

## Assign 6

1.

the grammar above is ambiguous and this line for example is the reason:  $\langle \text{expr} \rangle ::= \langle \text{expr} \rangle ; \langle \text{expr} \rangle$ . and  $\langle \text{expr} \rangle = \text{let } \langle \text{opr} \rangle \text{ in } \langle \text{expr} \rangle$

With a line like  $\langle \text{expr} \rangle ::= \text{let } x \text{ in } y ; z$ , it can be parsed in two ways.

1.  $(\text{let } x \text{ in } y); z$

2.  $\text{let } x \text{ in } (y; z)$

Because of this it is ambiguous

2.

$\langle \text{id} \rangle ::= a | b | c | \dots | z$

$\langle \text{dig} \rangle ::= 0 | 1 | 2 | \dots | 9$

$\langle \text{expr} \rangle ::= \langle \text{simple\_expr} \rangle | \langle \text{let\_expr} \rangle | \langle \text{seq\_expr} \rangle | \langle \text{beg\_expr} \rangle$

$\langle \text{simple\_expr} \rangle ::= ( ) | \langle \text{dig} \rangle | \langle \text{id} \rangle$

$\langle \text{let\_expr} \rangle ::= \text{let } \langle \text{id} \rangle = \langle \text{expr} \rangle \text{ in } \langle \text{expr} \rangle$

$\langle \text{seq\_expr} \rangle ::= \langle \text{expr} \rangle ; \langle \text{expr} \rangle$

$\langle \text{beg\_expr} \rangle ::= \text{begin } \langle \text{expr} \rangle \text{ end}$

3.  $\langle \text{the simple\_expr} \rangle$  - handles the basic cases without Ambiguity such as empty parenthesis, digits, and identifiers

$\langle \text{Let expression} \rangle$ : clearly define the syntax for let expressions, and it remaining ambiguity in the declaration and usage of variables

Sequence\_expr: Introduces a clear structure for sequences, ensuring that expressions are properly separated by semicolons

Begin\_expr: provide a distinct syntax for expression enclosed in 'begin' and 'end', avoiding confusion with constructs. This would make it more clear and less ambiguous