Mid-Term Test:

1. (10%) Given the grammar below,

```
<assign> -> <id> = <expr>
<id> -> A | B | C
<expr> -> <expr> + <expr> | (<expr>) | <id>
```

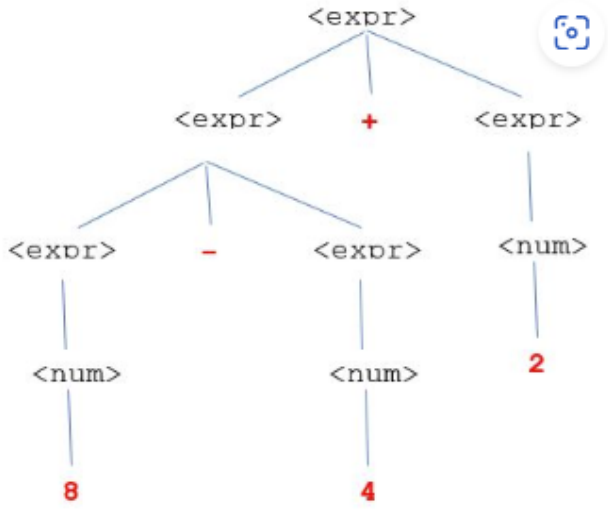
Show step by step of **leftmost deviations** for `A = A + (B + C)`

Next Page

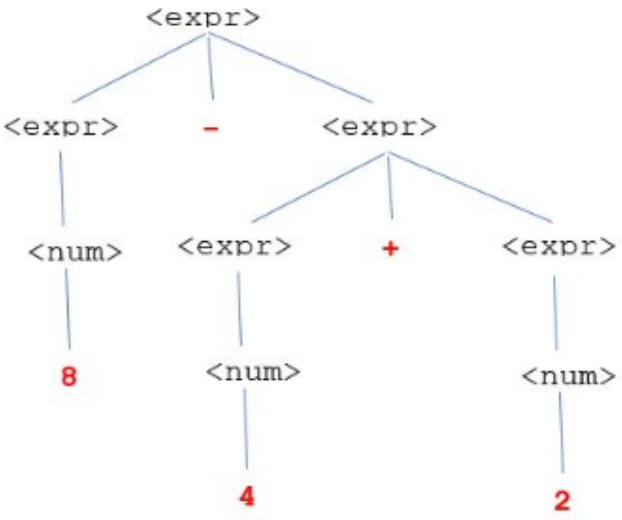
2. Given the grammar below,

```
<expr> -> <expr> + <expr> | <expr> - <expr> | <num>
<num> -> 2 | 4 | 6 | 8
```

a. (5%) What is the computing answer from the **left** parse tree below?
The answer of `8 - 4 + 2` from **left** parse tree below is [ ]



b. (5%) What is the computing answer from the **right** tree below?
The answer of `8 - 4 + 2` from **right** parse tree below is [ ]



c. (5%) Is it an **unambiguous** grammar or **ambiguous** grammar? Why?

[ ]

3. Given the grammar below,

```
<S> -> <A> a <B>
<A> -> <A> a | a
<B> -> 0 | 1 | b
```

Which of the following sentences are in the language generated by this grammar? (If **yes**, show your **deviation**. If **no**, **explain the reason** in English.)

a. (5%) **ab0**

Yes or No? _____
show deviation or explanation:

b. (5%) **aaab**

Yes or No? _____
show deviation or explanation:

c. (5%) Describe, ***in English***, the language defined by the grammar above.

4. (10%) Write a set of grammar for the language consisting of strings that start with one of the letters **a** or **b**, and followed by **n copies** of one of the digits **0** or **1**, where **n > 0**. For example,
the strings **a0**, **a1**, **b0**, **b1**, **a00**, **a111**, **b0000** are in the language,
but **a**, **1**, **0**, **1a**, **aa1**, **bbb2**, **a01**, **a10**, **bbbb01** are **not**.

Next Page

5. Consider the set of the following Pseudo Codes and evaluate the output by two different scope principles, **static scoping** & **dynamic scoping**.

```
var x, y, z;
function funA()
{
    if(x > y)
      return x;
    else
      return y;
}
function funB()
{
  var x, y, temp;
  x = 5;
  y = 10;
  temp = funA();
  return temp;
}
//main program
x = 100;
y = 50;
z = funB();
print(z);
```

a. (5%) Output from the **static scoping** principle:

b. (5%) Output from the **dynamic scoping** principle:

c. (5%) According to the above Pseudo Codes, what is the **lifetime** of variable, **temp**?

d. (5%) If it is followed a **static scoping**, what is **scope** of variable, **temp**?

Next Page

6. Consider the JavaScript program below:

```
var X;
function Sub1(){
   document.write("X = " + X);
}
function Sub2(){
   var X;
   X = 80;
   Sub1();
}
X = 40;
Sub2();
```

a. (5%) Under **static** scoping rules, the output is

b. (5%) Under **dynamic** scoping rules, the output is

Next Page

7. Binary Computation in 6 bits storage:
   Calculate `47-11` by using `two's complement`.

   a. (2%) Convert 47 to a binary number.

   b. (2%) Convert 11 to a binary number.

   c. (2%) Use two's complement concept to find the binary number of `(-11)`.

   d. (2%) Add binary numbers of 47 and `(-11)` together as a sum.

   e. (2%) Convert the binary number of sum into a based ten number (a regular number in our life).

Next Page

8. (5%) Explain **by an example** about what **two problems of pointers** are.

Next Page

9. Pattern Match:

Which of the following Strings **match the pattern** `/^[0-9]?\s[a-z]+\s[A-Z]$/`?

a. (1%) `6 abc MN`
- ○ Match
- ○ NOT Match

b. (1%) `55 xyz U`
- ○ Match
- ○ NOT Match

c. (1%) `6  N`
- ○ Match
- ○ NOT Match

d. (1%) `3 manshort T`
- ○ Match
- ○ NOT Match

e. (1%) `grade A`
- ○ Match
- ○ NOT Match

Submit