Syntax

Literals	lit	$::= None \mid True \mid False \mid \text{"a"} \mid \ldots \mid 1 \mid \ldots$
Expression	Exp	$::= lit@(\overline{A}) : \tau \mid Exp.id : \tau \mid id_{Fun}(\overline{Exp}) : \tau$
		$\mid Exp.id_{Fun}(\overline{Exp}) : \tau \mid id_{Cls}@(\overline{A}).(\overline{Exp}) : \tau$
	id_{Fun}	$::= f \mid g \mid \ldots$
	id_{Cls}	$::= C \mid D \mid \ldots$
Assign Op.	$AsgOp$	$\in \{\texttt{=, +=, -=, *=, /=, \%=, //=}\}$
Binary Op.	$BinOp$	$\in \{\texttt{||, \&\&, |, \&, ==, !=, <, >, <=, >=, +, -, *, /, \%, **}\}$

Projection To Python

(Exp)
$$(\!|lit@(\overline{B})|\!)^A = \begin{cases} lit & \text{if } A \in \overline{B} \\ \texttt{Unit.id} & \text{otherwise} \end{cases}$$

$$(\!|Exp.id|\!)^A = \begin{cases} (\!|Exp|\!)^A.id & \text{if } A \in \text{rolesOf}(Exp.id) \\ \text{absent} & \text{otherwise} \end{cases}$$

$$(\!|id_{Fun}(\overline{Exp})|\!)^A = \begin{cases} id_{Fun}(\overline{(\!|Exp|\!)^A}) & \text{if } A \in \text{rolesOf}(id_{Fun}(\overline{Exp})) \\ \texttt{Unit.id}_{\texttt{Fun}}(\overline{(\!|Exp|\!)^A}) & \text{otherwise} \end{cases}$$

$$(\!|Exp.id_{Fun}(\overline{Exp})|\!)^A = \begin{cases} (\!|Exp|\!)^A.id_{Fun}(\overline{(\!|Exp|\!)^A}) & \text{if } A \in \text{rolesOf}(Exp) \\ \texttt{Unit.id}_{\texttt{Fun}}((\!|Exp|\!)^A, \overline{(\!|Exp|\!)^A}) & \text{otherwise} \end{cases}$$

$$(\!|id_{Cls}@(\overline{B})(\overline{Exp})|\!)^A = \begin{cases} (\!|id_{Cls}@(\overline{B})|\!)^A(\overline{(\!|Exp|\!)^A}) & A \in \overline{B} \\ \texttt{Unit.id}_{\texttt{Cls}}(\overline{(\!|Exp|\!)^A}) & \text{otherwise} \end{cases}$$

$\text{rolesOf}(lit@(\overline{B}) : \tau@\overline{B}) = \overline{B}$

$\text{rolesOf}(Exp.id : \tau@\overline{B}) = \overline{B}$

$\text{rolesOf}(Exp.id : \tau) = \overline{B}$ if $\text{rolesOf}(Exp) = \overline{B}$

$\text{rolesOf}(id_{Fun}(\overline{Exp}) : \tau@\overline{B}) = \overline{B}$

$\text{rolesOf}(id_{Fun}(\overline{Exp}) : \tau) = \overline{B}$ if $\text{rolesOf}(\overline{Exp}) = \overline{B}$

$\text{rolesOf}(Exp.id_{Fun}(\overline{Exp}) : \tau@\overline{B}) = \overline{B}$

$\text{rolesOf}(Exp.id_{Fun}(\overline{Exp}) : \tau) = \overline{B}$ if $\text{rolesOf}(Exp) = \overline{B}$

$\text{rolesOf}(id_{Cls}@(\overline{B}).(\overline{Exp}) : \tau@\overline{B}) = \overline{B}$