

Examen 1 - CI4721:

Pregunta 1:

Gramática expandida:

$$\begin{aligned} S &\rightarrow I \$ \\ I &\rightarrow \text{try } I \text{ catch } I \text{ finally } I \\ &\quad | \text{ try } I \text{ catch } I \\ &\quad | I ; I \\ &\quad | \text{ instr} \end{aligned}$$

LR(1)

I0: Start

$S \rightarrow . I \$,$	$\{\$, \}$
$I \rightarrow . \text{ try } I \text{ catch } I \text{ finally } I,$	$\{\$, ;\}$
$ \quad . \text{ try } I \text{ catch } I,$	$\{\$, ;\}$
$ \quad . I ; I,$	$\{\$, ;\}$
$ \quad . \text{ instr},$	$\{\$, ;\}$

I1: leer instr (desde I0, I33, I35):

$I \rightarrow \text{ instr} . ,$	$\{\$, ;\}$
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I2: leer try (desde I0, I35, I33):

$I \rightarrow \text{ try} . I \text{ catch } I \text{ finally } I,$	$\{\$, ;\}$
$ \quad \text{ try} . I \text{ catch } I,$	$\{\$, ;\}$

$I \rightarrow . \text{ try } I \text{ catch } I \text{ finally } I,$	$\{\text{catch}, ;\}$
$ \quad . \text{ try } I \text{ catch } I,$	$\{\text{catch}, ;\}$
$ \quad . I ; I,$	$\{\text{catch}, ;\}$
$ \quad . \text{ instr},$	$\{\text{catch}, ;\}$

I3: leer try (desde I2, I3, I5, I9, I19, I26):

$I \rightarrow \text{ try} . I \text{ catch } I \text{ finally } I,$	$\{\text{catch}, ;\}$
$ \quad \text{ try} . I \text{ catch } I,$	$\{\text{catch}, ;\}$

$I \rightarrow . \text{ try } I \text{ catch } I \text{ finally } I,$	$\{\text{catch}, ;\}$
$ \quad . \text{ try } I \text{ catch } I,$	$\{\text{catch}, ;\}$

	. I ; I,	{catch, ;}
	. <i>instr</i> ;	{catch, ;}

I4: leer I (desde I3):

I →	<i>try</i> I . <i>catch</i> I <i>finally</i> I,	{catch, ;}
	<i>try</i> I . <i>catch</i> I,	{catch, ;}
	I . ; I,	{catch, ;}

I5: leer ; (desde, I4, I6, I10, I20, I21, I27):

I →	I ; . I,	{catch, ;}
I →	. <i>try</i> I <i>catch</i> I <i>finally</i> I,	{catch, ;}
	. <i>try</i> I <i>catch</i> I,	{catch, ;}
	. I ; I,	{catch, ;}
	. <i>instr</i> ;	{catch, ;}

I6: leer I (desde I5): SHIFT/REDUCE

I →	I ; I .,	{catch, ;}
	I . ; I,	{catch, ;}

I7: leer *instr* (desde I5, I9, I2, I3, I19, I26):

I →	<i>instr</i> .,	{catch, ;}
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I8: leer *catch* (desde I4):

I →	<i>try</i> I <i>catch</i> . I <i>finally</i> I,	{catch, ;}
	<i>try</i> I <i>catch</i> . I,	{catch, ;}

I →	. <i>try</i> I <i>catch</i> I <i>finally</i> I,	{finally, catch, ;}
	. <i>try</i> I <i>catch</i> I,	{finally, catch, ;}
	. I ; I,	{finally, catch, ;}
	. <i>instr</i> ;	{finally, catch, ;}

I9: leer *try* (desde I8, I11, I14, I16):

I →	<i>try</i> . I <i>catch</i> I <i>finally</i> I,	{finally, catch, ;}
	<i>try</i> . I <i>catch</i> I,	{finally, catch, ;}

I →	. <i>try</i> I <i>catch</i> I <i>finally</i> I,	{catch, ;}
	. <i>try</i> I <i>catch</i> I,	{catch, ;}
	. I ; I,	{catch, ;}

	<i>. instr;</i>	{catch, ;}
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I10: leer I (desde I9):

I →	<i>try I . catch I finally I,</i>	{finally, catch, ;}
	<i>try I . catch I,</i>	{finally, catch, ;}
	<i>I . ; I,</i>	{catch, ;}

I11: leer catch (desde I10):

I →	<i>try I catch . I finally I,</i>	{finally, catch, ;}
	<i>try I catch . I,</i>	{finally, catch, ;}

I →	<i>. try I catch I finally I,</i>	{finally, catch, ;}
	<i>. try I catch I,</i>	{finally, catch, ;}
	<i>. I ; I,</i>	{finally, catch, ;}
	<i>. instr;</i>	{finally, catch, ;}

I12: leer instr (desde I11, I14, I16, I8):

I →	<i>instr .,</i>	{finally, catch, ;}
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I13: leer I (desde I11): SHIFT/REDUCE (*2)

I →	<i>try I catch I . finally I,</i>	{finally, catch, ;}
	<i>try I catch I .,</i>	{finally, catch, ;}
	<i>I . ; I,</i>	{finally, catch, ;}

I14: leer ; (desde I13, I15, I17, I18):

I →	<i>I ; . I,</i>	{finally, catch, ;}
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I →	<i>. try I catch I finally I,</i>	{finally, catch, ;}
	<i>. try I catch I,</i>	{finally, catch, ;}
	<i>. I ; I,</i>	{finally, catch, ;}
	<i>. instr;</i>	{finally, catch, ;}

I15: leer I (desde I14): SHIFT/REDUCE

I →	<i>I ; I .,</i>	{finally, catch, ;}
	<i>I . ; I,</i>	{finally, catch, ;}

I16: leer finally (desde I13):

$I \rightarrow \text{try } I \text{ catch } I \text{ finally } . I, \quad \{\text{finally, catch, ;}\}$

$I \rightarrow \begin{array}{l} . \text{ try } I \text{ catch } I \text{ finally } I, \\ | \quad . \text{ try } I \text{ catch } I, \\ | \quad . I ; I, \\ | \quad . \text{ instr}; \end{array} \quad \begin{array}{l} \{\text{finally, catch, ;}\} \\ \{\text{finally, catch, ;}\} \\ \{\text{finally, catch, ;}\} \\ \{\text{finally, catch, ;}\} \end{array}$

I17: leer I (desde I16): SHIFT/REDUCE

$I \rightarrow \begin{array}{l} \text{try } I \text{ catch } I \text{ finally } I ., \\ | \quad I . ; I, \end{array} \quad \begin{array}{l} \{\text{finally, catch, ;}\} \\ \{\text{finally, catch, ;}\} \end{array}$

I18: leer I (desde I8):

$I \rightarrow \begin{array}{l} \text{try } I \text{ catch } I . \text{ finally } I, \\ | \quad \text{try } I \text{ catch } I ., \\ | \quad I . ; I, \end{array} \quad \begin{array}{l} \{\text{catch, ;}\} \\ \{\text{catch, ;}\} \\ \{\text{finally, catch, ;}\} \end{array}$

I19: leer finally (desde I18):

$I \rightarrow \text{try } I \text{ catch } I \text{ finally } . I, \quad \{\text{catch, ;}\}$

$I \rightarrow \begin{array}{l} . \text{ try } I \text{ catch } I \text{ finally } I, \\ | \quad . \text{ try } I \text{ catch } I, \\ | \quad . I ; I, \\ | \quad . \text{ instr}; \end{array} \quad \begin{array}{l} \{\text{catch, ;}\} \\ \{\text{catch, ;}\} \\ \{\text{catch, ;}\} \\ \{\text{catch, ;}\} \end{array}$

I20: leer I (desde I19):

$I \rightarrow \begin{array}{l} \text{try } I \text{ catch } I \text{ finally } I ., \\ | \quad I . ; I, \end{array} \quad \begin{array}{l} \{\text{catch, ;}\} \\ \{\text{catch, ;}\} \end{array}$

I21: leer I (desde I2)

$I \rightarrow \begin{array}{l} \text{try } I . \text{ catch } I \text{ finally } I, \\ | \quad \text{try } I . \text{ catch } I, \\ | \quad I . ; I, \end{array} \quad \begin{array}{l} \{\$, ;\} \\ \{\$, ;\} \\ \{\text{catch, ;}\} \end{array}$

I22: leer catch (desde I21):

$I \rightarrow$	$try\ I\ catch\ .\ I\ finally\ I,$	$\{\$, ;\}$
	$try\ I\ catch\ .\ I,$	$\{\$, ;\}$
$I \rightarrow$	$.\ try\ I\ catch\ I\ finally\ I,$	$\{finally, \$, ;\}$
	$.\ try\ I\ catch\ I,$	$\{finally, \$, ;\}$
	$.\ I ; I,$	$\{finally, \$, ;\}$
	$.\ instr;$	$\{finally, \$, ;\}$

I23: leer instr (desde I22, I25, I30, I28):

$I \rightarrow$	$instr\ .,$	$\{finally, \$, ;\}$
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I24: leer I (desde I22): SHIFT/REDUCE

$I \rightarrow$	$try\ I\ catch\ I\ .\ finally\ I,$	$\{\$, ;\}$
	$try\ I\ catch\ I\ .,$	$\{\$, ;\}$
	$I\ ;\ I,$	$\{finally, \$, ;\}$

I25: leer ; (desde I24, I29, I31, I32):

$I \rightarrow$	$I\ ;\ .\ I,$	$\{finally, \$, ;\}$
$I \rightarrow$	$.\ try\ I\ catch\ I\ finally\ I,$	$\{finally, \$, ;\}$
	$.\ try\ I\ catch\ I,$	$\{finally, \$, ;\}$
	$.\ I\ ;\ I,$	$\{finally, \$, ;\}$
	$.\ instr;$	$\{finally, \$, ;\}$

I26: leer try (desde I22, I25, I28, I30):

$I \rightarrow$	$try\ .\ I\ catch\ I\ finally\ I,$	$\{finally, \$, ;\}$
	$try\ .\ I\ catch\ I,$	$\{finally, \$, ;\}$
$I \rightarrow$	$.\ try\ I\ catch\ I\ finally\ I,$	$\{catch, ;\}$
	$.\ try\ I\ catch\ I,$	$\{catch, ;\}$
	$.\ I\ ;\ I,$	$\{catch, ;\}$
	$.\ instr;$	$\{catch, ;\}$

I27: leer I (desde I26)

$I \rightarrow$	$try\ I.\ catch\ I\ finally\ I,$	$\{finally,\ \$,\ ;\}$
	$try\ I.\ catch\ I,$	$\{finally,\ \$,\ ;\}$
$I \rightarrow$	$I.\ ;\ I,$	$\{catch,\ ;\}$

I28: leer catch (desde I27):

$I \rightarrow$	$try\ I\ catch.\ I\ finally\ I,$	$\{finally,\ \$,\ ;\}$
	$try\ I\ catch.\ I,$	$\{finally,\ \$,\ ;\}$

$I \rightarrow$	$.\ try\ I\ catch\ I\ finally\ I,$	$\{finally,\ \$,\ ;\}$
	$.\ try\ I\ catch\ I,$	$\{finally,\ \$,\ ;\}$
	$.\ I\ ;\ I,$	$\{finally,\ \$,\ ;\}$
	$.\ instr;$	$\{finally,\ \$,\ ;\}$

I29: leer I (desde I28): SHIFT/REDUCE (*2)

$I \rightarrow$	$try\ I\ catch\ I.\ finally\ I,$	$\{finally,\ \$,\ ;\}$
	$try\ I\ catch\ I.\ ,$	$\{finally,\ \$,\ ;\}$

$I \rightarrow$	$I.\ ;\ I,$	$\{finally,\ \$,\ ;\}$
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I30: leer finally (desde I29):

$I \rightarrow$	$try\ I\ catch\ I\ finally.\ I,$	$\{finally,\ \$,\ ;\}$
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$I \rightarrow$	$.\ try\ I\ catch\ I\ finally\ I,$	$\{finally,\ \$,\ ;\}$
	$.\ try\ I\ catch\ I,$	$\{finally,\ \$,\ ;\}$
	$.\ I\ ;\ I,$	$\{finally,\ \$,\ ;\}$
	$.\ instr;$	$\{finally,\ \$,\ ;\}$

I31: leer I (desde I30): SHIFT/REDUCE

$I \rightarrow$	$try\ I\ catch\ I\ finally\ I.\ ,$	$\{finally,\ \$,\ ;\}$
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$I \rightarrow$	$I.\ ;\ I,$	$\{finally,\ \$,\ ;\}$
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I32: leer I (desde I25): SHIFT/REDUCE

$I \rightarrow$	$I\ ;\ I.\ ,$	$\{finally,\ \$,\ ;\}$
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$I \rightarrow$	$I.\ ;\ I,$	$\{finally,\ \$,\ ;\}$
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I33: leer finally (desde I24):

$I \rightarrow \text{try } I \text{ catch } I \text{ finally } . I, \quad \{\$, ;\}$

$I \rightarrow \begin{array}{l} . \text{try } I \text{ catch } I \text{ finally } I, \\ | \quad . \text{try } I \text{ catch } I, \\ | \quad . I ; I, \\ | \quad . \text{instr}; \end{array} \quad \begin{array}{l} \{\$, ;\} \\ \{\$, ;\} \\ \{\$, ;\} \\ \{\$, ;\} \end{array}$

I34: leer I (desde I33): SHIFT/REDUCE

$I \rightarrow \text{try } I \text{ catch } I \text{ finally } I ., \quad \{\$, ;\}$

$I \rightarrow I . ; I, \quad \{\$, ;\}$

I35: leer ; (desde I34, I36, I37):

$I \rightarrow I ; . I, \quad \{\$, ;\}$

$I \rightarrow \begin{array}{l} . \text{try } I \text{ catch } I \text{ finally } I, \\ | \quad . \text{try } I \text{ catch } I, \\ | \quad . I ; I, \\ | \quad . \text{instr}; \end{array} \quad \begin{array}{l} \{\$, ;\} \\ \{\$, ;\} \\ \{\$, ;\} \\ \{\$, ;\} \end{array}$

I36: leer I (desde I35): SHIFT/REDUCE

$I \rightarrow \begin{array}{l} I ; I ., \\ | \quad I . ; I, \end{array} \quad \begin{array}{l} \{\$, ;\} \\ \{\$, ;\} \end{array}$

I37: leer I (desde I0):

$S \rightarrow I . , \quad \{\$\}$

$I \rightarrow I . ; I, \quad \{\$, ;\}$

I38: leer \$ (desde I37):

$S \rightarrow I \$. \quad \{\$\}$

Soluciones para conflictos:

I6 → Reduce

I13 → Shift 1, Shift 2

I15 → Reduce

I17 → Reduce

I18 → Shift

I20 → Reduce

I24 → Shift

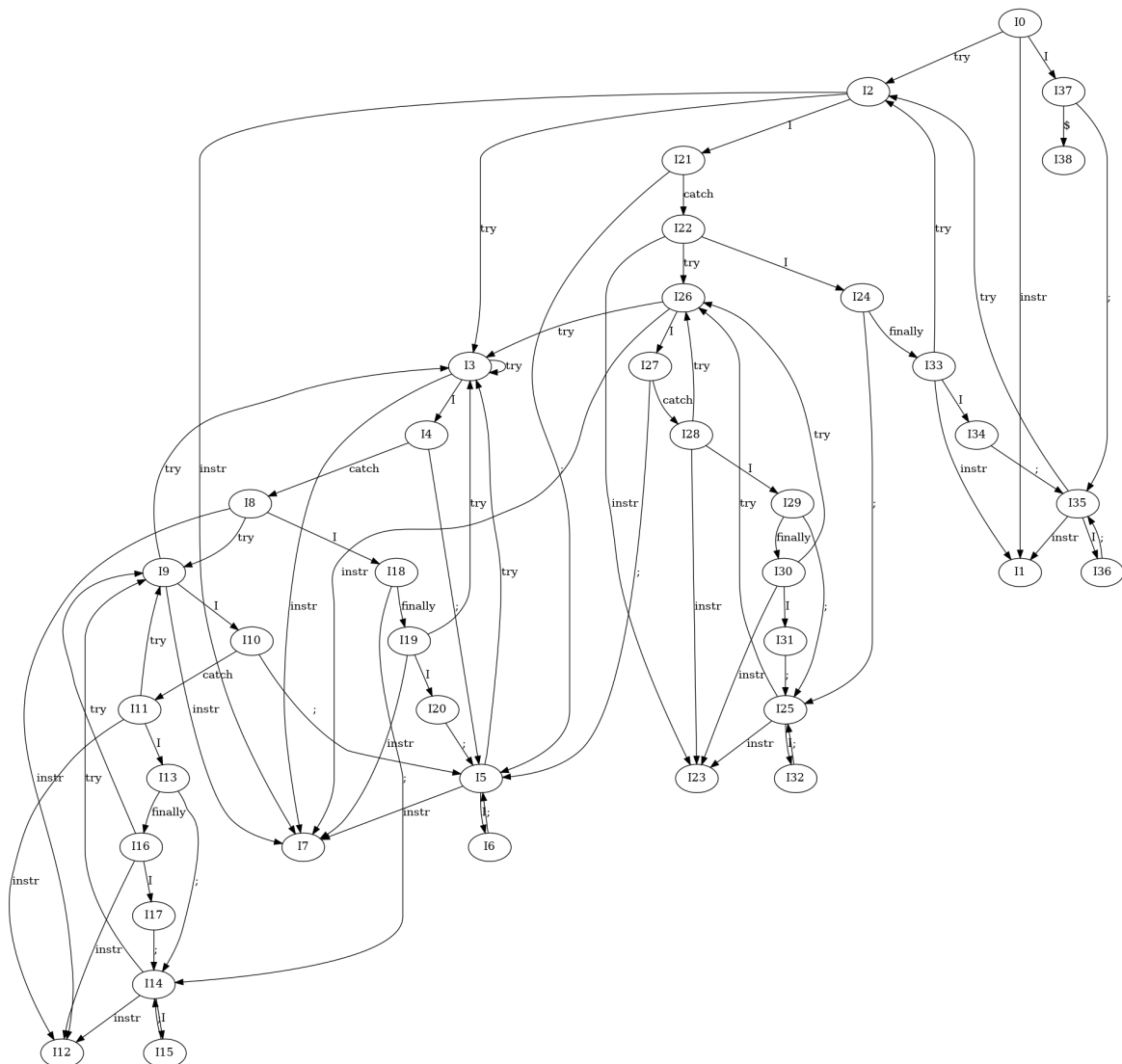
I29 → Shift 1, Shift 2

I31 → Reduce

I32 → Reduce

I34 → Reduce

I36 → Reduce



LALR(1)

I0:

S →	. I ,	{ \$ }
I →	. try I catch I finally I,	{ \$, ; }
	. try I catch I,	{ \$, ; }
	. I ; I,	{ \$, ; }
	. instr;	{ \$, ; }

I9-3: leer try (desde I11-8, I14-5, I16-19, I26-2, I9-3):

I →	try . I catch I finally I,	{ finally, catch, ; }
	try . I catch I,	{ finally, catch, ; }

I →	. try I catch I finally I,	{ catch, ; }
	. try I catch I,	{ catch, ; }
	. I ; I,	{ catch, ; }
	. instr;	{ catch, ; }

I10-4: leer I (desde I9-3):

I →	try I . catch I finally I,	{ finally, catch, ; }
	try I . catch I,	{ finally, catch, ; }
	I . ; I,	{ catch, ; }

I11-8: leer catch (desde I10-4):

I →	try I catch . I finally I,	{ finally, catch, ; }
	try I catch . I,	{ finally, catch, ; }

I →	. try I catch I finally I,	{ finally, catch, ; }
	. try I catch I,	{ finally, catch, ; }
	. I ; I,	{ finally, catch, ; }
	. instr;	{ finally, catch, ; }

I12-7: leer instr (desde I11-8, I14-5, I16-19, I9-3, I26-2):

I →	instr .,	{ finally, catch, ; }
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I13-18: leer I (desde I11-8): SHIFT/REDUCE (*2)

I →	try I catch I . finally I,	{ finally, catch, ; }
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	<i>try</i> I <i>catch</i> I .,	{finally, catch, ;}
	I . ; I,	{finally, catch, ;}

I14-5: leer ; (desde I13-18, I15-6, I17-20, I10-4, I27-21):

I →	I ; . I,	{finally, catch, ;}
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I →	. <i>try</i> I <i>catch</i> I <i>finally</i> I,	{finally, catch, ;}
	. <i>try</i> I <i>catch</i> I,	{finally, catch, ;}
	. I ; I,	{finally, catch, ;}
	. <i>instr</i> ;	{finally, catch, ;}

I15-6: leer I (desde I14-5): SHIFT/REDUCE

I →	I ; I .,	{finally, catch, ;}
	I . ; I,	{finally, catch, ;}

I16-19: leer finally (desde I13-18):

I →	<i>try</i> I <i>catch</i> I <i>finally</i> . I,	{finally, catch, ;}
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I →	. <i>try</i> I <i>catch</i> I <i>finally</i> I,	{finally, catch, ;}
	. <i>try</i> I <i>catch</i> I,	{finally, catch, ;}
	. I ; I,	{finally, catch, ;}
	. <i>instr</i> ;	{finally, catch, ;}

I17-20: leer I (desde I16-19): SHIFT/REDUCE

I →	<i>try</i> I <i>catch</i> I <i>finally</i> I .,	{finally, catch, ;}
	I . ; I,	{finally, catch, ;}

I23-1: leer instr (desde I28-22, I25-35, I30-33, I0):

I →	<i>instr</i> .,	{finally, \$, ;}
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I25-35: leer ; (desde I29-24, I31-34, I32-36, I37):

I →	I ; . I,	{finally, \$, ;}
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I →	. <i>try</i> I <i>catch</i> I <i>finally</i> I,	{finally, \$, ;}
	. <i>try</i> I <i>catch</i> I,	{finally, \$, ;}
	. I ; I,	{finally, \$, ;}
	. <i>instr</i> ;	{finally, \$, ;}

I26-2: leer try (desde I28-22, I25-35, I30-33, I0):

$I \rightarrow$	$try . I catch I finally I,$	$\{finally, \$, ;\}$
	$try . I catch I,$	$\{finally, \$, ;\}$

$I \rightarrow$	$. try I catch I finally I,$	$\{catch, ;\}$
	$. try I catch I,$	$\{catch, ;\}$
	$. I ; I,$	$\{catch, ;\}$
	$. instr;$	$\{catch, ;\}$

I27-21: leer I (desde I26-2):

$I \rightarrow$	$try I . catch I finally I,$	$\{finally, \$, ;\}$
	$try I . catch I,$	$\{finally, \$, ;\}$
$I \rightarrow$	$I . ; I,$	$\{catch, ;\}$

I28-22: leer catch (desde I27-21):

$I \rightarrow$	$try I catch . I finally I,$	$\{finally, \$, ;\}$
	$try I catch . I,$	$\{finally, \$, ;\}$

$I \rightarrow$	$. try I catch I finally I,$	$\{finally, \$, ;\}$
	$. try I catch I,$	$\{finally, \$, ;\}$
	$. I ; I,$	$\{finally, \$, ;\}$
	$. instr;$	$\{finally, \$, ;\}$

I29-24: leer I (desde I28-22): SHIFT/REDUCE (*2)

$I \rightarrow$	$try I catch I . finally I,$	$\{finally, \$, ;\}$
	$try I catch I .,$	$\{finally, \$, ;\}$

$I \rightarrow$	$I . ; I,$	$\{finally, \$, ;\}$
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I30-33: leer finally (desde I29-24):

$I \rightarrow$	$try I catch I finally . I,$	$\{finally, \$, ;\}$
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$I \rightarrow$	$. try I catch I finally I,$	$\{finally, \$, ;\}$
	$. try I catch I,$	$\{finally, \$, ;\}$
	$. I ; I,$	$\{finally, \$, ;\}$
	$. instr;$	$\{finally, \$, ;\}$

I31-34: leer I (desde I30-33): SHIFT/REDUCE
I → try I catch I finally I ., {finally, \$, ;}

I → I . ; I, {finally, \$, ;}

I32-36: leer I (desde I25-35): SHIFT/REDUCE
I → I ; I ., {finally, \$, ;}

I → I . ; I, {finally, \$, ;}

I37: leer I (desde I0):
S → I . , {\$}
I → I . ; I, {\$, ;}

I38: leer \$ (desde I37):
S → I \$. {\$}

Solución para conflictos:

I13-18 → Shift 1, Shift 2

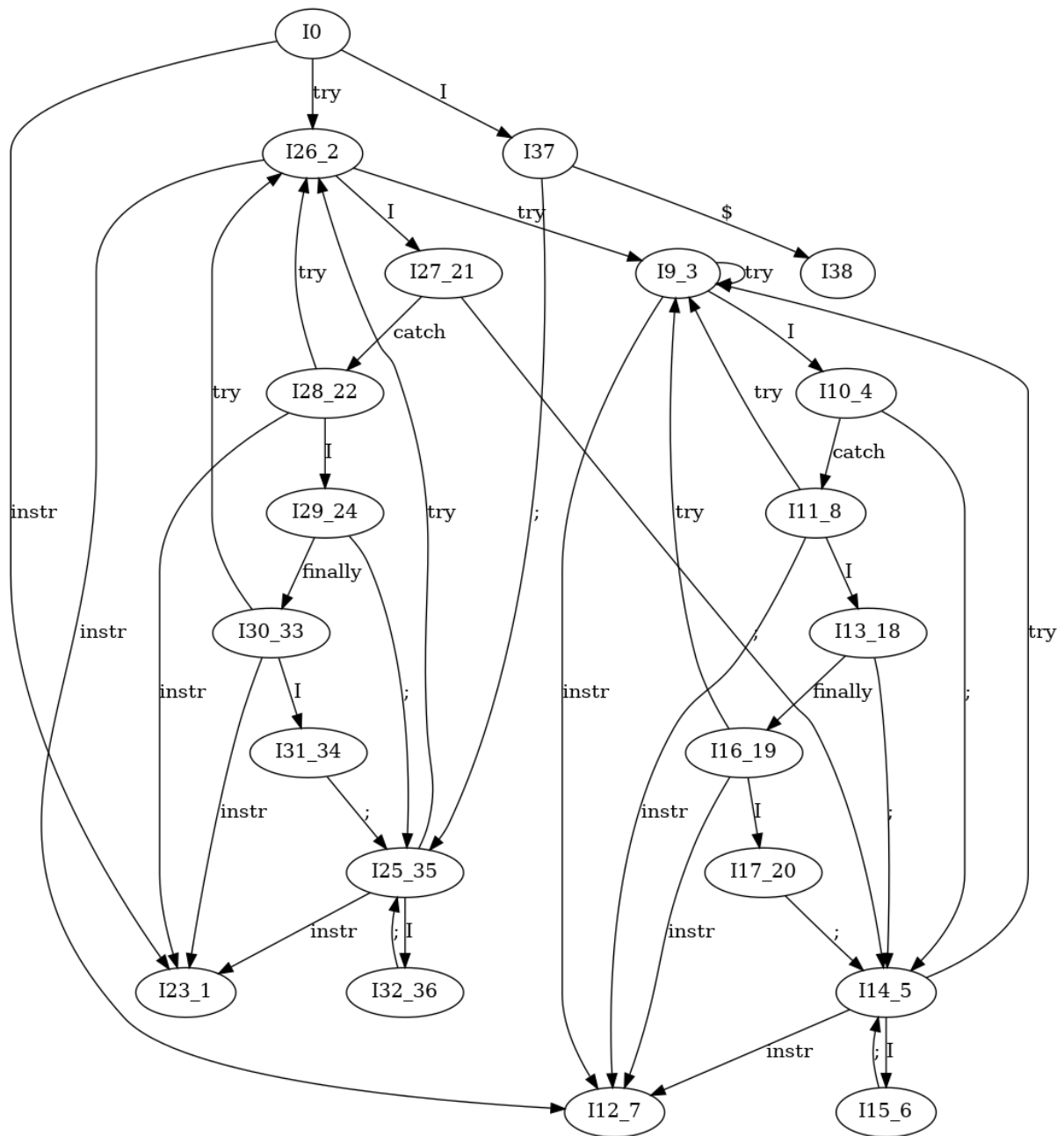
I15-6 → Reduce

I17-20 → Reduce

I29-24 → Shift 1, Shift 2

I31-34 → Reduce

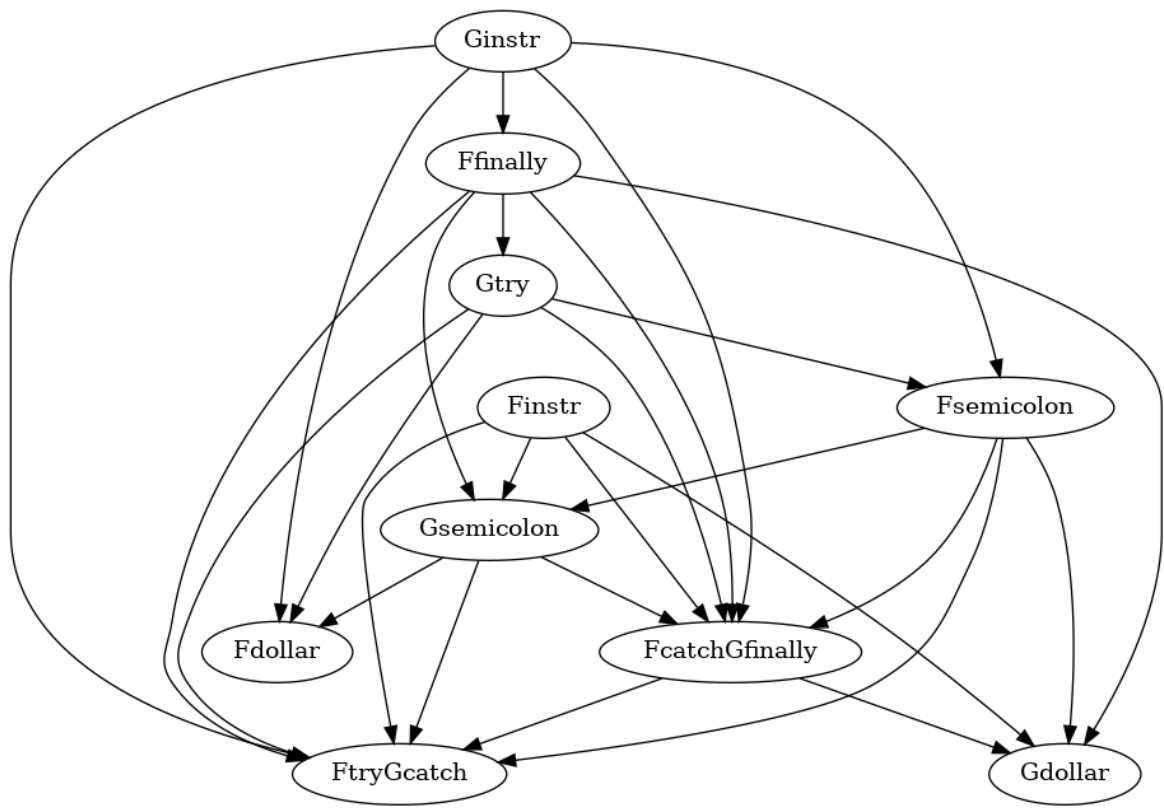
I32-36 → Reduce



Pregunta 2:

Relación de precedencia de operadores:

	try	catch	finally	;	instr	\$
try	<	≡		<	<	
catch	<	>	≡	<	<	>
finally	>	>	>	>	<	>
;	<	>	>	>	<	>
instr		>	>	>		>
\$	<			<	<	



	try	catch	finally	;	instr	\$
f	0	1	3	3	3	0

g	4	0	1	2	4	0
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Forma sentencial	Acción
\$ <instr> ; <try <instr> catch <instr> ; <try <instr> catch <instr> finally <instr> ; <instr> \$	Ubicar, Reducir: $I \rightarrow instr$ Reemplazar
\$ < ; < try <instr> catch <instr> ; > try < instr > catch < instr > finally <instr> ; <instr> \$	Ubicar, Reducir: $I \rightarrow instr$, Reemplazar
\$ < ; < try \doteq catch <instr> ; > try < instr > catch < instr > finally <instr> ; <instr> \$	Ubicar, Reducir: $I \rightarrow instr$, Reemplazar
\$ < ; < try \doteq catch < ; > try < instr > catch < instr > finally <instr> ; <instr> \$	Ubicar, Reducir: $I \rightarrow I ; I$, Reemplazar
\$ < ; < try \doteq catch < try < instr > catch < instr > finally <instr> ; <instr> \$	ubicar, Reducir: $I \rightarrow instr$, Reemplazar
\$ < ; < try \doteq catch < try \doteq catch < instr > finally <instr> ; <instr> \$	Ubicar, Reducir: $I \rightarrow instr$, Reemplazar
\$ < ; < try \doteq catch < try \doteq catch \doteq finally <instr> ; <instr> \$	Ubicar, Reducir: $I \rightarrow instr$, Reemplazar
\$ < ; < try \doteq catch < try \doteq catch \doteq finally > ; <instr> \$	ubicar, Reducir: $I \rightarrow try I catch I finally I$, Reemplazar
\$ < ; < try \doteq catch < ; <instr> \$	Ubicar, Reducir: $I \rightarrow instr$, Reemplazar

$\$ \langle ; \langle \text{try} \doteq \text{catch} \langle ; \rangle \$$	Ubicar, Reducir: $I \rightarrow I ; I$, Reemplazar
$\$ \langle ; \langle \textbf{try} \doteq \textbf{catch} \rangle \$$	Ubicar, Reducir: $I \rightarrow \text{try } I \text{ catch } I$, Reemplazar
$\$ \langle ; \rangle \$$	Ubicar, Reducir $I \rightarrow I ; I$, Aceptar