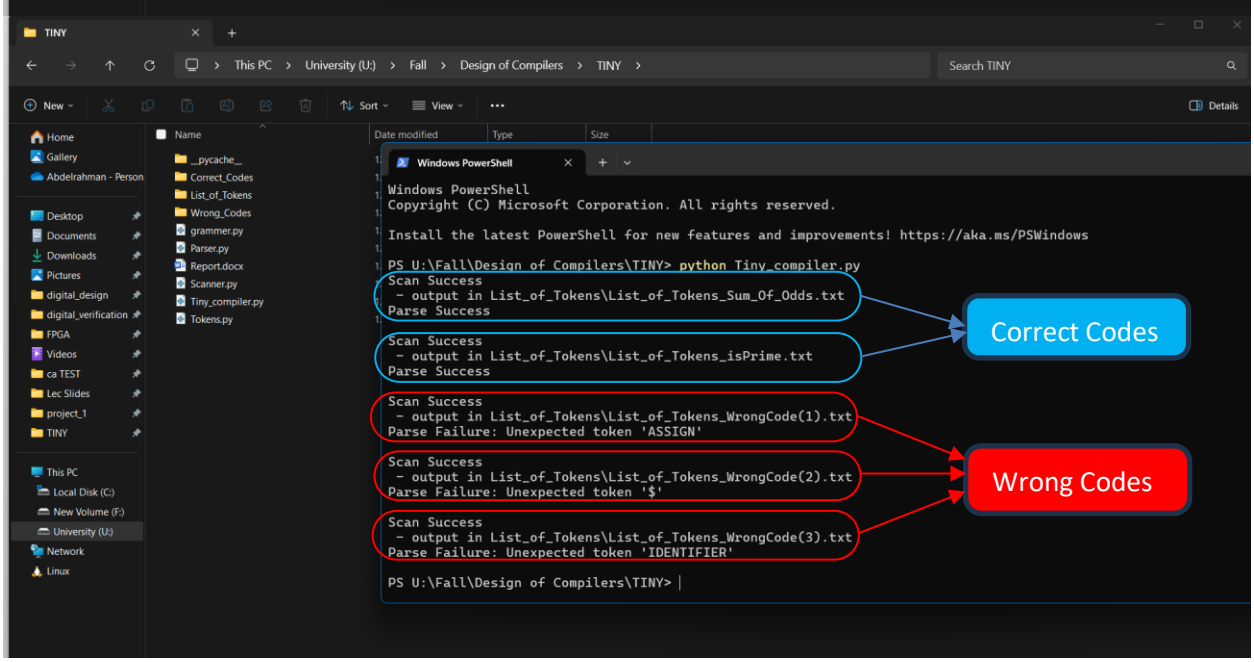
Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows
PS U:\Fall\Design of Compilers\TINY> python Tiny_compiler.py
Scan Success
- output in List_of_Tokens\List_of_Tokens_Sum_Of_Odds.txt
Parse Success
Scan Success
- output in List_of_Tokens\List_of_Tokens_isPrime.txt
Parse Success
Scan Success
- output in List_of_Tokens\List_of_Tokens_WrongCode(1).txt
Parse Failure: Unexpected token 'ASSIGN'
Scan Success
- output in List_of_Tokens\List_of_Tokens_WrongCode(2).txt
Parse Failure: Unexpected token '$'
Scan Success
- output in List_of_Tokens\List_of_Tokens_WrongCode(3).txt
Parse Failure: Unexpected token 'IDENTIFIER'
PS U:\Fall\Design of Compilers\TINY>


TINY
This PC > University (U:) > Fall > Design of Compilers > TINY >
Search TINY
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Sort
View
Details
Windows PowerShell
Windows PowerShell
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Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows
PS U:\Fall\Design of Compilers\TINY> python Tiny_compiler.py
Scan Success
- output in List_of_Tokens\List_of_Tokens_Sum_Of_Odds.txt
Parse Success
Scan Success
- output in List_of_Tokens\List_of_Tokens_isPrime.txt
Parse Success
Scan Success
- output in List_of_Tokens\List_of_Tokens_WrongCode(1).txt
Parse Failure: Unexpected token 'ASSIGN'
Scan Success
- output in List_of_Tokens\List_of_Tokens_WrongCode(2).txt
Parse Failure: Unexpected token '$'
Scan Success
- output in List_of_Tokens\List_of_Tokens_WrongCode(3).txt
Parse Failure: Unexpected token 'IDENTIFIER'
PS U:\Fall\Design of Compilers\TINY>
Correct Codes
Wrong Codes