Contents

1 Esercizio 5.1

La grammatica è la medesima dell'esercizio 3.2, trasformata in una grammatica LL(1) equivalente.

1.1 Grammatica LL(1)

⟨*prog*⟩ → ⟨*statlist*⟩ `EOF`

⟨*statlist*⟩ → ⟨*stat*⟩⟨*statlistp*⟩
⟨*statlistp*⟩ → `;` ⟨*stat*⟩⟨*statlistp*⟩
⟨*statlistp*⟩ → ε

⟨*stat*⟩ → `assign` ⟨*assignlist*⟩
⟨*stat*⟩ → `print (` ⟨*exprlist*⟩ `)`
⟨*stat*⟩ → `read (` ⟨*idlist*⟩ `)`
⟨*stat*⟩ → `for (` ⟨*statc*⟩ ⟨*bexpr*⟩ `) do` ⟨*stat*⟩
⟨*stat*⟩ → `if (` ⟨*bexpr*⟩ `)` ⟨*stat*⟩⟨*statp*⟩ `end`
⟨*stat*⟩ → `{` ⟨*statlist*⟩ `}`

⟨*statc*⟩ → `ID :=` ⟨*expr*⟩ `;`
⟨*statc*⟩ → ε

⟨*statp*⟩ → `else` ⟨*stat*⟩
⟨*statp*⟩ → ε

⟨*assignlist*⟩ → `[` ⟨*expr*⟩ `to` ⟨*idlist*⟩ `]` ⟨*assignlistp*⟩
⟨*assignlistp*⟩ → `[` ⟨*expr*⟩ `to` ⟨*idlist*⟩ `]` ⟨*assignlistp*⟩
⟨*assignlistp*⟩ → ε

⟨*idlist*⟩ → `ID` ⟨*idlistp*⟩
⟨*idlistp*⟩ → `,` `ID` ⟨*idlistp*⟩
⟨*idlistp*⟩ → ε

⟨*bexpr*⟩ → `<` ⟨*expr*⟩⟨*expr*⟩
⟨*bexpr*⟩ → `>` ⟨*expr*⟩⟨*expr*⟩
⟨*bexpr*⟩ → `<=` ⟨*expr*⟩⟨*expr*⟩
⟨*bexpr*⟩ → `<=` ⟨*expr*⟩⟨*expr*⟩
⟨*bexpr*⟩ → `==` ⟨*expr*⟩⟨*expr*⟩
⟨*bexpr*⟩ → `<>` ⟨*expr*⟩⟨*expr*⟩

⟨*expr*⟩ → `+ (` ⟨*exprlist*⟩ `)`
⟨*expr*⟩ → `-` ⟨*expr*⟩⟨*expr*⟩
⟨*expr*⟩ → `* (` ⟨*exprlist*⟩ `)`
⟨*expr*⟩ → `/` ⟨*expr*⟩⟨*expr*⟩
⟨*expr*⟩ → `NUM`
⟨*expr*⟩ → `ID`

⟨*exprlist*⟩ → ⟨*expr*⟩⟨*exprlistp*⟩
⟨*exprlistp*⟩ → `,` ⟨*expr*⟩⟨*exprlistp*⟩
⟨*exprlistp*⟩ → ε

1.2 Calcolo di NULL, FIRST e FOLLOW

	NULL	FIRST	FOLLOW
⟨prog⟩		{ `assign`, `print`, `read`, `for`, `if`, `{` }	{ `$` }
⟨statlist⟩		{ `assign`, `print`, `read`, `for`, `if`, `{` }	{ `EOF`, `}` }
⟨statlistp⟩	x	{ `;` }	{ `EOF`, `}` }
⟨stat⟩		{ `assign`, `print`, `read`, `for`, `if`, `{` }	{ `;`, `else`, `end`, `EOF`, `}` }
⟨statc⟩	x	{ `ID` }	{ `<`, `>`, `<=`, `>=`, `==`, `<>` }
⟨statp⟩	x	{ `else` }	{ `end` }
⟨assignlist⟩		{ `[` }	{ `;`, `else`, `end`, `EOF`, `}` }
⟨assignlistp⟩	x	{ `[` }	{ `;`, `else`, `end`, `EOF`, `}` }
⟨idlist⟩		{ `ID` }	{ `)`, `]` }
⟨idlistp⟩	x	{ `,` }	{ `)`, `]` }
⟨bexpr⟩		{ `<`, `>`, `<=`, `>=`, `==`, `<>` }	{ `)` }
⟨expr⟩		{ `+`, `-`, `*`, `/`, `NUM`, `ID` }	{ `,`, `;`, `to`, `+`, `-`, `*`, `/`, `)`, `NUM`, `ID` }
⟨exprlist⟩		{ `+`, `-`, `*`, `/`, `NUM`, `ID` }	{ `)` }
⟨exprlistp⟩	x	{ `,` }	{ `)` }

1.3 Calcolo degli insiemi GUIDA

GUIDA(⟨*prog*⟩ → ⟨*statlist*⟩ `EOF`)	{ `assign`, `print`, `read`, `for`, `if`, `{` }
GUIDA(⟨*statlist*⟩ → ⟨*stat*⟩⟨*statlistp*⟩)	{ `assign`, `print`, `read`, `for`, `if`, `{` }
GUIDA(⟨*statlistp*⟩ → `;` ⟨*stat*⟩⟨*statlistp*⟩)	{ `;` }
GUIDA(⟨*statlistp*⟩ → ε)	{ `EOF`, `}` }
GUIDA(⟨*stat*⟩ → `assign` ⟨*assignlist*⟩)	{ `assign` }
GUIDA(⟨*stat*⟩ → `print (` ⟨*exprlist*⟩ `)`)	{ `print` }
GUIDA(⟨*stat*⟩ → `read (` ⟨*idlist*⟩ `)`)	{ `read` }
GUIDA(⟨*stat*⟩ → `for (` ⟨*statc*⟩ ⟨*bexpr*⟩ `) do` ⟨*stat*⟩)	{ `for` }
GUIDA(⟨*stat*⟩ → `if (` ⟨*bexpr*⟩ `)` ⟨*stat*⟩⟨*statp*⟩ `end`)	{ `if` }
GUIDA(⟨*stat*⟩ → `{` ⟨*statlist*⟩ `}`)	{ `{` }
GUIDA(⟨*statc*⟩ → `ID :=` ⟨*expr*⟩ `;`)	{ `ID` }
GUIDA(⟨*statc*⟩ → ε	{ `<`, `>`, `<=`, `>=`, `==`, `<>` }
GUIDA(⟨*statp*⟩ → `else` ⟨*stat*⟩)	{ `else` }
GUIDA(⟨*statp*⟩ → ε)	{ `end` }
GUIDA(⟨*assignlist*⟩ → `[` ⟨*expr*⟩ `to` ⟨*idlist*⟩ `]` ⟨*assignlistp*⟩)	{ `[` }
GUIDA(⟨*assignlistp*⟩ → `[` ⟨*expr*⟩ `to` ⟨*idlist*⟩ `]` ⟨*assignlistp*⟩)	{ `[` }
GUIDA(⟨*assignlistp*⟩ → ε)	{ `;`, `else`, `end`, `EOF`, `}` }
GUIDA(⟨*idlist*⟩ → `ID` ⟨*idlistp*⟩)	{ `ID` }
GUIDA(⟨*idlistp*⟩ → `,` `ID` ⟨*idlistp*⟩)	{ `,` }
GUIDA(⟨*idlistp*⟩ → ε)	{ `)`, `]` }
GUIDA(⟨*bexpr*⟩ → `<` ⟨*expr*⟩⟨*expr*⟩)	{ `<` }
GUIDA(⟨*bexpr*⟩ → `>` ⟨*expr*⟩⟨*expr*⟩)	{ `>` }
GUIDA(⟨*bexpr*⟩ → `<=` ⟨*expr*⟩⟨*expr*⟩)	{ `<=` }
GUIDA(⟨*bexpr*⟩ → `<=` ⟨*expr*⟩⟨*expr*⟩)	{ `<=` }
GUIDA(⟨*bexpr*⟩ → `==` ⟨*expr*⟩⟨*expr*⟩)	{ `==` }
GUIDA(⟨*bexpr*⟩ → `<>` ⟨*expr*⟩⟨*expr*⟩)	{ `<>` }
GUIDA(⟨*expr*⟩ → `+ (` ⟨*exprlist*⟩ `)`)	{ `+` }
GUIDA(⟨*expr*⟩ → `-` ⟨*expr*⟩⟨*expr*⟩)	{ `-` }

GUIDA($\langle expr \rangle \rightarrow$ `*` `(` $\langle exprlist \rangle$ `)`)	{ `*` }
GUIDA($\langle expr \rangle \rightarrow$ `/` $\langle expr \rangle \langle expr \rangle$)	{ `/` }
GUIDA($\langle expr \rangle \rightarrow$ `NUM`)	{ `NUM` }
GUIDA($\langle expr \rangle \rightarrow$ `ID`)	{ `ID` }
GUIDA($\langle exprlist \rangle \rightarrow \langle expr \rangle \langle exprlistp \rangle$)	{ `+`, `-`, `*`, `/`, `NUM`, `ID` }
GUIDA($\langle exprlistp \rangle \rightarrow$ `,` $\langle expr \rangle \langle exprlistp \rangle$)	{ `,` }
GUIDA($\langle exprlistp \rangle \rightarrow \varepsilon$)	{ `)` }