Examen 2

CI3641 – Lenguajes de Programación I
Enero–Marzo 2022
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Carnet: 16-11313

Constantes:
X = 3
Y = 1
Z = 3

Enlace de github donde se encontrarán los programas:
https://github.com/mvgregoryj/CI3641-Lenguajes-de-Programacion-I/tree/main/Examen%202

Respuesta 2:
En el repositorio

Respuesta 3.a:

Imprime:

```
1   def ins(e, ls):
2       yield [e, *ls]
3       if ls:
4           for i in ins(e, ls[1:]):
5               yield [ls[0], *i]
6
7   for i in ins(0, [1, 2, 3]):
8       print (i)
```

GLOBAL	
ins	proc
i	-
pc	7

Imprime:

```
1    def ins(e, ls):
2        yield [e, *ls]
3        if ls:
4            for i in ins(e, ls[1:]):
5                yield [ls[0], *i]
6
7    for i in ins(0, [1, 2, 3]):
8        print (i)
```

GLOBAL	
ins	proc
i	-
pc	7

ins				
	2	ls	[1, 2, 3]
	1	e	0
	0	pc	2

Imprime:
[0,1,2,3]

```
1    def ins(e, ls):
2        yield [e, *ls]
3        if ls:
4            for i in ins(e, ls[1:]):
5                yield [ls[0], *i]
6
7    for i in ins(0, [1, 2, 3]):
8        print (i)
```

GLOBAL	
ins	proc
i	[0,1,2,3]
pc	~~7~~ 8

		2	ls	[1, 2, 3]
ins		1	e	0
		0	pc	2

Imprime:
[0,1,2,3]

```
1    def ins(e, ls):
2        yield [e, *ls]
3        if ls:
4            for i in ins(e, ls[1:]):
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6
7    for i in ins(0, [1, 2, 3]):
8        print (i)
```

GLOBAL	
ins	proc
i	[0,1,2,3]
pc	~~7~~ ~~8~~ 7

	2	ls	[1, 2, 3]	
ins	1	e	0	
	0	pc	2	

Imprime:
[0,1,2,3]

```
1    def ins(e, ls):
2        yield [e, *ls]
3        if ls:
4            for i in ins(e, ls[1:]):
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6
7    for i in ins(0, [1, 2, 3]):
8        print (i)
```

GLOBAL	
ins	proc
i	[0,1,2,3]
pc	~~7~~ ~~8~~ 7

ins	2	ls	[1, 2, 3]
	1	e	0
	0	pc	~~2~~ 3

Imprime:
[0,1,2,3]

```
1    def ins(e, ls):
2        yield [e, *ls]
3        if ls:
4            for i in ins(e, ls[1:]):
5                yield [ls[0], *i]
6
7    for i in ins(0, [1, 2, 3]):
8        print (i)
```

GLOBAL	
ins	proc
i	[0,1,2,3]
pc	~~7~~ ~~8~~ 7

ins	3	i	-
	2	ls	[1, 2, 3]
	1	e	0
	0	pc	~~2~~ ~~3~~ 4

Imprime:
[0,1,2,3]

```
1    def ins(e, ls):
2    ·····yield [e, *ls]
3        if ls:
4            for i in ins(e, ls[1:]):
5                yield [ls[0], *i]
6
7    for i in ins(0, [1, 2, 3]):
8        print (i)
```

GLOBAL	
ins	proc
i	[0,1,2,3]
pc	~~7~~ ~~8~~ 7

ins			
	6	ls	[2, 3]
	5	e	0
	4	pc	2

ins			
	3	i	-
	2	ls	[1, 2, 3]
	1	e	0
	0	pc	~~2~~ ~~3~~ 4

Imprime:
[0,1,2,3]

```
1    def ins(e, ls):
2        yield [e, *ls]
3        if ls:
4            for i in ins(e, ls[1:]):
5                yield [ls[0], *i]
6
7    for i in ins(0, [1, 2, 3]):
8        print (i)
```

		6	ls	[2,3]
ins		5	e	0
		4	pc	2

		3	i	[0,2,3]
ins		2	ls	[1,2,3]
		1	e	0
		0	pc	2 3 4 5

GLOBAL	
ins	proc
i	[0,1,2,3]
pc	7 8 7

Imprime:
[0,1,2,3]
[1,0,2,3]

```
1   def ins(e, ls):
2       yield [e, *ls]
3       if ls:
4           for i in ins(e, ls[1:]):
5               yield [ls[0], *i]
6
7   for i in ins(0, [1, 2, 3]):
8       print(i)
```

GLOBAL	
ins	proc
i	[0,1,2,3] [1,0,2,3]
pc	7 8 7 8

ins	6	ls	[2,3]
	5	e	0
	4	pc	2

ins	3	i	[0,2,3]
	2	ls	[1,2,3]
	1	e	0
	0	pc	2 3 4 5

Imprime:
[0,1,2,3]
[1,0,2,3]

```
1  def ins(e, ls):
2      yield [e, *ls]
3      if ls:
4          for i in ins(e, ls[1:]):
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6
7  for i in ins(0, [1, 2, 3]):
8      print (i)
```

			ls	[2,3]
ins		6		
		5	e	0
		4	pc	2

GLOBAL	
ins	proc
i	[0,1,2,3] [1,0,2,3]
pc	7 8 7 8 7

			i	[0,2,3]
		3		
ins		2	ls	[1,2,3]
		1	e	0
		0	pc	2 3 4 5

Imprime:
[0,1,2,3]
[1,0,2,3]

```
1   def ins(e, ls):
2       yield [e, *ls]
3       if ls:
4           for i in ins(e, ls[1:]):
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6
7   for i in ins(0, [1, 2, 3]):
8       print (i)
```

ins	6	ls	[2,3]
	5	e	0
	4	pc	2

ins	3	i	[0,2,3]
	2	ls	[1,2,3]
	1	e	0
	0	pc	2 3 4 5 4

GLOBAL	
ins	proc
i	[0,1,2,3] [1,0,2,3]
pc	7 8 7 8 7

Imprime:
[0,1,2,3]
[1,0,2,3]

```python
1  def ins(e, ls):
2      yield [e, *ls]
3      if ls:
4          for i in ins(e, ls[1:]):
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6
7  for i in ins(0, [1, 2, 3]):
8      print (i)
```

GLOBAL	
ins	proc
i	~~[0,1,2,3]~~ [1,0,2,3]
pc	~~7 8 7 8~~ 7

ins	6	ls	[2,3]
	5	e	0
	4	pc	~~2~~ 3

ins	3	i	[0,2,3]
	2	ls	[1,2,3]
	1	e	0
	0	pc	~~2 3 4 5~~ 4

Imprime:
[0,1,2,3]
[1,0,2,3]

```
1   def ins(e, ls):
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4           for i in ins(e, ls[1:]):
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6
7   for i in ins(0, [1, 2, 3]):
8       print (i)
```

GLOBAL	
ins	proc
i	[0,1,2,3] [1,0,2,3]
pc	7 8 7 8 7

ins	7	i	-
	6	ls	[2,3]
	5	e	0
	4	pc	2 3 4

ins	3	i	[0,2,3]
	2	ls	[1,2,3]
	1	e	0
	0	pc	2 3 4 5 4

Imprime:
[0,1,2,3]
[1,0,2,3]

```
1    def ins(e, ls):
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4            for i in ins(e, ls[1:]):
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6
7    for i in ins(0, [1, 2, 3]):
8        print (i)
```

GLOBAL	
ins	proc
i	[0,1,2,3] [1,0,2,3]
pc	7 8 7 8 7

ins	10	ls	[3]
	9	e	0
	8	pc	2

ins	7	i	-
	6	ls	[2,3]
	5	e	0
	4	pc	2 3 4

ins	3	i	[0,2,3]
	2	ls	[1,2,3]
	1	e	0
	0	pc	2 3 4 5 4

Imprime:
[0,1,2,3]
[1,0,2,3]

```
1   def ins(e, ls):
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```

ins	10	ls	[3]
	9	e	0
	8	pc	2

ins	7	i	[0,3]
	6	ls	[2,3]
	5	e	0
	4	pc	2 3 4 5

ins	3	i	[0,2,3]
	2	ls	[1,2,3]
	1	e	0
	0	pc	2 3 4 5 4

	GLOBAL
ins	proc
i	[0,1,2,3] [1,0,2,3]
pc	7 8 7 8 7

```
1   def ins(e, ls):
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7   for i in ins(0, [1, 2, 3]):
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```

	10	ls	[3]
ins	9	e	0
	8	pc	2

	7	i	[0,3]
	6	ls	[2,3]
ins	5	e	0
	4	pc	~~2~~ ~~3~~ ~~4~~ 5

	GLOBAL	
ins	proc	
i	~~[0,1,2,3]~~ [1,0,2,3]	
pc	~~7~~ ~~8~~ ~~7~~ ~~8~~ 7	

	3	i	~~[0,2,3]~~ [2,0,3]
	2	ls	[1,2,3]
ins	1	e	0
	0	pc	~~2~~ ~~3~~ ~~4~~ ~~5~~ ~~4~~ 5

Imprime:
[0,1,2,3]
[1,0,2,3]
[1,2,0,3]

```
1    def ins(e, ls):
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```

ins	10	ls	[3]
	9	e	0
	8	pc	2

ins	7	i	[0,3]
	6	ls	[2,3]
	5	e	0
	4	pc	2 3 4 5

ins	3	i	[0,2,3] [2,0,3]
	2	ls	[1,2,3]
	1	e	0
	0	pc	2 3 4 5 4 5

GLOBAL	
ins	proc
i	[0,1,2,3] [1,0,2,3] [1,2,0,3]
pc	7 8 7 8 7 8

Imprime:
[0,1,2,3]
[1,0,2,3]
[1,2,0,3]

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1    def ins(e, ls):
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	9	e	0
	8	pc	2

ins	7	i	[0,3]
	6	ls	[2,3]
	5	e	0
	4	pc	2 3 4 5

ins	3	i	[0,2,3] [2,0,3]
	2	ls	[1,2,3]
	1	e	0
	0	pc	2 3 4 5 4 5

GLOBAL	
ins	proc
i	[0,1,2,3] [1,0,2,3] [1,2,0,3]
pc	7 8 7 8 7 8 7

Imprime:
[0,1,2,3]
[1,0,2,3]
[1,2,0,3]

```
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6
7  for i in ins(0, [1, 2, 3]):
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```

	10	ls	[3]
ins	9	e	0
	8	pc	2

	7	i	[0,3]
ins	6	ls	[2,3]
	5	e	0
	4	pc	2 3 4 5

	3	i	[0,2,3] [2,0,3]
ins	2	ls	[1,2,3]
	1	e	0
	0	pc	2 3 4 5 4 5 4

GLOBAL	
ins	proc
i	[0,1,2,3] [1,0,2,3] [1,2,0,3]
pc	7 8 7 8 7 8 7

Imprime:
[0,1,2,3]
[1,0,2,3]
[1,2,0,3]

```
1  def ins(e, ls):
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ins	10	ls	[3]
	9	e	0
	8	pc	2

ins	7	i	[0,3]
	6	ls	[2,3]
	5	e	0
	4	pc	2 3 4 5 4

ins	3	i	[0,2,3] [2,0,3]
	2	ls	[1,2,3]
	1	e	0
	0	pc	2 3 4 5 4 5 4

GLOBAL	
ins	proc
i	[0,1,2,3] [1,0,2,3] [1,2,0,3]
pc	7 8 7 8 7 8 7

Imprime:
[0,1,2,3]
[1,0,2,3]
[1,2,0,3]

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1    def ins(e, ls):
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5                yield [ls[0], *i]
6
7    for i in ins(0, [1, 2, 3]):
8        print (i)
```

	10	ls	[3]
ins	9	e	0
	8	pc	2̶ 3

	7	i	[0,3]
	6	ls	[2,3]
ins	5	e	0
	4	pc	2̶ 3̶ 4̶ 5̶ 4

	3	i	[0̶,2̶,3̶] [2,0,3]
	2	ls	[1,2,3]
ins	1	e	0
	0	pc	2̶ 3̶ 4̶ 5̶ 4̶ 5̶ 4

GLOBAL	
ins	proc
i	[0̶,1̶,2̶,3̶] [1̶,0̶,2̶,3̶] [1,2,0,3]
pc	7̶ 8̶ 7̶ 8̶ 7̶ 8̶ 7

Imprime:
[0,1,2,3]
[1,0,2,3]
[1,2,0,3]

```python
1  def ins(e, ls):
2      yield [e, *ls]
3      if ls:
4          for i in ins(e, ls[1:]):
5              yield [ls[0], *i]
6
7  for i in ins(0, [1, 2, 3]):
8      print (i)
```

ins

11	i	-
10	ls	[3]
9	e	0
8	pc	2 3 4

ins

7	i	[0,3]
6	ls	[2,3]
5	e	0
4	pc	2 3 4 5 4

ins

3	i	[0,2,3] [2,0,3]
2	ls	[1,2,3]
1	e	0
0	pc	2 3 4 5 4 5 4

GLOBAL	
ins	proc
i	[0,1,2,3] [1,0,2,3] [1,2,0,3]
pc	7 8 7 8 7 8 7

Imprime:
[0,1,2,3]
[1,0,2,3]
[1,2,0,3]

```
1   def ins(e, ls):
2       yield [e, *ls]
3       if ls:
4           for i in ins(e, ls[1:]):
5               yield [ls[0], *i]
6
7   for i in ins(0, [1, 2, 3]):
8       print (i)
```

GLOBAL	
ins	proc
i	[0,1,2,3] [1,0,2,3] [1,2,0,3]
pc	7 8 7 8 7 8 7

ins	14	ls	[]
	13	e	0
	12	pc	2

ins	11	i	-
	10	ls	[3]
	9	e	0
	8	pc	2 3 4

ins	7	i	[0,3]
	6	ls	[2,3]
	5	e	0
	4	pc	2 3 4 5 4

ins	3	i	[0,2,3] [2,0,3]
	2	ls	[1,2,3]
	1	e	0
	0	pc	2 3 4 5 4 5 4

Imprime:
[0,1,2,3]
[1,0,2,3]
[1,2,0,3]

```
1  def ins(e, ls):
2      yield [e, *ls]
3      if ls:
4          for i in ins(e, ls[1:]):
5              yield [ls[0], *i]
6
7  for i in ins(0, [1, 2, 3]):
8      print (i)
```

	14	ls	[]
ins	13	e	0
	12	pc	2

	11	i	[0]
ins	10	ls	[3]
	9	e	0
	8	pc	2 3 4 5

	7	i	[0,3]
ins	6	ls	[2,3]
	5	e	0
	4	pc	2 3 4 5 4

	3	i	[0,2,3] [2,0,3]
ins	2	ls	[1,2,3]
	1	e	0
	0	pc	2 3 4 5 4 5 4

GLOBAL	
ins	proc
i	[0,1,2,3] [1,0,2,3] [1,2,0,3]
pc	7 8 7 8 7 8 7

ins	14	ls	[]
	13	e	0
	12	pc	2

ins	11	i	[0]
	10	ls	[3]
	9	e	0
	8	pc	2 3 4 5

ins	7	i	[0,3] [3,0]
	6	ls	[2,3]
	5	e	0
	4	pc	2 3 4 5 4 5

ins	3	i	[0,2,3] [2,0,3]
	2	ls	[1,2,3]
	1	e	0
	0	pc	2 3 4 5 4 5 4

```
1   def ins(e, ls):
2       yield [e, *ls]
3       if ls:
4           for i in ins(e, ls[1:]):
5               yield [ls[0], *i]
6
7   for i in ins(0, [1, 2, 3]):
8       print (i)
```

GLOBAL	
ins	proc
i	[0,1,2,3] [1,0,2,3] [1,2,0,3]
pc	7 8 7 8 7 8 7

Imprime:
[0,1,2,3]
[1,0,2,3]
[1,2,0,3]

```
1    def ins(e, ls):
2        yield [e, *ls]
3        if ls:
4            for i in ins(e, ls[1:]):
5                yield [ls[0], *i]
6
7    for i in ins(0, [1, 2, 3]):
8        print (i)
```

GLOBAL	
ins	proc
i	[0,1,2,3] [1,0,2,3] [1,2,0,3]
pc	7 8 7 8 7 8 7

ins	14	ls	[]
	13	e	0
	12	pc	2

ins	11	i	[0]
	10	ls	[3]
	9	e	0
	8	pc	2 3 4 5

ins	7	i	[0,3] [3,0]
	6	ls	[2,3]
	5	e	0
	4	pc	2 3 4 5 4 5

ins	3	i	[0,2,3] [2,0,3] [2,3,0]
	2	ls	[1,2,3]
	1	e	0
	0	pc	2 3 4 5 4 5 4 5

```
1  def ins(e, ls):
2      yield [e, *ls]
3      if ls:
4          for i in ins(e, ls[1:]):
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6
7  for i in ins(0, [1, 2, 3]):
8      print (i)
```

Imprime:
[0,1,2,3]
[1,0,2,3]
[1,2,0,3]
[1,2,3,0]

ins	14	ls	[]
	13	e	0
	12	pc	2

ins	11	i	[0]
	10	ls	[3]
	9	e	0
	8	pc	~~2 3 4~~ 5

ins	7	i	~~[0,3]~~ [3,0]
	6	ls	[2,3]
	5	e	0
	4	pc	~~2 3 4 5 4~~ 5

ins	3	i	~~[0,2,3]~~ ~~[2,0,3]~~ [2,3,0]
	2	ls	[1,2,3]
	1	e	0
	0	pc	~~2 3 4 5 4 5 4~~ 5

GLOBAL	
ins	proc
i	~~[0,1,2,3]~~ ~~[1,0,2,3]~~ ~~[1,2,0,3]~~ [1,2,3,0]
pc	~~7 8 7 8 7 8 7~~ 8

Imprime:
[0,1,2,3]
[1,0,2,3]
[1,2,0,3]
[1,2,3,0]

```
1  def ins(e, ls):
2      yield [e, *ls]
3      if ls:
4          for i in ins(e, ls[1:]):
5              yield [ls[0], *i]
6
7  for i in ins(0, [1, 2, 3]):
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```

ins			
	14	ls	[]
	13	e	0
	12	pc	2

ins			
	11	i	[0]
	10	ls	[3]
	9	e	0
	8	pc	~~2 3 4~~ 5

ins			
	7	i	~~[0,3]~~ [3,0]
	6	ls	[2,3]
	5	e	0
	4	pc	~~2 3 4 5 4~~ 5

ins			
	3	i	~~[0,2,3]~~ ~~[2,0,3]~~ [2,3,0]
	2	ls	[1,2,3]
	1	e	0
	0	pc	~~2 3 4 5 4 5 4~~ 5

GLOBAL	
ins	proc
i	~~[0,1,2,3]~~ ~~[1,0,2,3]~~ ~~[1,2,0,3]~~ [1,2,3,0]
pc	~~7 8 7 8 7 8 7 8~~ 7

```
1  def ins(e, ls):
2      yield [e, *ls]
3      if ls:
4          for i in ins(e, ls[1:]):
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```

Imprime:
[0,1,2,3]
[1,0,2,3]
[1,2,0,3]
[1,2,3,0]

	14	ls	[]
ins	13	e	0
	12	pc	2

	11	i	[0]
ins	10	ls	[3]
	9	e	0
	8	pc	~~2 3 4~~ 5

	7	i	~~[0,3]~~ [3,0]
ins	6	ls	[2,3]
	5	e	0
	4	pc	~~2 3 4 5 4~~ 5

	3	i	~~[0,2,3]~~ ~~[2,0,3]~~ [2,3,0]
ins	2	ls	[1,2,3]
	1	e	0
	0	pc	~~2 3 4 5 4 5 4 5~~ 4

GLOBAL	
ins	proc
i	~~[0,1,2,3]~~ ~~[1,0,2,3]~~ ~~[1,2,0,3]~~ [1,2,3,0]
pc	~~7 8 7 8 7 8 7 8~~ 7

Imprime:
[0,1,2,3]
[1,0,2,3]
[1,2,0,3]
[1,2,3,0]

```
1  def ins(e, ls):
2      yield [e, *ls]
3      if ls:
4          for i in ins(e, ls[1:]):
5              yield [ls[0], *i]
6
7  for i in ins(0, [1, 2, 3]):
8      print (i)
```

ins	14	ls	[]
	13	e	0
	12	pc	2

ins	11	i	[0]
	10	ls	[3]
	9	e	0
	8	pc	2 3 4 5

ins	7	i	[0,3] [3,0]
	6	ls	[2,3]
	5	e	0
	4	pc	2 3 4 5 4 5 4

ins	3	i	[0,2,3] [2,0,3] [2,3,0]
	2	ls	[1,2,3]
	1	e	0
	0	pc	2 3 4 5 4 5 4 5 4

GLOBAL	
ins	proc
i	[0,1,2,3] [1,0,2,3] [1,2,0,3] [1,2,3,0]
pc	7 8 7 8 7 8 7 8 7

```
1  def ins(e, ls):
2      yield [e, *ls]
3      if ls:
4          for i in ins(e, ls[1:]):
5              yield [ls[0], *i]
6
7  for i in ins(0, [1, 2, 3]):
8      print (i)
```

Imprime:
[0,1,2,3]
[1,0,2,3]
[1,2,0,3]
[1,2,3,0]

ins	14	ls	[]
	13	e	0
	12	pc	2

ins	11	i	[0]
	10	ls	[3]
	9	e	0
	8	pc	2 3 4 5 4

ins	7	i	[0,3] [3,0]
	6	ls	[2,3]
	5	e	0
	4	pc	2 3 4 5 4 5 4

ins	3	i	[0,2,3] [2,0,3] [2,3,0]
	2	ls	[1,2,3]
	1	e	0
	0	pc	2 3 4 5 4 5 4 5 4

GLOBAL	
ins	proc
i	[0,1,2,3] [1,0,2,3] [1,2,0,3] [1,2,3,0]
pc	7 8 7 8 7 8 7 8 7

Imprime:
[0,1,2,3]
[1,0,2,3]
[1,2,0,3]
[1,2,3,0]

```
1    def ins(e, ls):
2        yield [e, *ls]
3        if ls:
4            for i in ins(e, ls[1:]):
5                yield [ls[0], *i]
6
7    for i in ins(0, [1, 2, 3]):
8        print (i)
```

	14	ls	[]
ins	13	e	0
	12	pc	~~2~~ 3

	11	i	[0]
ins	10	ls	[3]
	9	e	0
	8	pc	~~2 3 4 5~~ 4

	7	i	~~[0,3]~~ [3,0]
ins	6	ls	[2,3]
	5	e	0
	4	pc	~~2 3 4 5 4 5~~ 4

	3	i	~~[0,2,3]~~ ~~[2,0,3]~~ [2,3,0]
ins	2	ls	[1,2,3]
	1	e	0
	0	pc	~~2 3 4 5 4 5 4 5~~ 4

GLOBAL	
ins	proc
i	~~[0,1,2,3]~~ ~~[1,0,2,3]~~ ~~[1,2,0,3]~~ [1,2,3,0]
pc	~~7 8 7 8 7 8 7 8~~ 7

```
1   def ins(e, ls):
2       yield [e, *ls]
3       if ls:
4           for i in ins(e, ls[1:]):
5               yield [ls[0], *i]
6
7   for i in ins(0, [1, 2, 3]):
8       print (i)
```

GLOBAL	
ins	proc
i	[0,1,2,3] [1,0,2,3] [1,2,0,3] [1,2,3,0]
pc	7 8 7 8 7 8 7 8 7

ins	14	ls	[]
	13	e	0
	12	pc	2 3

ins	11	i	[0]
	10	ls	[3]
	9	e	0
	8	pc	2 3 4 5 4

ins	7	i	[0,3] [3,0]
	6	ls	[2,3]
	5	e	0
	4	pc	2 3 4 5 4 5 4

ins	3	i	[0,2,3] [2,0,3] [2,3,0]
	2	ls	[1,2,3]
	1	e	0
	0	pc	2 3 4 5 4 5 4 5 4

Imprime:
[0,1,2,3]
[1,0,2,3]
[1,2,0,3]
[1,2,3,0]

```
1  def ins(e, ls):
2      yield [e, *ls]
3      if ls:
4          for i in ins(e, ls[1:]):
5              yield [ls[0], *i]
6
7  for i in ins(0, [1, 2, 3]):
8      print (i)
```

ins			
	14	ls	[]
	13	e	0
	12	pc	2 3

ins			
	11	i	[0]
	10	ls	[3]
	9	e	0
	8	pc	2 3 4 5 4

ins			
	7	i	[0,3] [3,0]
	6	ls	[2,3]
	5	e	0
	4	pc	2 3 4 5 4 5 4

ins			
	3	i	[0,2,3] [2,0,3] [2,3,0]
	2	ls	[1,2,3]
	1	e	0
	0	pc	2 3 4 5 4 5 4 5 4

GLOBAL	
ins	proc
i	[0,1,2,3] [1,0,2,3] [1,2,0,3] [1,2,3,0]
pc	7 8 7 8 7 8 7 8 7

```
1   def ins(e, ls):
2       yield [e, *ls]
3       if ls:
4           for i in ins(e, ls[1:]):
5               yield [ls[0], *i]
6
7   for i in ins(0, [1, 2, 3]):
8       print (i)
```

Imprime:
[0,1,2,3]
[1,0,2,3]
[1,2,0,3]
[1,2,3,0]

ins	14	ls	[]
	13	e	0
	12	pc	2̶ 3̶

ins	11	i	[0̶]̶
	10	ls	[3]
	9	e	0
	8	pc	2̶ 3̶ 4̶ 5̶ 4

ins	7	i	[0̶,3̶]̶ [3̶,0̶]̶
	6	ls	[2,3]
	5	e	0
	4	pc	2̶ 3̶ 4̶ 5̶ 4̶ 5̶ 4

ins	3	i	[0̶,2̶,3̶]̶ [2̶,0̶,3̶]̶ [2,3,0]
	2	ls	[1,2,3]
	1	e	0
	0	pc	2̶ 3̶ 4̶ 5̶ 4̶ 5̶ 4̶ 5̶ 4

GLOBAL	
ins	proc
i	[0̶,1̶,2̶,3̶]̶ [1̶,0̶,2̶,3̶]̶ [1̶,2̶,0̶,3̶]̶ [1,2,3,0]
pc	7̶ 8̶ 7̶ 8̶ 7̶ 8̶ 7̶ 8̶ 7

Imprime:
[0,1,2,3]
[1,0,2,3]
[1,2,0,3]
[1,2,3,0]

```
1   def ins(e, ls):
2   |    yield [e, *ls]
3   |    if ls:
4   |    |    for i in ins(e, ls[1:]):
5   |    |    |    yield [ls[0], *i]
6
7   for i in ins(0, [1, 2, 3]):
8   |    print (i)
```

ins	14	ls	[]
	13	e	0
	12	pc	~~2~~ ~~3~~

ins	11	i	~~[0]~~
	10	ls	[3]
	9	e	0
	8	pc	~~2~~ ~~3~~ ~~4~~ ~~5~~ 4

ins	7	i	~~[0,3]~~ ~~[3,0]~~
	6	ls	[2,3]
	5	e	0
	4	pc	~~2~~ ~~3~~ ~~4~~ ~~5~~ ~~4~~ ~~5~~ 4

ins	3	i	~~[0,2,3]~~ ~~[2,0,3]~~ ~~[2,3,0]~~
	2	ls	[1,2,3]
	1	e	0
	0	pc	~~2~~ ~~3~~ ~~4~~ ~~5~~ ~~4~~ ~~5~~ ~~4~~ ~~5~~ 4

GLOBAL	
ins	proc
i	~~[0,1,2,3]~~ ~~[1,0,2,3]~~ ~~[1,2,0,3]~~ [1,2,3,0]
pc	~~7~~ ~~8~~ ~~7~~ ~~8~~ ~~7~~ ~~8~~ ~~7~~ ~~8~~ 7

```
1  def ins(e, ls):
2      yield [e, *ls]
3      if ls:
4          for i in ins(e, ls[1:]):
5              yield [ls[0], *i]
6
7  for i in ins(0, [1, 2, 3]):
8      print (i)
```

Imprime:
[0,1,2,3]
[1,0,2,3]
[1,2,0,3]
[1,2,3,0]

ins	14	ls	[]
	13	e	0
	12	pc	2 3

ins	11	i	[0]
	10	ls	[3]
	9	e	0
	8	pc	2 3 4 5 4

ins	7	i	[0,3] [3,0]
	6	ls	[2,3]
	5	e	0
	4	pc	2 3 4 5 4 5 4

ins	3	i	[0,2,3] [2,0,3] [2,3,0]
	2	ls	[1,2,3]
	1	e	0
	0	pc	2 3 4 5 4 5 4 5 4

GLOBAL	
ins	proc
i	[0,1,2,3] [1,0,2,3] [1,2,0,3] [1,2,3,0]
pc	7 8 7 8 7 8 7 8 7

```
1  def ins(e, ls):
2      yield [e, *ls]
3      if ls:
4          for i in ins(e, ls[1:]):
5              yield [ls[0], *i]
6
7  for i in ins(0, [1, 2, 3]):
8      print (i)
```

Imprime:
[0,1,2,3]
[1,0,2,3]
[1,2,0,3]
[1,2,3,0]

ins	14	ls	[]
	13	e	0
	12	pc	~~2~~ ~~3~~

ins	11	i	~~[0]~~
	10	ls	[3]
	9	e	0
	8	pc	~~2~~ ~~3~~ ~~4~~ ~~5~~ ~~4~~

ins	7	i	~~[0,3]~~ ~~[3,0]~~
	6	ls	[2,3]
	5	e	0
	4	pc	~~2~~ ~~3~~ ~~4~~ ~~5~~ ~~4~~ ~~5~~ ~~4~~

ins	3	i	~~[0,2,3]~~ ~~[2,0,3]~~ ~~[2,3,0]~~
	2	ls	[1,2,3]
	1	e	0
	0	pc	~~2~~ ~~3~~ ~~4~~ ~~5~~ ~~4~~ ~~5~~ ~~4~~ ~~5~~ ~~4~~

GLOBAL	
ins	proc
i	~~[0,1,2,3]~~ ~~[1,0,2,3]~~ ~~[1,2,0,3]~~ ~~[1,2,3,0]~~
pc	~~7~~ ~~8~~ ~~7~~ ~~8~~ ~~7~~ ~~8~~ ~~7~~ ~~8~~ ~~7~~

Respuesta 3.b.i: Imprime:

Nota: La línea donde está posicionada la ejecución se encuentra arriba de la imagen del código.

Línea 15

```
 1  > def ins(e, ls): ···
 6
 7    def misterio(ls):
 8        if ls:
 9            for m in misterio(ls[1:]):
10                for i in ins(ls[0], m):
11                    yield i
12        else:
13            yield []
14
15    for m in misterio([1,2,3]):
16        print (m)
```

GLOBAL	
ins	proc
m	-
pc	15

Imprime:

Línea 8

```
1  > def ins(e, ls): …
6
7    def misterio(ls):
8        if ls:
9            for m in misterio(ls[1:]):
10               for i in ins(ls[0], m):
11                   yield i
12       else:
13           yield []
14
15   for m in misterio([1,2,3]):
16       print (m)
```

GLOBAL	
ins	proc
m	-
pc	15

misterio	1	ls	[1, 2, 3]
	0	pc	8

Imprime:

Línea 9

```
 1 > def ins(e, ls): ⋯
 6
 7   def misterio(ls):
 8       if ls:
 9           for m in misterio(ls[1:]):
10               for i in ins(ls[0], m):
11                   yield i
12       else:
13           yield []
14
15   for m in misterio([1,2,3]):
16       print (m)
```

GLOBAL	
ins	proc
m	-
pc	15

			m	-
misterio	2			
	1	ls		[1, 2, 3]
	0	pc		8 9

Imprime:

Línea 8

```
1 > def ins(e, ls): ⋯
6
7   def misterio(ls):
8       if ls:
9           for m in misterio(ls[1:]):
10              for i in ins(ls[0], m):
11                  yield i
12      else:
13          yield []
14
15  for m in misterio([1,2,3]):
16      print (m)
```

	GLOBAL
ins	proc
m	-
pc	15

misterio	4	ls	[2, 3]
	3	pc	8

misterio	2	m	-
	1	ls	[1, 2, 3]
	0	pc	8̶ 9

Imprime:

Línea 9

```
 1 > def ins(e, ls):…
 6
 7   def misterio(ls):
 8       if ls:
 9           for m in misterio(ls[1:]):
10               for i in ins(ls[0], m):
11                   yield i
12       else:
13           yield []
14
15   for m in misterio([1,2,3]):
16       print (m)
```

GLOBAL	
ins	proc
m	-
pc	15

	5	m	-
misterio	4	ls	[2, 3]
	3	pc	~~8~~ 9

	2	m	-
misterio	1	ls	[1, 2, 3]
	0	pc	~~8~~ 9

Imprime:

Línea 8

```
1 > def ins(e, ls): …
6
7   def misterio(ls):
8       if ls:
9           for m in misterio(ls[1:]):
10              for i in ins(ls[0], m):
11                  yield i
12      else:
13          yield []
14
15  for m in misterio([1,2,3]):
16      print (m)
```

GLOBAL	
ins	proc
m	-
pc	15

misterio	7	ls	[3]
	6	pc	8

misterio	5	m	-
	4	ls	[2, 3]
	3	pc	8 9

misterio	2	m	-
	1	ls	[1, 2, 3]
	0	pc	8 9

Imprime:

Línea 9

```
 1 > def ins(e, ls):…
 6
 7   def misterio(ls):
 8       if ls:
 9           for m in misterio(ls[1:]):
10               for i in ins(ls[0], m):
11                   yield i
12       else:
13           yield []
14
15   for m in misterio([1,2,3]):
16       print (m)
```

GLOBAL	
ins	proc
m	-
pc	15

	8	m	-
misterio	7	ls	[3]
	6	pc	~~8~~ 9

	5	m	-
misterio	4	ls	[2, 3]
	3	pc	~~8~~ 9

	2	m	-
misterio	1	ls	[1, 2, 3]
	0	pc	~~8~~ 9

Imprime:

Línea 8

```
1 > def ins(e, ls): …
6
7   def misterio(ls):
8       if ls:
9           for m in misterio(ls[1:]):
10              for i in ins(ls[0], m):
11                  yield i
12      else:
13          yield []
14
15  for m in misterio([1,2,3]):
16      print (m)
```

GLOBAL	
ins	proc
m	-
pc	15

misterio	10	ls	[]
	9	pc	8

misterio	8	m	-
	7	ls	[3]
	6	pc	8 9

misterio	5	m	-
	4	ls	[2, 3]
	3	pc	8 9

misterio	2	m	-
	1	ls	[1, 2, 3]
	0	pc	8 9

Imprime:

Línea 13

```
 1 > def ins(e, ls): …
 6
 7   def misterio(ls):
 8       if ls:
 9           for m in misterio(ls[1:]):
10               for i in ins(ls[0], m):
11                   yield i
12       else:
13           yield []
14
15   for m in misterio([1,2,3]):
16       print (m)
```

GLOBAL	
ins	proc
m	-
pc	15

misterio	10	ls	[]
	9	pc	8 13

misterio	8	m	-
	7	ls	[3]
	6	pc	8 9

misterio	5	m	-
	4	ls	[2, 3]
	3	pc	8 9

misterio	2	m	-
	1	ls	[1, 2, 3]
	0	pc	8 9

Imprime:

Línea 10

```
 1 > def ins(e, ls):…
 6
 7   def misterio(ls):
 8       if ls:
 9           for m in misterio(ls[1:]):
10               for i in ins(ls[0], m):
11                   yield i
12           else:
13               yield []
14
15   for m in misterio([1,2,3]):
16       print (m)
```

GLOBAL	
ins	proc
m	-
pc	15

misterio	10	ls	[]
	9	pc	8 13

misterio	11	i	-
	8	m	[]
	7	ls	[3]
	6	pc	8 9 10

misterio	5	m	-
	4	ls	[2, 3]
	3	pc	8 9

misterio	2	m	-
	1	ls	[1, 2, 3]
	0	pc	8 9

Imprime:

Línea 11

```
1  > def ins(e, ls): ···
6
7    def misterio(ls):
8        if ls:
9            for m in misterio(ls[1:]):
10               for i in ins(ls[0], m):
11                   yield i
12           else:
13               yield []
14
15   for m in misterio([1,2,3]):
16       print (m)
```

GLOBAL	
ins	proc
m	-
pc	15

misterio	10	ls	[]
	9	pc	8 13

misterio	11	i	[3]
	8	m	[]
	7	ls	[3]
	6	pc	8 9 10 11

misterio	5	m	-
	4	ls	[2, 3]
	3	pc	8 9

misterio	2	m	-
	1	ls	[1, 2, 3]
	0	pc	8 9

Imprime:

Línea 10

```
1  > def ins(e, ls): …
6
7    def misterio(ls):
8        if ls:
9            for m in misterio(ls[1:]):
10               for i in ins(ls[0], m):
11                   yield i
12       else:
13           yield []
14
15   for m in misterio([1,2,3]):
16       print (m)
```

GLOBAL	
ins	proc
m	-
pc	15

misterio	10	ls	[]
	9	pc	~~8~~ 13

misterio	11	i	[3]
	8	m	[]
	7	ls	[3]
	6	pc	~~8 9 10~~ 11

misterio	12	i	-
	5	m	[3]
	4	ls	[2, 3]
	3	pc	~~8 9~~ 10

misterio	2	m	-
	1	ls	[1, 2, 3]
	0	pc	~~8~~ 9

Imprime:

Línea 11

```
 1 > def ins(e, ls): …
 6
 7   def misterio(ls):
 8       if ls:
 9           for m in misterio(ls[1:]):
10               for i in ins(ls[0], m):
11                   yield i
12       else:
13           yield []
14
15   for m in misterio([1,2,3]):
16       print (m)
```

GLOBAL	
ins	proc
m	-
pc	15

misterio	10	ls	[]
	9	pc	~~8~~ 13

misterio	11	i	[3]
	8	m	[]
	7	ls	[3]
	6	pc	~~8 9 10~~ 11

misterio	12	i	[2,3]
	5	m	[3]
	4	ls	[2, 3]
	3	pc	~~8 9 10~~ 11

misterio	2	m	-
	1	ls	[1, 2, 3]
	0	pc	~~8~~ 9

Imprime:

Línea 10

```
1  > def ins(e, ls):…
6
7    def misterio(ls):
8        if ls:
9            for m in misterio(ls[1:]):
10               for i in ins(ls[0], m):
11                   yield i
12       else:
13           yield []
14
15   for m in misterio([1,2,3]):
16       print (m)
```

GLOBAL	
ins	proc
m	-
pc	15

misterio	10	ls	[]
	9	pc	8 13

misterio	11	i	[3]
	8	m	[]
	7	ls	[3]
	6	pc	8 9 10 11

misterio	12	i	[2,3]
	5	m	[3]
	4	ls	[2, 3]
	3	pc	8 9 10 11

misterio	13	i	-
	2	m	[2,3]
	1	ls	[1, 2, 3]
	0	pc	8 9 10

Imprime:

Línea 11

```
1  > def ins(e, ls):…
6
7    def misterio(ls):
8        if ls:
9            for m in misterio(ls[1:]):
10               for i in ins(ls[0], m):
11                   yield i
12        else:
13            yield []
14
15    for m in misterio([1,2,3]):
16        print (m)
```

GLOBAL	
ins	proc
m	-
pc	15

misterio	10	ls	[]
	9	pc	8 13

misterio	11	i	[3]
	8	m	[]
	7	ls	[3]
	6	pc	8 9 10 11

misterio	12	i	[2,3]
	5	m	[3]
	4	ls	[2, 3]
	3	pc	8 9 10 11

misterio	13	i	[1,2,3]
	2	m	[2,3]
	1	ls	[1, 2, 3]
	0	pc	8 9 10 11

Imprime:
[1,2,3]

Línea 16

```
 1  > def ins(e, ls):···
 6
 7    def misterio(ls):
 8        if ls:
 9            for m in misterio(ls[1:]):
10                for i in ins(ls[0], m):
11                    yield i
12        else:
13            yield []
14
15    for m in misterio([1,2,3]):
16        print (m)
```

| misterio | 10 | ls | [] |
| | 9 | pc | 8 13 |

misterio	11	i	[3]
	8	m	[]
	7	ls	[3]
	6	pc	8 9 10 11

misterio	12	i	[2,3]
	5	m	[3]
	4	ls	[2, 3]
	3	pc	8 9 10 11

misterio	13	i	[1,2,3]
	2	m	[2,3]
	1	ls	[1, 2, 3]
	0	pc	8 9 10 11

GLOBAL	
ins	proc
m	[1,2,3]
pc	15 16

Imprime:
[1,2,3]

Línea 15

```
 1 > def ins(e, ls): ⋯
 6
 7   def misterio(ls):
 8       if ls:
 9           for m in misterio(ls[1:]):
10               for i in ins(ls[0], m):
11                   yield i
12       else:
13           yield []
14
15   for m in misterio([1,2,3]):
16       print (m)
```

GLOBAL	
ins	proc
m	[1,2,3]
pc	~~15~~ ~~16~~ 15

misterio	10	ls	[]
	9	pc	~~8~~ 13

misterio	11	i	[3]
	8	m	[]
	7	ls	[3]
	6	pc	~~8~~ ~~9~~ ~~10~~ 11

misterio	12	i	[2,3]
	5	m	[3]
	4	ls	[2, 3]
	3	pc	~~8~~ ~~9~~ ~~10~~ 11

misterio	13	i	[1,2,3]
	2	m	[2,3]
	1	ls	[1, 2, 3]
	0	pc	~~8~~ ~~9~~ ~~10~~ 11

Imprime:
[1,2,3]

Línea 10

```
1 > def ins(e, ls): …
6
7   def misterio(ls):
8       if ls:
9           for m in misterio(ls[1:]):
10              for i in ins(ls[0], m):
11                  yield i
12          else:
13              yield []
14
15  for m in misterio([1,2,3]):
16      print (m)
```

GLOBAL	
ins	proc
m	[1,2,3]
pc	~~15 16~~ 15

misterio

10	ls	[]
9	pc	~~8~~ 13

misterio

11	i	[3]
8	m	[]
7	ls	[3]
6	pc	~~8 9 10~~ 11

misterio

12	i	[2,3]
5	m	[3]
4	ls	[2, 3]
3	pc	~~8 9 10~~ 11

misterio

13	i	[1,2,3]
2	m	[2,3]
1	ls	[1, 2, 3]
0	pc	~~8 9 10 11~~ 10

Imprime:
[1,2,3]

Línea 11

```
1 > def ins(e, ls): …
6
7   def misterio(ls):
8       if ls:
9           for m in misterio(ls[1:]):
10              for i in ins(ls[0], m):
11                  yield i
12          else:
13              yield []
14
15      for m in misterio([1,2,3]):
16          print (m)
```

GLOBAL	
ins	proc
m	[1,2,3]
pc	~~15~~ ~~16~~ 15

misterio	10	ls	[]
	9	pc	~~8~~ 13

misterio	11	i	[3]
	8	m	[]
	7	ls	[3]
	6	pc	~~8 9 10~~ 11

misterio	12	i	[2,3]
	5	m	[3]
	4	ls	[2, 3]
	3	pc	~~8 9 10~~ 11

misterio	13	i	~~[1,2,3]~~ [2,1,3]
	2	m	[2,3]
	1	ls	[1, 2, 3]
	0	pc	~~8 9 10 11 10~~ 11

Imprime:
[1,2,3]
[2,1,3]

Línea 16

```
 1 > def ins(e, ls): …
 6
 7   def misterio(ls):
 8       if ls:
 9           for m in misterio(ls[1:]):
10               for i in ins(ls[0], m):
11                   yield i
12       else:
13           yield []
14
15   for m in misterio([1,2,3]):
16       print (m)
```

GLOBAL	
ins	proc
m	[1,2,3] [2,1,3]
pc	15 16 15 16

misterio	10	ls	[]
	9	pc	8 13

misterio	11	i	[3]
	8	m	[]
	7	ls	[3]
	6	pc	8 9 10 11

misterio	12	i	[2,3]
	5	m	[3]
	4	ls	[2, 3]
	3	pc	8 9 10 11

misterio	13	i	[1,2,3] [2,1,3]
	2	m	[2,3]
	1	ls	[1, 2, 3]
	0	pc	8 9 10 11 10 11

Imprime:
[1,2,3]
[2,1,3]

Línea 15

```
 1 > def ins(e, ls):···
 6
 7   def misterio(ls):
 8       if ls:
 9           for m in misterio(ls[1:]):
10               for i in ins(ls[0], m):
11                   yield i
12       else:
13           yield []
14
15   for m in misterio([1,2,3]):
16       print (m)
```

GLOBAL	
ins	proc
m	[1,2,3] [2,1,3]
pc	15 16 15 16 15

misterio	10	ls	[]
	9	pc	8 13

misterio	11	i	[3]
	8	m	[]
	7	ls	[3]
	6	pc	8 9 10 11

misterio	12	i	[2,3]
	5	m	[3]
	4	ls	[2, 3]
	3	pc	8 9 10 11

misterio	13	i	[1,2,3] [2,1,3]
	2	m	[2,3]
	1	ls	[1, 2, 3]
	0	pc	8 9 10 11 10 11

Imprime:
[1,2,3]
[2,1,3]

Línea 10

```
 1 > def ins(e, ls): ...
 6
 7   def misterio(ls):
 8       if ls:
 9           for m in misterio(ls[1:]):
10               for i in ins(ls[0], m):
11                   yield i
12       else:
13           yield []
14
15   for m in misterio([1,2,3]):
16       print (m)
```

| misterio | 10 | ls | [] |
| | 9 | pc | 8 13 |

misterio	11	i	[3]
	8	m	[]
	7	ls	[3]
	6	pc	8 9 10 11

misterio	12	i	[2,3]
	5	m	[3]
	4	ls	[2, 3]
	3	pc	8 9 10 11

misterio	13	i	[1,2,3] [2,1,3]
	2	m	[2,3]
	1	ls	[1, 2, 3]
	0	pc	8 9 10 11 10 11 10

GLOBAL	
ins	proc
m	[1,2,3] [2,1,3]
pc	15 16 15 16 15

Imprime:
[1,2,3]
[2,1,3]

Línea 11

```
 1 > def ins(e, ls): …
 6
 7   def misterio(ls):
 8       if ls:
 9           for m in misterio(ls[1:]):
10               for i in ins(ls[0], m):
11                   yield i
12       else:
13           yield []
14
15   for m in misterio([1,2,3]):
16       print (m)
```

GLOBAL	
ins	proc
m	[1,2,3] [2,1,3]
pc	15 16 15 16 15

misterio	10	ls	[]
	9	pc	8 13

misterio	11	i	[3]
	8	m	[]
	7	ls	[3]
	6	pc	8 9 10 11

misterio	12	i	[2,3]
	5	m	[3]
	4	ls	[2, 3]
	3	pc	8 9 10 11

misterio	13	i	[1,2,3] [2,1,3] [2,3,1]
	2	m	[2,3]
	1	ls	[1, 2, 3]
	0	pc	8 9 10 11 10 11 10 11

Imprime:
[1,2,3]
[2,1,3]
[2,3,1]

Línea 16

```
 1 > def ins(e, ls): ⋯
 6
 7   def misterio(ls):
 8       if ls:
 9           for m in misterio(ls[1:]):
10               for i in ins(ls[0], m):
11                   yield i
12       else:
13           yield []
14
15   for m in misterio([1,2,3]):
16       print (m)
```

GLOBAL	
ins	proc
m	[1,2,3] [2,1,3] [2,3,1]
pc	15 16 15 16 15 16

misterio	10	ls	[]
	9	pc	8 13

misterio	11	i	[3]
	8	m	[]
	7	ls	[3]
	6	pc	8 9 10 11

misterio	12	i	[2,3]
	5	m	[3]
	4	ls	[2, 3]
	3	pc	8 9 10 11

misterio	13	i	[1,2,3] [2,1,3] [2,3,1]
	2	m	[2,3]
	1	ls	[1, 2, 3]
	0	pc	8 9 10 11 10 11 10 11

Imprime:
[1,2,3]
[2,1,3]
[2,3,1]

Línea 15

```
 1 > def ins(e, ls): ⋯
 6
 7   def misterio(ls):
 8       if ls:
 9           for m in misterio(ls[1:]):
10               for i in ins(ls[0], m):
11                   yield i
12       else:
13           yield []
14
15   for m in misterio([1,2,3]):
16       print (m)
```

GLOBAL	
ins	proc
m	[1,2,3] [2,1,3] [2,3,1]
pc	15 16 15 16 15 16 15

misterio	10	ls	[]
	9	pc	8 13

misterio	11	i	[3]
	8	m	[]
	7	ls	[3]
	6	pc	8 9 10 11

misterio	12	i	[2,3]
	5	m	[3]
	4	ls	[2, 3]
	3	pc	8 9 10 11

misterio	13	i	[1,2,3] [2,1,3] [2,3,1]
	2	m	[2,3]
	1	ls	[1, 2, 3]
	0	pc	8 9 10 11 10 11 10 11

Imprime:
[1,2,3]
[2,1,3]
[2,3,1]

Línea 10

```python
 1 > def ins(e, ls): ⋯
 6
 7   def misterio(ls):
 8       if ls:
 9           for m in misterio(ls[1:]):
10               for i in ins(ls[0], m):
11                   yield i
12       else:
13           yield []
14
15   for m in misterio([1,2,3]):
16       print (m)
```

GLOBAL	
ins	proc
m	[1,2,3] [2,1,3] [2,3,1]
pc	15 16 15 16 15 16 15

misterio	10	ls	[]
	9	pc	8 13

misterio	11	i	[3]
	8	m	[]
	7	ls	[3]
	6	pc	8 9 10 11

misterio	12	i	[2,3]
	5	m	[3]
	4	ls	[2, 3]
	3	pc	8 9 10 11

misterio	13	i	[1,2,3] [2,1,3] [2,3,1]
	2	m	[2,3]
	1	ls	[1, 2, 3]
	0	pc	8 9 10 11 10 11 10 11 10

Imprime:
[1,2,3]
[2,1,3]
[2,3,1]

Línea 9

```python
 1 > def ins(e, ls):…
 6
 7   def misterio(ls):
 8       if ls:
 9           for m in misterio(ls[1:]):
10               for i in ins(ls[0], m):
11                   yield i
12           else:
13               yield []
14
15   for m in misterio([1,2,3]):
16       print (m)
```

GLOBAL	
ins	proc
m	~~[1,2,3]~~ ~~[2,1,3]~~ [2,3,1]
pc	~~15~~ ~~16~~ ~~15~~ ~~16~~ ~~15~~ ~~16~~ 15

misterio	10	ls	[]
	9	pc	~~8~~ 13

misterio	11	i	[3]
	8	m	[]
	7	ls	[3]
	6	pc	~~8 9 10~~ 11

misterio	12	i	[2,3]
	5	m	[3]
	4	ls	[2, 3]
	3	pc	~~8 9 10~~ 11

misterio	13	i	~~[1,2,3]~~ ~~[2,1,3]~~ [2,3,1]
	2	m	[2,3]
	1	ls	[1, 2, 3]
	0	pc	~~8 9 10 11 10 11 10 11 10~~ 9

Imprime:
[1,2,3]
[2,1,3]
[2,3,1]

Línea 10

```
 1 > def ins(e, ls):⋯
 6
 7   def misterio(ls):
 8       if ls:
 9           for m in misterio(ls[1:]):
10               for i in ins(ls[0], m):
11                   yield i
12       else:
13           yield []
14
15   for m in misterio([1,2,3]):
16       print (m)
```

GLOBAL	
ins	proc
m	[1,2,3] [2,1,3] [2,3,1]
pc	15 16 15 16 15 16 15

misterio	10	ls	[]
	9	pc	8 13

misterio	11	i	[3]
	8	m	[]
	7	ls	[3]
	6	pc	8 9 10 11

misterio	12	i	[2,3]
	5	m	[3]
	4	ls	[2, 3]
	3	pc	8 9 10 11 10

misterio	13	i	[1,2,3] [2,1,3] [2,3,1]
	2	m	[2,3]
	1	ls	[1, 2, 3]
	0	pc	8 9 10 11 10 11 10 11 10 9

Imprime:
[1,2,3]
[2,1,3]
[2,3,1]

Línea 11

```
1  > def ins(e, ls): …
6
7    def misterio(ls):
8        if ls:
9            for m in misterio(ls[1:]):
10               for i in ins(ls[0], m):
11                   yield i
12       else:
13           yield []
14
15   for m in misterio([1,2,3]):
16       print (m)
```

GLOBAL	
ins	proc
m	~~[1,2,3]~~ ~~[2,1,3]~~ [2,3,1]
pc	~~15 16 15 16 15 16~~ 15

misterio			
	10	ls	[]
	9	pc	~~8~~ 13

misterio			
	11	i	[3]
	8	m	[]
	7	ls	[3]
	6	pc	~~8 9 10~~ 11

misterio			
	12	i	~~[2,3]~~ [3,2]
	5	m	[3]
	4	ls	[2, 3]
	3	pc	~~8 9 10 11 10~~ 11

misterio			
	13	i	~~[1,2,3]~~ ~~[2,1,3]~~ [2,3,1]
	2	m	[2,3]
	1	ls	[1, 2, 3]
	0	pc	~~8 9 10 11 10 11 10 11 10~~ 9

Imprime:
[1,2,3]
[2,1,3]
[2,3,1]

Línea 10

```
 1  > def ins(e, ls): ⋯
 6
 7    def misterio(ls):
 8        if ls:
 9            for m in misterio(ls[1:]):
10                for i in ins(ls[0], m):
11                    yield i
12        else:
13            yield []
14
15    for m in misterio([1,2,3]):
16        print (m)
```

GLOBAL	
ins	proc
m	~~[1,2,3]~~ ~~[2,1,3]~~ [2,3,1]
pc	~~15~~ ~~16~~ ~~15~~ ~~16~~ ~~15~~ ~~16~~ 15

misterio			
	10	ls	[]
	9	pc	~~8~~ 13

misterio			
	11	i	[3]
	8	m	[]
	7	ls	[3]
	6	pc	~~8~~ ~~9~~ ~~10~~ 11

misterio			
	12	i	~~[2,3]~~ [3,2]
	5	m	[3]
	4	ls	[2, 3]
	3	pc	~~8~~ ~~9~~ ~~10~~ ~~11~~ ~~10~~ 11

misterio			
	13	i	~~[1,2,3]~~ ~~[2,1,3]~~ [2,3,1]
	2	m	~~[2,3]~~ [3,2]
	1	ls	[1, 2, 3]
	0	pc	~~8~~ ~~9~~ ~~10~~ ~~11~~ ~~10~~ ~~11~~ ~~10~~ ~~11~~ ~~10~~ ~~9~~ 10

Imprime:
[1,2,3]
[2,1,3]
[2,3,1]

Línea 11

```
 1 > def ins(e, ls):···
 6
 7   def misterio(ls):
 8       if ls:
 9           for m in misterio(ls[1:]):
10               for i in ins(ls[0], m):
11                   yield i
12       else:
13           yield []
14
15   for m in misterio([1,2,3]):
16       print (m)
```

GLOBAL	
ins	proc
m	[1,2,3] [2,1,3] [2,3,1]
pc	15 16 15 16 15 16 15

misterio	10	ls	[]
	9	pc	8 13

misterio	11	i	[3]
	8	m	[]
	7	ls	[3]
	6	pc	8 9 10 11

misterio	12	i	[2,3] [3,2]
	5	m	[3]
	4	ls	[2, 3]
	3	pc	8 9 10 11 10 11

misterio	13	i	[1,2,3] [2,1,3] [2,3,1] [1,3,2]
	2	m	[2,3] [3,2]
	1	ls	[1, 2, 3]
	0	pc	8 9 10 11 10 11 10 11 10 9 10 11

Imprime:
[1,2,3]
[2,1,3]
[2,3,1]
[1,3,2]

Línea 16

```
 1  > def ins(e, ls): …
 6
 7    def misterio(ls):
 8        if ls:
 9            for m in misterio(ls[1:]):
10                for i in ins(ls[0], m):
11                    yield i
12        else:
13            yield []
14
15    for m in misterio([1,2,3]):
16        print (m)
```

GLOBAL	
ins	proc
m	~~[1,2,3]~~ ~~[2,1,3]~~ ~~[2,3,1]~~ [1,3,2]
pc	~~15 16 15 16 15 16 15~~ 16

misterio			
	10	ls	[]
	9	pc	~~8~~ 13

misterio			
	11	i	[3]
	8	m	[]
	7	ls	[3]
	6	pc	~~8 9 10~~ 11

misterio			
	12	i	~~[2,3]~~ [3,2]
	5	m	[3]
	4	ls	[2, 3]
	3	pc	~~8 9 10 11 10~~ 11

misterio			
	13	i	~~[1,2,3]~~ ~~[2,1,3]~~ ~~[2,3,1]~~ [1,3,2]
	2	m	~~[2,3]~~ [3,2]
	1	ls	[1, 2, 3]
	0	pc	~~8 9 10 11 10 11 10 11 10 9 10~~ 11

Imprime:
[1,2,3]
[2,1,3]
[2,3,1]
[1,3,2]

Línea 15

```
 1 > def ins(e, ls): ···
 6
 7   def misterio(ls):
 8       if ls:
 9           for m in misterio(ls[1:]):
10               for i in ins(ls[0], m):
11                   yield i
12       else:
13           yield []
14
15   for m in misterio([1,2,3]):
16       print (m)
```

GLOBAL	
ins	proc
m	[1,2,3] [2,1,3] [2,3,1] [1,3,2]
pc	15 16 15 16 15 16 15 16 15

misterio	10	ls	[]
	9	pc	8 13

misterio	11	i	[3]
	8	m	[]
	7	ls	[3]
	6	pc	8 9 10 11

misterio	12	i	[2,3] [3,2]
	5	m	[3]
	4	ls	[2, 3]
	3	pc	8 9 10 11 10 11

misterio	13	i	[1,2,3] [2,1,3] [2,3,1] [1,3,2]
	2	m	[2,3] [3,2]
	1	ls	[1, 2, 3]
	0	pc	8 9 10 11 10 11 10 11 10 9 10 11

Imprime:
[1,2,3]
[2,1,3]
[2,3,1]
[1,3,2]

Línea 10

```python
1  > def ins(e, ls): …
6
7    def misterio(ls):
8        if ls:
9            for m in misterio(ls[1:]):
10               for i in ins(ls[0], m):
11                   yield i
12       else:
13           yield []
14
15   for m in misterio([1,2,3]):
16       print (m)
```

GLOBAL	
ins	proc
m	~~[1,2,3]~~ ~~[2,1,3]~~ ~~[2,3,1]~~ [1,3,2]
pc	~~15~~ ~~16~~ ~~15~~ ~~16~~ ~~15~~ ~~16~~ ~~15~~ ~~16~~ 15

misterio

10	ls	[]
9	pc	~~8~~ 13

misterio

11	i	[3]
8	m	[]
7	ls	[3]
6	pc	~~8~~ ~~9~~ ~~10~~ 11

misterio

12	i	~~[2,3]~~ [3,2]
5	m	[3]
4	ls	[2, 3]
3	pc	~~8~~ ~~9~~ ~~10~~ ~~11~~ ~~10~~ 11

misterio

13	i	~~[1,2,3]~~ ~~[2,1,3]~~ ~~[2,3,1]~~ [1,3,2]
2	m	~~[2,3]~~ [3,2]
1	ls	[1, 2, 3]
0	pc	~~8~~ ~~9~~ ~~10~~ ~~11~~ ~~10~~ ~~11~~ ~~10~~ ~~11~~ ~~10~~ ~~9~~ ~~10~~ ~~11~~ 10

Imprime:
[1,2,3]
[2,1,3]
[2,3,1]
[1,3,2]

Línea 11

```python
 1 > def ins(e, ls): …
 6
 7   def misterio(ls):
 8       if ls:
 9           for m in misterio(ls[1:]):
10               for i in ins(ls[0], m):
11                   yield i
12       else:
13           yield []
14
15   for m in misterio([1,2,3]):
16       print (m)
```

misterio	10	ls	[]
	9	pc	8 13

misterio	11	i	[3]
	8	m	[]
	7	ls	[3]
	6	pc	8 9 10 11

misterio	12	i	[2,3] [3,2]
	5	m	[3]
	4	ls	[2, 3]
	3	pc	8 9 10 11 10 11

misterio	13	i	[1,2,3] [2,1,3] [2,3,1] [1,3,2] [3,1,2]
	2	m	[2,3] [3,2]
	1	ls	[1, 2, 3]
	0	pc	8 9 10 11 10 11 10 11 10 9 10 11 10 11

GLOBAL	
ins	proc
m	[1,2,3] [2,1,3] [2,3,1] [1,3,2]
pc	15 16 15 16 15 16 15 16 15

Imprime:
[1,2,3]
[2,1,3]
[2,3,1]
[1,3,2]
[3,1,2]

Línea 16

```python
 1 > def ins(e, ls): ⋯
 6
 7   def misterio(ls):
 8       if ls:
 9           for m in misterio(ls[1:]):
10               for i in ins(ls[0], m):
11                   yield i
12       else:
13           yield []
14
15   for m in misterio([1,2,3]):
16       print (m)
```

| misterio | 10 | ls | [] |
| | 9 | pc | ~~8~~ 13 |

misterio	11	i	[3]
	8	m	[]
	7	ls	[3]
	6	pc	~~8 9 10~~ 11

misterio	12	i	~~[2,3]~~ [3,2]
	5	m	[3]
	4	ls	[2, 3]
	3	pc	~~8 9 10 11 10~~ 11

misterio	13	i	~~[1,2,3] [2,1,3] [2,3,1] [1,3,2]~~ [3,1,2]
	2	m	~~[2,3]~~ [3,2]
	1	ls	[1, 2, 3]
	0	pc	~~8 9 10 11 10 11 10 11 10 9 10 11 10~~ 11

GLOBAL	
ins	proc
m	~~[1,2,3] [2,1,3] [2,3,1] [1,3,2]~~ [3,1,2]
pc	~~15 16 15 16 15 16 15 16 15~~ 16

Imprime:
[1,2,3]
[2,1,3]
[2,3,1]
[1,3,2]
[3,1,2]

Línea 15

```python
1  > def ins(e, ls):···
6
7    def misterio(ls):
8        if ls:
9            for m in misterio(ls[1:]):
10               for i in ins(ls[0], m):
11                   yield i
12       else:
13           yield []
14
15   for m in misterio([1,2,3]):
16       print (m)
```

GLOBAL	
ins	proc
m	[1,2,3] [2,1,3] [2,3,1] [1,3,2] [3,1,2]
pc	15 16 15 16 15 16 15 16 15 16 15

misterio	10	ls	[]
	9	pc	8 13

misterio	11	i	[3]
	8	m	[]
	7	ls	[3]
	6	pc	8 9 10 11

misterio	12	i	[2,3] [3,2]
	5	m	[3]
	4	ls	[2, 3]
	3	pc	8 9 10 11 10 11

misterio	13	i	[1,2,3] [2,1,3] [2,3,1] [1,3,2] [3,1,2]
	2	m	[2,3] [3,2]
	1	ls	[1, 2, 3]
	0	pc	8 9 10 11 10 11 10 11 10 9 10 11 10 11

Imprime:
[1,2,3]
[2,1,3]
[2,3,1]
[1,3,2]
[3,1,2]

Línea 10

```
 1 > def ins(e, ls): …
 6
 7   def misterio(ls):
 8       if ls:
 9           for m in misterio(ls[1:]):
10               for i in ins(ls[0], m):
11                   yield i
12       else:
13           yield []
14
15   for m in misterio([1,2,3]):
16       print (m)
```

GLOBAL	
ins	proc
m	[1,2,3] [2,1,3] [2,3,1] [1,3,2] [3,1,2]
pc	15 16 15 16 15 16 15 16 15 16 15

misterio	10	ls	[]
	9	pc	8 13

misterio	11	i	[3]
	8	m	[]
	7	ls	[3]
	6	pc	8 9 10 11

misterio	12	i	[2,3] [3,2]
	5	m	[3]
	4	ls	[2, 3]
	3	pc	8 9 10 11 10 11

misterio	13	i	[1,2,3] [2,1,3] [2,3,1] [1,3,2] [3,1,2]
	2	m	[2,3] [3,2]
	1	ls	[1, 2, 3]
	0	pc	8 9 10 11 10 11 10 11 10 9 10 11 10 11 10

Imprime:
[1,2,3]
[2,1,3]
[2,3,1]
[1,3,2]
[3,1,2]

Línea 11

```
 1 > def ins(e, ls): …
 6
 7   def misterio(ls):
 8       if ls:
 9           for m in misterio(ls[1:]):
10               for i in ins(ls[0], m):
11                   yield i
12       else:
13           yield []
14
15   for m in misterio([1,2,3]):
16       print (m)
```

GLOBAL	
ins	proc
m	[1,2,3] [2,1,3] [2,3,1] [1,3,2] [3,1,2]
pc	15 16 15 16 15 16 15 16 15 16 15

misterio	10	ls	[]
	9	pc	8 13

misterio	11	i	[3]
	8	m	[]
	7	ls	[3]
	6	pc	8 9 10 11

misterio	12	i	[2,3] [3,2]
	5	m	[3]
	4	ls	[2, 3]
	3	pc	8 9 10 11 10 11

misterio	13	i	[1,2,3] [2,1,3] [2,3,1] [1,3,2] [3,1,2] [3,2,1]
	2	m	[2,3] [3,2]
	1	ls	[1, 2, 3]
	0	pc	8 9 10 11 10 11 10 11 10 9 10 11 10 11 10 11

Imprime:
[1,2,3]
[2,1,3]
[2,3,1]
[1,3,2]
[3,1,2]
[3,2,1]

Línea 16

```
1  > def ins(e, ls): …
6
7    def misterio(ls):
8        if ls:
9            for m in misterio(ls[1:]):
10               for i in ins(ls[0], m):
11                   yield i
12       else:
13           yield []
14
15   for m in misterio([1,2,3]):
16       print (m)
```

GLOBAL	
ins	proc
m	[1,2,3] [2,1,3] [2,3,1] [1,3,2] [3,1,2] [3,2,1]
pc	15 16 15 16 15 16 15 16 15 16 15 16

misterio	10	ls	[]
	9	pc	8 13

misterio	11	i	[3]
	8	m	[]
	7	ls	[3]
	6	pc	8 9 10 11

misterio	12	i	[2,3] [3,2]
	5	m	[3]
	4	ls	[2, 3]
	3	pc	8 9 10 11 10 11

misterio	13	i	[1,2,3] [2,1,3] [2,3,1] [1,3,2] [3,1,2] [3,2,1]
	2	m	[2,3] [3,2]
	1	ls	[1, 2, 3]
	0	pc	8 9 10 11 10 11 10 11 10 9 10 11 10 11 10 11

Imprime:
[1,2,3]
[2,1,3]
[2,3,1]
[1,3,2]
[3,1,2]
[3,2,1]

Línea 15

```
1  > def ins(e, ls): …
6
7    def misterio(ls):
8        if ls:
9            for m in misterio(ls[1:]):
10               for i in ins(ls[0], m):
11                   yield i
12           else:
13               yield []
14
15   for m in misterio([1,2,3]):
16       print (m)
```

GLOBAL	
ins	proc
m	[1,2,3] [2,1,3] [2,3,1] [1,3,2] [3,1,2] [3,2,1]
pc	15 16 15 16 15 16 15 16 15 16 15 16 15

misterio	10	ls	[]
	9	pc	8 13

misterio	11	i	[3]
	8	m	[]
	7	ls	[3]
	6	pc	8 9 10 11

misterio	12	i	[2,3] [3,2]
	5	m	[3]
	4	ls	[2, 3]
	3	pc	8 9 10 11 10 11

misterio	13	i	[1,2,3] [2,1,3] [2,3,1] [1,3,2] [3,1,2] [3,2,1]
	2	m	[2,3] [3,2]
	1	ls	[1, 2, 3]
	0	pc	8 9 10 11 10 11 10 11 10 9 10 11 10 11 10 11

Imprime:
[1,2,3]
[2,1,3]
[2,3,1]
[1,3,2]
[3,1,2]
[3,2,1]

Línea 10

```
 1 > def ins(e, ls): …
 6
 7   def misterio(ls):
 8       if ls:
 9           for m in misterio(ls[1:]):
10               for i in ins(ls[0], m):
11                   yield i
12       else:
13           yield []
14
15   for m in misterio([1,2,3]):
16       print (m)
```

GLOBAL	
ins	proc
m	~~[1,2,3]~~ ~~[2,1,3]~~ ~~[2,3,1]~~ ~~[1,3,2]~~ ~~[3,1,2]~~ [3,2,1]
pc	~~15~~ ~~16~~ ~~15~~ ~~16~~ ~~15~~ ~~16~~ ~~15~~ ~~16~~ ~~15~~ ~~16~~ ~~15~~ ~~16~~ 15

misterio	10	ls	[]
	9	pc	~~8~~ 13

misterio	11	i	[3]
	8	m	[]
	7	ls	[3]
	6	pc	~~8 9 10~~ 11

misterio	12	i	~~[2,3]~~ [3,2]
	5	m	[3]
	4	ls	[2, 3]
	3	pc	~~8 9 10 11 10~~ 11

misterio	13	i	~~[1,2,3]~~ ~~[2,1,3]~~ ~~[2,3,1]~~ ~~[1,3,2]~~ ~~[3,1,2]~~ [3,2,1]
	2	m	~~[2,3]~~ [3,2]
	1	ls	[1, 2, 3]
	0	pc	~~8 9 10 11 10 11 10 11 10 9 10 11 10 11 10 11~~ 10

Imprime:
[1,2,3]
[2,1,3]
[2,3,1]
[1,3,2]
[3,1,2]
[3,2,1]

Línea 9

```python
1 > def ins(e, ls):…
6
7    def misterio(ls):
8        if ls:
9            for m in misterio(ls[1:]):
10               for i in ins(ls[0], m):
11                   yield i
12           else:
13               yield []
14
15   for m in misterio([1,2,3]):
16       print (m)
```

GLOBAL	
ins	proc
m	~~[1,2,3]~~ ~~[2,1,3]~~ ~~[2,3,1]~~ ~~[1,3,2]~~ ~~[3,1,2]~~ [3,2,1]
pc	~~15~~ ~~16~~ ~~15~~ ~~16~~ ~~15~~ ~~16~~ ~~15~~ ~~16~~ ~~15~~ ~~16~~ ~~15~~ ~~16~~ 15

misterio	10	ls	[]
	9	pc	~~8~~ 13

misterio	11	i	[3]
	8	m	[]
	7	ls	[3]
	6	pc	~~8~~ ~~9~~ ~~10~~ 11

misterio	12	i	~~[2,3]~~ [3,2]
	5	m	[3]
	4	ls	[2, 3]
	3	pc	~~8~~ ~~9~~ ~~10~~ ~~11~~ ~~10~~ 11

misterio	13	i	~~[1,2,3]~~ ~~[2,1,3]~~ ~~[2,3,1]~~ ~~[1,3,2]~~ ~~[3,1,2]~~ [3,2,1]
	2	m	~~[2,3]~~ [3,2]
	1	ls	[1, 2, 3]
	0	pc	~~8~~ ~~9~~ ~~10~~ ~~11~~ ~~10~~ ~~11~~ ~~10~~ ~~11~~ ~~10~~ ~~9~~ ~~10~~ ~~11~~ ~~10~~ ~~11~~ ~~10~~ ~~11~~ ~~10~~ 9

Imprime:
[1,2,3]
[2,1,3]
[2,3,1]
[1,3,2]
[3,1,2]
[3,2,1]

Línea 10

```
 1  > def ins(e, ls): …
 6
 7    def misterio(ls):
 8        if ls:
 9            for m in misterio(ls[1:]):
10                for i in ins(ls[0], m):
11                    yield i
12        else:
13            yield []
14
15    for m in misterio([1,2,3]):
16        print (m)
```

| misterio | 10 | ls | [] |
| | 9 | pc | 8 13 |

misterio	11	i	[3]
	8	m	[]
	7	ls	[3]
	6	pc	8 9 10 11

misterio	12	i	[2,3] [3,2]
	5	m	[3]
	4	ls	[2, 3]
	3	pc	8 9 10 11 10 11 10

misterio	13	i	[1,2,3] [2,1,3] [2,3,1] [1,3,2] [3,1,2] [3,2,1]
	2	m	[2,3] [3,2]
	1	ls	[1, 2, 3]
	0	pc	8 9 10 11 10 11 10 11 10 9 10 11 10 11 10 11 10 9

GLOBAL	
ins	proc
m	[1,2,3] [2,1,3] [2,3,1] [1,3,2] [3,1,2] [3,2,1]
pc	15 16 15 16 15 16 15 16 15 16 15 16 15

Imprime:
[1,2,3]
[2,1,3]
[2,3,1]
[1,3,2]
[3,1,2]
[3,2,1]

Línea 9

```python
 1 > def ins(e, ls): …
 6
 7   def misterio(ls):
 8       if ls:
 9           for m in misterio(ls[1:]):
10               for i in ins(ls[0], m):
11                   yield i
12       else:
13           yield []
14
15   for m in misterio([1,2,3]):
16       print (m)
```

GLOBAL	
ins	proc
m	[1,2,3] [2,1,3] [2,3,1] [1,3,2] [3,1,2] [3,2,1]
pc	15 16 15 16 15 16 15 16 15 16 15 16 15

misterio			
	10	ls	[]
	9	pc	8 13

misterio			
	11	i	[3]
	8	m	[]
	7	ls	[3]
	6	pc	8 9 10 11

misterio			
	12	i	[2,3] [3,2]
	5	m	[3]
	4	ls	[2, 3]
	3	pc	8 9 10 11 10 11 10 9

misterio			
	13	i	[1,2,3] [2,1,3] [2,3,1] [1,3,2] [3,1,2] [3,2,1]
	2	m	[2,3] [3,2]
	1	ls	[1, 2, 3]
	0	pc	8 9 10 11 10 11 10 11 10 9 10 11 10 11 10 11 10 9

Imprime:
[1,2,3]
[2,1,3]
[2,3,1]
[1,3,2]
[3,1,2]
[3,2,1]

Línea 10

```python
1  > def ins(e, ls): …
6
7    def misterio(ls):
8        if ls:
9            for m in misterio(ls[1:]):
10               for i in ins(ls[0], m):
11                   yield i
12           else:
13               yield []
14
15       for m in misterio([1,2,3]):
16           print (m)
```

GLOBAL	
ins	proc
m	~~[1,2,3]~~ ~~[2,1,3]~~ ~~[2,3,1]~~ ~~[1,3,2]~~ ~~[3,1,2]~~ [3,2,1]
pc	~~15~~ ~~16~~ ~~15~~ ~~16~~ ~~15~~ ~~16~~ ~~15~~ ~~16~~ ~~15~~ ~~16~~ ~~15~~ ~~16~~ 15

misterio

10	ls	[]
9	pc	~~8~~ 13

misterio

11	i	[3]
8	m	[]
7	ls	[3]
6	pc	~~8~~ ~~9~~ ~~10~~ ~~11~~ 10

misterio

12	i	~~[2,3]~~ [3,2]
5	m	[3]
4	ls	[2, 3]
3	pc	~~8~~ ~~9~~ ~~10~~ ~~11~~ ~~10~~ ~~11~~ ~~10~~ 9

misterio

13	i	~~[1,2,3]~~ ~~[2,1,3]~~ ~~[2,3,1]~~ ~~[1,3,2]~~ ~~[3,1,2]~~ [3,2,1]
2	m	~~[2,3]~~ [3,2]
1	ls	[1, 2, 3]
0	pc	~~8~~ ~~9~~ ~~10~~ ~~11~~ ~~10~~ ~~11~~ ~~10~~ ~~11~~ ~~10~~ ~~9~~ ~~10~~ ~~11~~ ~~10~~ ~~11~~ ~~10~~ ~~11~~ ~~10~~ 9

Imprime:
[1,2,3]
[2,1,3]
[2,3,1]
[1,3,2]
[3,1,2]
[3,2,1]

```python
1  > def ins(e, ls): …
6
7    def misterio(ls):
8        if ls:
9            for m in misterio(ls[1:]):
10               for i in ins(ls[0], m):
11                   yield i
12           else:
13               yield []
14
15   for m in misterio([1,2,3]):
16       print (m)
```

misterio			
	10	ls	[]
	9	pc	~~8~~ 13

misterio			
	11	i	[3]
	8	m	[]
	7	ls	[3]
	6	pc	~~8 9 10 11 10~~ 9

misterio			
	12	i	~~[2,3]~~ [3,2]
	5	m	[3]
	4	ls	[2, 3]
	3	pc	~~8 9 10 11 10 11 10~~ 9

misterio			
	13	i	~~[1,2,3] [2,1,3] [2,3,1] [1,3,2] [3,1,2]~~ [3,2,1]
	2	m	~~[2,3]~~ [3,2]
	1	ls	[1, 2, 3]
	0	pc	~~8 9 10 11 10 11 10 11 10 9 10 11 10 11 10 11 10~~ 9

GLOBAL	
ins	proc
m	~~[1,2,3] [2,1,3] [2,3,1] [1,3,2] [3,1,2]~~ [3,2,1]
pc	~~15 16 15 16 15 16 15 16 15 16 15 16~~ 15

Imprime:
[1,2,3]
[2,1,3]
[2,3,1]
[1,3,2]
[3,1,2]
[3,2,1]

```
1  > def ins(e, ls): …
6
7    def misterio(ls):
8        if ls:
9            for m in misterio(ls[1:]):
10               for i in ins(ls[0], m):
11                   yield i
12           else:
13               yield []
14
15   for m in misterio([1,2,3]):
16       print (m)
```

misterio			
	10	ls	[]
	9	pc	~~8~~ 13

misterio			
	11	i	[3]
	8	m	~~[]~~
	7	ls	[3]
	6	pc	~~8 9 10 11 10~~ 9

misterio			
	12	i	~~[2,3]~~ [3,2]
	5	m	[3]
	4	ls	[2, 3]
	3	pc	~~8 9 10 11 10 11 10~~ 9

misterio			
	13	i	~~[1,2,3] [2,1,3] [2,3,1] [1,3,2] [3,1,2]~~ [3,2,1]
	2	m	~~[2,3]~~ [3,2]
	1	ls	[1, 2, 3]
	0	pc	~~8 9 10 11 10 11 10 11 10 9 10 11 10 11 10 11 10~~ 9

GLOBAL	
ins	proc
m	~~[1,2,3] [2,1,3] [2,3,1] [1,3,2] [3,1,2]~~ [3,2,1]
pc	~~15 16 15 16 15 16 15 16 15 16 15 16~~ 15

Imprime:
[1,2,3]
[2,1,3]
[2,3,1]
[1,3,2]
[3,1,2]
[3,2,1]

```
 1  > def ins(e, ls): ⋯
 6
 7    def misterio(ls):
 8        if ls:
 9            for m in misterio(ls[1:]):
10                for i in ins(ls[0], m):
11                    yield i
12        else:
13            yield []
14
15    for m in misterio([1,2,3]):
16        print (m)
```

misterio	10	ls	[]
	9	pc	8 ~~13~~

misterio	11	i	[3]
	8	m	~~[]~~
	7	ls	[3]
	6	pc	~~8~~ ~~9~~ ~~10~~ ~~11~~ ~~10~~ 9

misterio	12	i	~~[2,3]~~ [3,2]
	5	m	~~[3]~~
	4	ls	[2, 3]
	3	pc	~~8~~ ~~9~~ ~~10~~ ~~11~~ ~~10~~ ~~11~~ ~~10~~ 9

misterio	13	i	~~[1,2,3]~~ ~~[2,1,3]~~ ~~[2,3,1]~~ ~~[1,3,2]~~ ~~[3,1,2]~~ [3,2,1]
	2	m	~~[2,3]~~ [3,2]
	1	ls	[1, 2, 3]
	0	pc	~~8~~ ~~9~~ ~~10~~ ~~11~~ ~~10~~ ~~11~~ ~~10~~ ~~11~~ ~~10~~ ~~9~~ ~~10~~ ~~11~~ ~~10~~ ~~11~~ ~~10~~ ~~11~~ ~~10~~ 9

GLOBAL	
ins	proc
m	~~[1,2,3]~~ ~~[2,1,3]~~ ~~[2,3,1]~~ ~~[1,3,2]~~ ~~[3,1,2]~~ [3,2,1]
pc	~~15~~ ~~16~~ ~~15~~ ~~16~~ ~~15~~ ~~16~~ ~~15~~ ~~16~~ ~~15~~ ~~16~~ ~~15~~ ~~16~~ 15

Imprime:
[1,2,3]
[2,1,3]
[2,3,1]
[1,3,2]
[3,1,2]
[3,2,1]

```python
1  > def ins(e, ls): …
6
7    def misterio(ls):
8        if ls:
9            for m in misterio(ls[1:]):
10               for i in ins(ls[0], m):
11                   yield i
12       else:
13           yield []
14
15   for m in misterio([1,2,3]):
16       print (m)
```

GLOBAL	
ins	proc
m	[1,2,3] [2,1,3] [2,3,1] [1,3,2] [3,1,2] [3,2,1]
pc	15 16 15 16 15 16 15 16 15 16 15 16 15

misterio

10	ls	[]
9	pc	8 13

misterio

11	i	[3]
8	m	[]
7	ls	[3]
6	pc	8 9 10 11 10 9

misterio

12	i	[2,3] [3,2]
5	m	[3]
4	ls	[2, 3]
3	pc	8 9 10 11 10 11 10 9

misterio

13	i	[1,2,3] [2,1,3] [2,3,1] [1,3,2] [3,1,2] [3,2,1]
2	m	[2,3] [3,2]
1	ls	[1, 2, 3]
0	pc	8 9 10 11 10 11 10 11 10 9 10 11 10 11 10 11 10 9

Imprime:
[1,2,3]
[2,1,3]
[2,3,1]
[1,3,2]
[3,1,2]
[3,2,1]

```
1  > def ins(e, ls): …
6
7    def misterio(ls):
8        if ls:
9            for m in misterio(ls[1:]):
10               for i in ins(ls[0], m):
11                   yield i
12           else:
13               yield []
14
15   for m in misterio([1,2,3]):
16       print (m)
```

| misterio | 10 | ls | [] |
| | 9 | pc | 8 ~~13~~ |

misterio	11	i	[3]
	8	m	~~[]~~
	7	ls	[3]
	6	pc	~~8~~ ~~9~~ ~~10~~ ~~11~~ ~~10~~ 9

misterio	12	i	~~[2,3]~~ [3,2]
	5	m	~~[3]~~
	4	ls	[2, 3]
	3	pc	~~8~~ ~~9~~ ~~10~~ ~~11~~ ~~10~~ ~~11~~ ~~10~~ 9

misterio	13	i	~~[1,2,3]~~ ~~[2,1,3]~~ ~~[2,3,1]~~ ~~[1,3,2]~~ ~~[3,1,2]~~ [3,2,1]
	2	m	~~[2,3]~~ ~~[3,2]~~
	1	ls	[1, 2, 3]
	0	pc	~~8~~ ~~9~~ ~~10~~ ~~11~~ ~~10~~ ~~11~~ ~~10~~ ~~11~~ ~~10~~ ~~9~~ ~~10~~ ~~11~~ ~~10~~ ~~11~~ ~~10~~ ~~11~~ ~~10~~ 9

GLOBAL	
ins	proc
m	~~[1,2,3]~~ ~~[2,1,3]~~ ~~[2,3,1]~~ ~~[1,3,2]~~ ~~[3,1,2]~~ [3,2,1]
pc	~~15~~ ~~16~~ ~~15~~ ~~16~~ ~~15~~ ~~16~~ ~~15~~ ~~16~~ ~~15~~ ~~16~~ ~~15~~ ~~16~~ 15

Imprime:
[1,2,3]
[2,1,3]
[2,3,1]
[1,3,2]
[3,1,2]
[3,2,1]

```python
1  > def ins(e, ls): …
6
7    def misterio(ls):
8        if ls:
9            for m in misterio(ls[1:]):
10               for i in ins(ls[0], m):
11                   yield i
12       else:
13           yield []
14
15   for m in misterio([1,2,3]):
16       print (m)
```

	10	ls	[]
misterio	9	pc	~~8 13~~

	11	i	[3]
misterio	8	m	~~[]~~
	7	ls	[3]
	6	pc	~~8 9 10 11 10 9~~

	12	i	~~[2,3]~~ [3,2]
misterio	5	m	~~[3]~~
	4	ls	[2, 3]
	3	pc	~~8 9 10 11 10 11 10 9~~

	13	i	~~[1,2,3] [2,1,3] [2,3,1] [1,3,2] [3,1,2]~~ [3,2,1]
misterio	2	m	~~[2,3] [3,2]~~
	1	ls	[1, 2, 3]
	0	pc	~~8 9 10 11 10 11 10 11 10 9 10 11 10 11 10 11 10 9~~

GLOBAL	
ins	proc
m	~~[1,2,3] [2,1,3] [2,3,1] [1,3,2] [3,1,2] [3,2,1]~~
pc	~~15 16 15 16 15 16 15 16 15 16 15 16 15~~

Respuesta 3.b.ii:

El iterador misterio se apoya en el iterador ins para obtener todas las permutaciones de los elementos de un arreglo. Para este ejemplo es aprovechado el uso del iterador ins de manera que no se repita alguna permutación, para ello ins es llamado en una ocasión de esta manera: for i in ins(1, [2,3]) y también for i in ins(1, [3,2]), así para la primera retorna [1,2,3], [2,1,3], [2,3,1] y para la segunda retorna [1.3.2], [3,1,2], [3,2,1] siendo estas seis todas las permutaciones de [1,2,3].

Respuesta 3.b.iii:

En el repositorio.

Respuesta 4:   -Código en el repositorio

                       -Análisis y Conclusiones:

#-------------------- Comparando solo Recursion, Recursion de Cola e Iterativo ------------------------#
En el gráfico los tiempos de Recursión de cola es solapado por el iterativo pero sí está presente.

Ingrese el número final de n: 200
Ingrese el número pasos desde 0 hasta 200: 10

Resultados de la ejecución:

n	Recursiva	Recursiva Cola	Iterativo
0	0	0	0
10	10	10	10
20	20	20	20
30	30	30	30
40	40	40	40
50	154	154	154
60	346	346	346
70	1148	1148	1148
80	2566	2566	2566
90	5680	5680	5680
100	19514	19514	19514
110	43460	43460	43460
120	148124	148124	148124
130	331342	331342	331342
140	1122744	1122744	1122744
150	2523330	2523330	2523330
160	5597772	5597772	5597772
170	19188500	19188500	19188500
180	42739078	42739078	42739078
190	145691680	145691680	145691680
200	325909066	325909066	325909066

Tiempos de ejecución en segundos:

n	Recursiva	Recursiva Cola	Iterativo
0	0.00002	0.00001	0.00003
10	0.00000	0.00000	0.00001
20	0.00000	0.00000	0.00008
30	0.00000	0.00000	0.00001
40	0.00000	0.00000	0.00001
50	0.00001	0.00001	0.00001
60	0.00001	0.00003	0.00003
70	0.00003	0.00005	0.00004
80	0.00005	0.00007	0.00006
90	0.00011	0.00009	0.00007
100	0.00043	0.00011	0.00009
110	0.00083	0.00013	0.00011
120	0.00323	0.00012	0.00007
130	0.00383	0.00012	0.00008
140	0.01447	0.00013	0.00007
150	0.03274	0.00028	0.00025
160	0.10345	0.00034	0.00019
170	0.40174	0.00032	0.00020
180	0.72108	0.00018	0.00011
190	2.93552	0.00039	0.00023
200	5.62845	0.00040	0.00025

Tiempos de resultados de la ejecucion
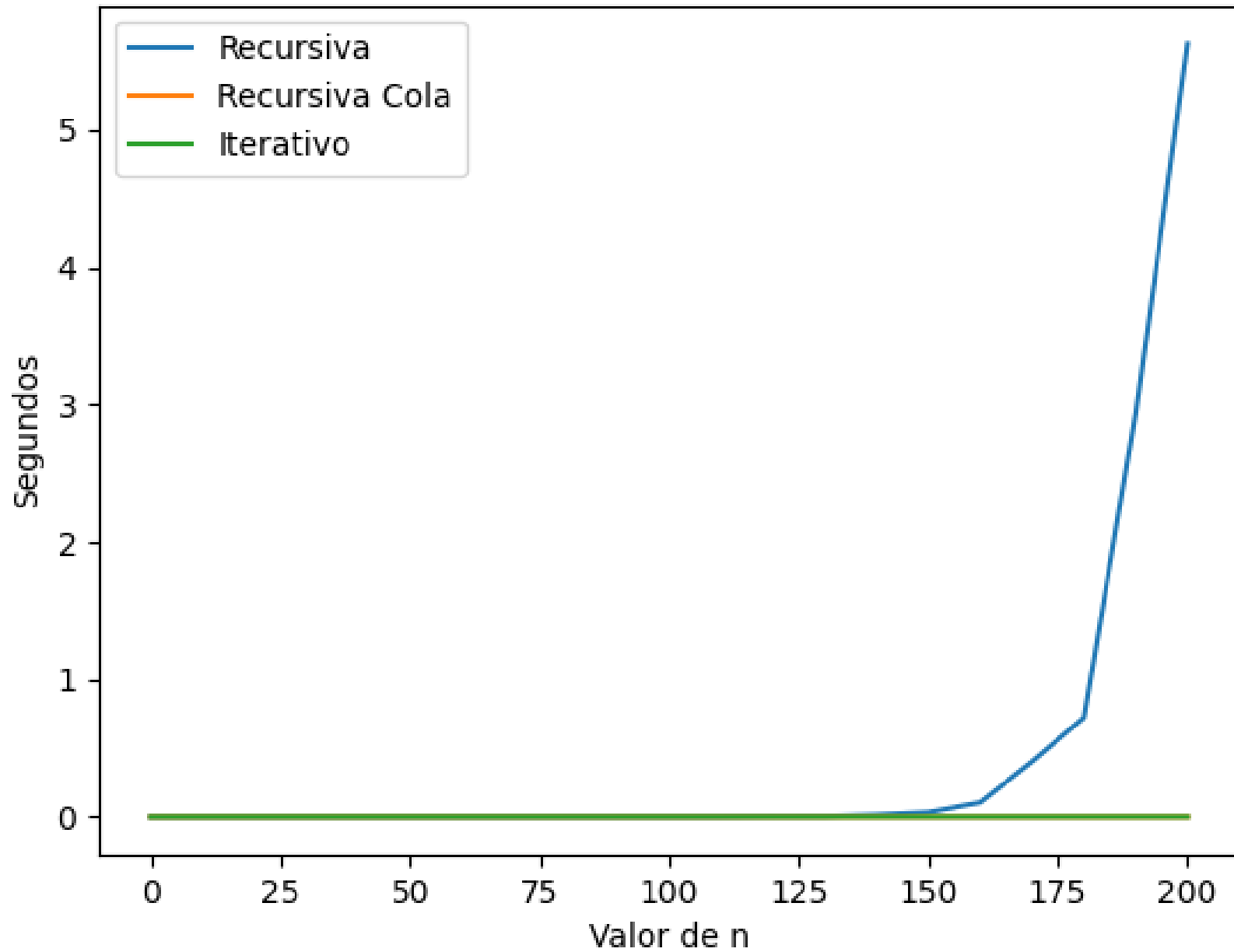
#-------------------- Comparando solo Recursión de Cola e Iterativo ------------------------#

Ingrese el número final de n: 1000
Ingrese el número pasos desde 0 hasta 1000: 50

Resultados de la ejecución:
----

n	Recursiva Cola	Iterativo
0	0	0
50	154	154
100	19514	19514
150	2523330	2523330
200	325909066	325909066
250	42037847602	42037847602
300	5415584562874	5415584562874
350	1068386405025058	1068386405025058
400	138637461825357962	138637461825357962
450	17959827819432288658	17959827819432288658
500	2323001711287687045912	2323001711287687045912
550	300035639593403025126572	300035639593403025126572
600	38700527148897239439488308	38700527148897239439488308
650	4985649584176171018301957948	4985649584176171018301957948
700	9835688417590451064207137111812	9835688417590451064207137111812
750	127631245690348296968421676977228	127631245690348296968421676977228
800	1653402454717362384037485702318588	1653402454717362384037485702318588
850	21385821570070625777358737324010270620	21385821570070625777358737324010270620
900	2762162688829761378707174699746452074600...	2762162688829761378707174699746452074600...
950	3562815146680246518615645657484740205915...	3562815146680246518615645657484740205915...
1000	4589846486121852471287507026774008357772574	4589846486121852471287507026774008357772574

Tiempos de ejecución en segundos:

n	Recursiva Cola	Iterativo
0	0.00001	0.00003
50	0.00001	0.00002
100	0.00013	0.00009
150	0.00027	0.00017
200	0.00042	0.00027
250	0.00057	0.00034
300	0.00067	0.00046
350	0.00061	0.00038
400	0.00071	0.00046
450	0.00079	0.00053
500	0.00091	0.00060
550	0.00111	0.00069
600	0.00112	0.00076
650	0.00137	0.00087
700	0.00140	0.00065
750	0.00094	0.00096
800	0.00171	0.00105
850	0.00154	0.00121
900	0.00171	0.00121
950	0.00213	0.00145
1000	0.00300	0.00197

Tiempos de resultados de la ejecucion
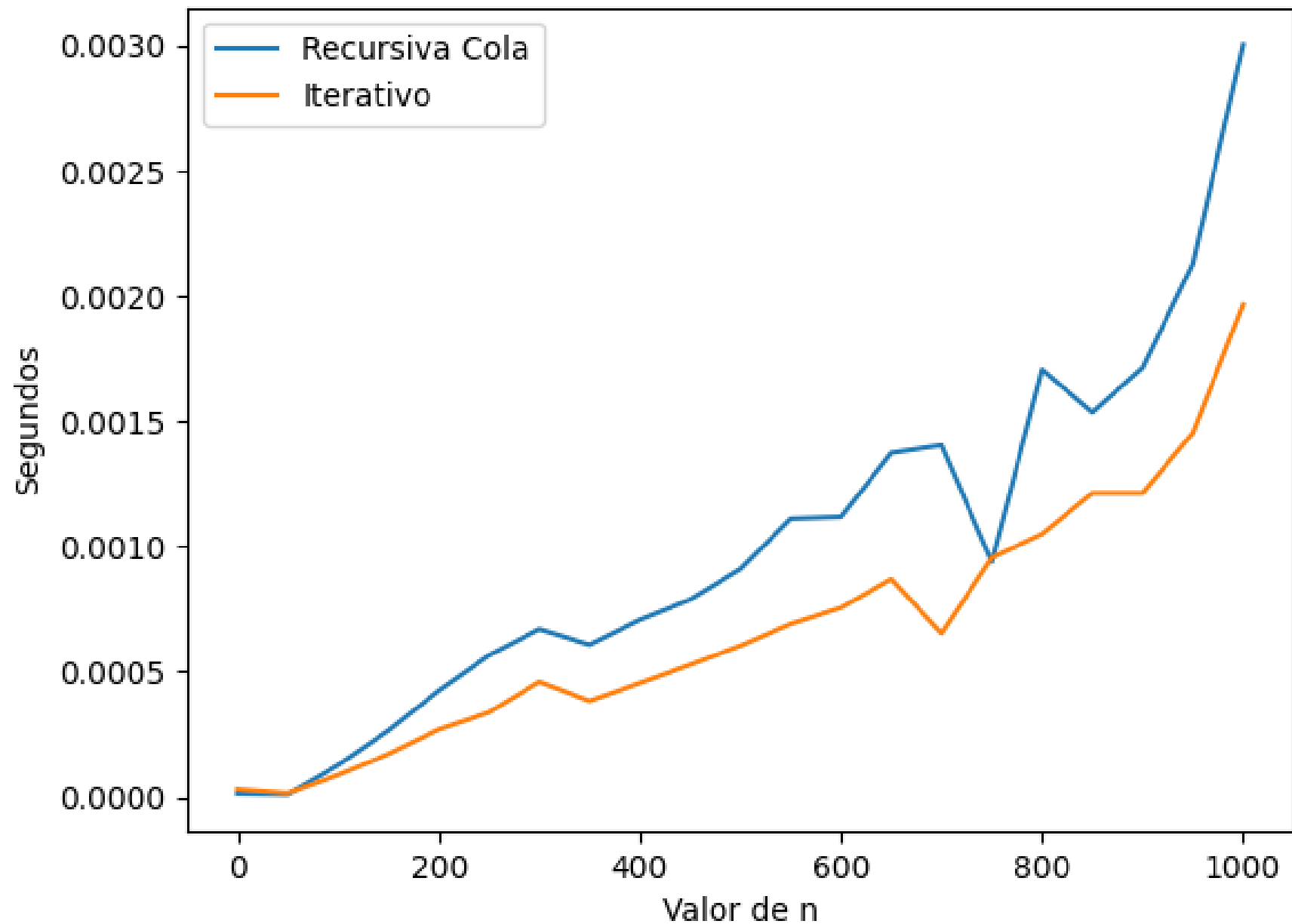
#-------------------- Iterativo ------------------------#

Ingrese el número final de n: 2000
Ingrese el número pasos desde 0 hasta 2000: 100

Resultados de la ejecución:
----
n | Iterativo
----
0 | 0
100 | 19514
200 | 325909066
300 | 5415584562874
400 | 138637461825357962
500 | 23230017112876870459122
600 | 3870052714889723943948308
700 | 983568841759045106420713711812
800 | 165340245471736238403748570231 89588
900 | 27621626888297613787071746997464520 7460
1000 | 4589846486121852471287507026774008357772574
1100 | 11749879622717184430923926108289502266 7020423470
1200 | 1968803389186389292091184313078620737095 540969734910
1300 | 3279968699283179797117092858146785521665 3213865167255854
1400 | 8335997600621326337964205832062169355934 02997634964894880982
1500 | 14013008861419226477455039174797696011796 10718250857502 8208474520
1600 | 23410035545078200752153641690576336517216 36999625344833 11757405155752
1700 | 38900123378543979996259242370159770238559 2212951284705782717745288783032
1800 | 99583236255622392587642323890918324981994 11634510885436489141 2082505180716360
1900 | 16686112482987212143817272305550039443597 71927215719314536523621923889398632826766
2000 | 27798573975169917358859554998268731428692 56092853504238585147246918844002513594411538

Tiempos de ejecución en segundos:

----

n	Iterativo
0	0.00004
100	0.00005
200	0.00015
300	0.00020
400	0.00029
500	0.00040
600	0.00048
700	0.00058
800	0.00066
900	0.00076
1000	0.00084
1100	0.00094
1200	0.00120
1300	0.00115
1400	0.00123
1500	0.00131
1600	0.00202
1700	0.00206
1800	0.00161
1900	0.00172

Tiempos de resultados de la ejecucion
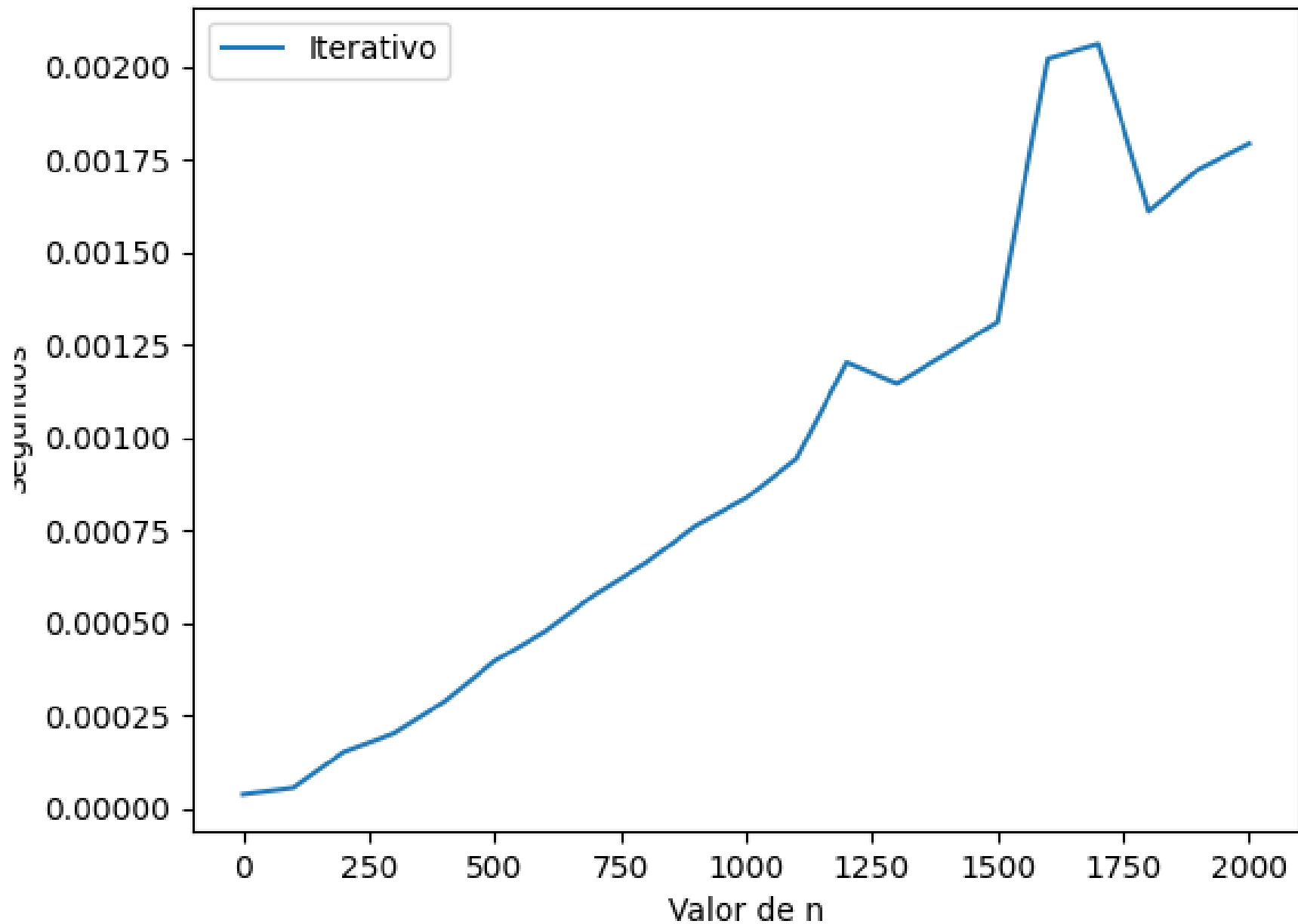
#-------------------- Conclusiones ------------------------#

La implementación Recursiva es menos eficiente. Se probó con un valor de n = 300 y no hubo respuesta transcurridos 10 minutos. A su vez, se observa en los resultados y en el gráfico, que es la menos eficiente en tiempo ya que para el valor de n = 200 obtuvo un tiempo de 5.62845 segundos, es un *14071.125 en el tiempo de la recursión de cola (0.00040 segundos) y *22513.8 el tiempo de la iterativa (0.00025 segundos).

La implementación Recursiva de cola con un valor de n mayor que 1000 arroja el error: RecursionError: maximum recursion depth exceeded in comparison. Se debe a que se excedió el nivel de recursividad y por ende no se puede comprar con valores de n superiores a 1000.

Por los resultados obtenidos en la comparación con la implementación Iterativa se puede observar que la implementación Recursiva de cola es menos eficiente pero solo por muy poco. Para n = 500 se observa que el tiempo de la Recursión de Cola es de 0.00091 segundos y el tiempo de la Iterativa es de 0.00060 segundos. La diferencia entre los tiempos es de 0.00030 segundos, siendo el tiempo de la Recursión de Cola un *1.51667 de el tiempo de la Iterativa. Para n = 1000 se observa que el tiempo de la Recursión de Cola es de 0.00300 segundos y el tiempo de la Iterativa es de 0.00197 segundos. La diferencia entre los tiempos es de 0.00103 segundos, siendo el tiempo de la Recursión de Cola un *1.52284 de el tiempo de la Iterativa.

Finalmente se observa que la implementación Iterativa en la más eficiente en tiempo alcanzando un tiempo de 0.00179 segundos para n = 2000. Y sin tener limitante para el valor de n.

Respuesta 6.a y 6.b: Con   A = 11 , B = 11, C = 5
Línea: 2

```
1   coroutine w():              1   coroutine t():              1   coroutine f():
2       int a = 0               2       int b = 1               2       int c = 1
3       loop:                   3       loop:                   3       loop:
4           a = a + 11          4           b = (b + 1) * 11    4           c = 2 * (c + 5)
5           print(a)            5           print(b)            5           print(c)
6           if a mod 3 == 0:    6           if b mod 3 == 1:    6           if c mod 3 == 2:
7               transfer t()    7               transfer w()    7               transfer w()
8           else:               8           else:               8           else:
9               transfer f()    9               transfer f()    9               transfer t()
```

Imprime:

f	1	c	
	0	pc	

t	1	b	
	0	pc	

w	1	a	-
	0	pc	2

Línea: 4

```
1   coroutine w():              1   coroutine t():              1   coroutine f():
2       int a = 0               2       int b = 1               2       int c = 1
3       loop:                   3       loop:                   3       loop:
4           a = a + 11          4           b = (b + 1) * 11    4           c = 2 * (c + 5)
5           print(a)            5           print(b)            5           print(c)
6           if a mod 3 == 0:    6           if b mod 3 == 1:    6           if c mod 3 == 2:
7               transfer t()    7               transfer w()    7               transfer w()
8           else:               8           else:               8           else:
9               transfer f()    9               transfer f()    9               transfer t()
```

Imprime:

f	1	c	
	0	pc	

t	1	b	
	0	pc	

w	1	a	0
	0	pc	~~2~~ 4

Línea: 5

```
1   coroutine w():              1   coroutine t():              1   coroutine f():
2       int a = 0               2       int b = 1               2       int c = 1
3       loop:                   3       loop:                   3       loop:
4           a = a + 11          4           b = (b + 1) * 11    4           c = 2 * (c + 5)
5           print(a)            5           print(b)            5           print(c)
6           if a mod 3 == 0:    6           if b mod 3 == 1:    6           if c mod 3 == 2:
7               transfer t()    7               transfer w()    7               transfer w()
8           else:               8           else:               8           else:
9               transfer f()    9               transfer f()    9               transfer t()
```

Imprime:

f	1	c	
	0	pc	

t	1	b	
	0	pc	

w	1	a	~~0~~ 11
	0	pc	~~2~~ ~~4~~ 5

Línea: 6

```
1    coroutine w():
2        int a = 0
3        loop:
4            a = a + 11
5            print(a)
6            if a mod 3 == 0:
7                transfer t()
8            else:
9                transfer f()
```

```
1    coroutine t():
2        int b = 1
3        loop:
4            b = (b + 1) * 11
5            print(b)
6            if b mod 3 == 1:
7                transfer w()
8            else:
9                transfer f()
```

```
1    coroutine f():
2        int c = 1
3        loop:
4            c = 2 * (c + 5)
5            print(c)
6            if c mod 3 == 2:
7                transfer w()
8            else:
9                transfer t()
```

Imprime:
11

f	1	c	
	0	pc	

t	1	b	
	0	pc	

w	1	a	~~0~~ 11
	0	pc	~~2 4 5~~ 6

Línea: 9

```
1    coroutine w():          1    coroutine t():          1    coroutine f():
2        int a = 0           2        int b = 1           2        int c = 1
3        loop:               3        loop:               3        loop:
4            a = a + 11      4            b = (b + 1) * 11 4            c = 2 * (c + 5)
5            print(a)        5            print(b)        5            print(c)
6            if a mod 3 == 0:6            if b mod 3 == 1:6            if c mod 3 == 2:
7                transfer t()7                transfer w()7                transfer w()
8            else:           8            else:           8            else:
9                transfer f()9                transfer f()9                transfer t()
```

Imprime:
11

f	1	c	
	0	pc	

t	1	b	
	0	pc	

w	1	a	~~0~~ 11
	0	pc	~~2 4 5 6~~ 9

Línea: **2**

```
1    coroutine w():              1    coroutine t():              1    coroutine f():
2        int a = 0               2        int b = 1               2        int c = 1
3        loop:                   3        loop:                   3        loop:
4            a = a + 11          4            b = (b + 1) * 11    4            c = 2 * (c + 5)
5            print(a)            5            print(b)            5            print(c)
6            if a mod 3 == 0:    6            if b mod 3 == 1:    6            if c mod 3 == 2:
7                transfer t()    7                transfer w()    7                transfer w()
8            else:               8            else:               8            else:
9                transfer f()    9                transfer f()    9                transfer t()
```

Imprime:
11

f	1	c	-
	0	pc	2

t	1	b	
	0	pc	

w	1	a	~~0~~ 11
	0	pc	~~2 4 5 6~~ 9

Línea: **4**

```
1    coroutine w():          1    coroutine t():          1    coroutine f():
2        int a = 0           2        int b = 1           2        int c = 1
3        loop:               3        loop:               3        loop:
4            a = a + 11      4            b = (b + 1) * 11 4            c = 2 * (c + 5)
5            print(a)        5            print(b)        5            print(c)
6            if a mod 3 == 0: 6            if b mod 3 == 1: 6            if c mod 3 == 2:
7                transfer t() 7                transfer w() 7                transfer w()
8            else:           8            else:           8            else:
9                transfer f() 9                transfer f() 9                transfer t()
```

Imprime:
11

f	1	c	1
	0	pc	~~2~~ 4

t	1	b	
	0	pc	

w	1	a	~~0~~ 11
	0	pc	~~2 4 5 6~~ 9

Línea: **5**

```
1    coroutine w():
2        int a = 0
3        loop:
4            a = a + 11
5            print(a)
6            if a mod 3 == 0:
7                transfer t()
8            else:
9                transfer f()
```

```
1    coroutine t():
2        int b = 1
3        loop:
4            b = (b + 1) * 11
5            print(b)
6            if b mod 3 == 1:
7                transfer w()
8            else:
9                transfer f()
```

```
1    coroutine f():
2        int c = 1
3        loop:
4            c = 2 * (c + 5)
5            print(c)
6            if c mod 3 == 2:
7                transfer w()
8            else:
9                transfer t()
```

Imprime:
11

f	1	c	~~1~~ 12
	0	pc	~~2~~ ~~4~~ 5

t	1	b	
	0	pc	

w	1	a	~~0~~ 11
	0	pc	~~2~~ ~~4~~ ~~5~~ ~~6~~ 9

Línea: **6**

```
1    coroutine w():
2        int a = 0
3        loop:
4            a = a + 11
5            print(a)
6            if a mod 3 == 0:
7                transfer t()
8            else:
9                transfer f()
```

```
1    coroutine t():
2        int b = 1
3        loop:
4            b = (b + 1) * 11
5            print(b)
6            if b mod 3 == 1:
7                transfer w()
8            else:
9                transfer f()
```

```
1    coroutine f():
2        int c = 1
3        loop:
4            c = 2 * (c + 5)
5            print(c)
6            if c mod 3 == 2:
7                transfer w()
8            else:
9                transfer t()
```

Imprime:
11
12

f	1	c	~~1~~ 12
	0	pc	~~2 4 5~~ 6

t	1	b	
	0	pc	

w	1	a	~~0~~ 11
	0	pc	~~2 4 5 6~~ 9

Línea: **9**

```
1    coroutine w():                    1    coroutine t():                    1    coroutine f():
2        int a = 0                      2        int b = 1                      2        int c = 1
3        loop:                          3        loop:                          3        loop:
4            a = a + 11                 4            b = (b + 1) * 11           4            c = 2 * (c + 5)
5            print(a)                   5            print(b)                   5            print(c)
6            if a mod 3 == 0:           6            if b mod 3 == 1:           6            if c mod 3 == 2:
7                transfer t()           7                transfer w()           7                transfer w()
8            else:                      8            else:                      8            else:
9                transfer f()           9                transfer f()           9                transfer t()
```

Imprime:
11
12

f	1	c	~~1~~ 12
	0	pc	~~2 4 5 6~~ 9

t	1	b	
	0	pc	

w	1	a	~~0~~ 11
	0	pc	~~2 4 5 6~~ 9

```
1    coroutine w():              1    coroutine t():              1    coroutine f():
2        int a = 0               2        int b = 1               2        int c = 1
3        loop:                   3        loop:                   3        loop:
4            a = a + 11          4            b = (b + 1) * 11    4            c = 2 * (c + 5)
5            print(a)            5            print(b)            5            print(c)
6            if a mod 3 == 0:    6            if b mod 3 == 1:    6            if c mod 3 == 2:
7                transfer t()    7                transfer w()    7                transfer w()
8            else:               8            else:               8            else:
9                transfer f()    9                transfer f()    9                transfer t()
```

Imprime:
11
12

f	**1**	c	~~1~~ 12
	0	pc	~~2 4 5 6~~ 9

t	**1**	b	-
	0	pc	2

w	**1**	a	~~0~~ 11
	0	pc	~~2 4 5 6~~ 9

Línea: **4**

```
1   coroutine w():              1   coroutine t():              1   coroutine f():
2       int a = 0               2       int b = 1               2       int c = 1
3       loop:                   3       loop:                   3       loop:
4           a = a + 11          4           b = (b + 1) * 11    4           c = 2 * (c + 5)
5           print(a)            5           print(b)            5           print(c)
6           if a mod 3 == 0:    6           if b mod 3 == 1:    6           if c mod 3 == 2:
7               transfer t()    7               transfer w()    7               transfer w()
8           else:               8           else:               8           else:
9               transfer f()    9               transfer f()    9               transfer t()
```

Imprime:
11
12

f	1	c	1 12
	0	pc	2 4 5 6 9

t	1	b	1
	0	pc	2 4

w	1	a	0 11
	0	pc	2 4 5 6 9

```
1    coroutine w():              1    coroutine t():              1    coroutine f():
2        int a = 0               2        int b = 1               2        int c = 1
3        loop:                   3        loop:                   3        loop:
4            a = a + 11          4            b = (b + 1) * 11    4            c = 2 * (c + 5)
5            print(a)            5            print(b)            5            print(c)
6            if a mod 3 == 0:    6            if b mod 3 == 1:    6            if c mod 3 == 2:
7                transfer t()    7                transfer w()    7                transfer w()
8            else:               8            else:               8            else:
9                transfer f()    9                transfer f()    9                transfer t()
```

Imprime:
11
12

f	1	c	~~1~~ 12
	0	pc	~~2 4 5 6~~ 9

t	1	b	~~1~~ 22
	0	pc	~~2 4~~ 5

w	1	a	~~0~~ 11
	0	pc	~~2 4 5 6~~ 9

Línea: **6**

```
1    coroutine w():          1    coroutine t():          1    coroutine f():
2        int a = 0           2        int b = 1           2        int c = 1
3        loop:               3        loop:               3        loop:
4            a = a + 11      4            b = (b + 1) * 11 4            c = 2 * (c + 5)
5            print(a)        5            print(b)        5            print(c)
6            if a mod 3 == 0:6            if b mod 3 == 1:6            if c mod 3 == 2:
7                transfer t()7                transfer w()7                transfer w()
8            else:           8            else:           8            else:
9                transfer f()9                transfer f()9                transfer t()
```

Imprime:
11
12
22

f	1	c	~~1~~ 12
	0	pc	~~2 4 5 6~~ 9

t	1	b	~~1~~ 22
	0	pc	~~2 4 5~~ 6

w	1	a	~~0~~ 11
	0	pc	~~2 4 5 6~~ 9

```
1    coroutine w():              1    coroutine t():              1    coroutine f():
2        int a = 0               2        int b = 1               2        int c = 1
3        loop:                   3        loop:                   3        loop:
4            a = a + 11          4            b = (b + 1) * 11    4            c = 2 * (c + 5)
5            print(a)            5            print(b)            5            print(c)
6            if a mod 3 == 0:    6            if b mod 3 == 1:    6            if c mod 3 == 2:
7                transfer t()    7                transfer w()    7                transfer w()
8            else:               8            else:               8            else:
9                transfer f()    9                transfer f()    9                transfer t()
```

Imprime:
11
12
22

f	1	c	~~1~~ 12
	0	pc	~~2 4 5 6~~ 9

t	1	b	~~1~~ 22
	0	pc	~~2 4 5 6~~ 7

w	1	a	~~0~~ 11
	0	pc	~~2 4 5 6~~ 9

Línea: 4

```
1    coroutine w():              1    coroutine t():              1    coroutine f():
2        int a = 0               2        int b = 1               2        int c = 1
3        loop:                   3        loop:                   3        loop:
4            a = a + 11          4            b = (b + 1) * 11    4            c = 2 * (c + 5)
5            print(a)            5            print(b)            5            print(c)
6            if a mod 3 == 0:    6            if b mod 3 == 1:    6            if c mod 3 == 2:
7                transfer t()    7                transfer w()    7                transfer w()
8            else:               8            else:               8            else:
9                transfer f()    9                transfer f()    9                transfer t()
```

Imprime:
11
12
22

f	**1**	**c**	~~1~~ 12
	0	**pc**	~~2 4 5 6~~ 9

t	**1**	**b**	~~1~~ 22
	0	**pc**	~~2 4 5 6~~ 7

w	**1**	**a**	~~0~~ 11
	0	**pc**	~~2 4 5 6 9~~ 4

Línea: 5

```
1    coroutine w():
2        int a = 0
3        loop:
4            a = a + 11
5            print(a)
6            if a mod 3 == 0:
7                transfer t()
8            else:
9                transfer f()
```

```
1    coroutine t():
2        int b = 1
3        loop:
4            b = (b + 1) * 11
5            print(b)
6            if b mod 3 == 1:
7                transfer w()
8            else:
9                transfer f()
```

```
1    coroutine f():
2        int c = 1
3        loop:
4            c = 2 * (c + 5)
5            print(c)
6            if c mod 3 == 2:
7                transfer w()
8            else:
9                transfer t()
```

Imprime:
11
12
22

f	1	c	~~1~~ 12
	0	pc	~~2 4 5 6~~ 9

t	1	b	~~1~~ 22
	0	pc	~~2 4 5 6~~ 7

w	1	a	~~0 11~~ 22
	0	pc	~~2 4 5 6 9 4~~ 5

Línea: 6

```
1    coroutine w():              1    coroutine t():              1    coroutine f():
2        int a = 0               2        int b = 1               2        int c = 1
3        loop:                   3        loop:                   3        loop:
4            a = a + 11          4            b = (b + 1) * 11    4            c = 2 * (c + 5)
5            print(a)            5            print(b)            5            print(c)
6            if a mod 3 == 0:    6            if b mod 3 == 1:    6            if c mod 3 == 2:
7                transfer t()    7                transfer w()    7                transfer w()
8            else:               8            else:               8            else:
9                transfer f()    9                transfer f()    9                transfer t()
```

Imprime:
11
12
22
22

f	1	c	~~1~~ 12
	0	pc	~~2 4 5 6~~ 9

t	1	b	~~1~~ 22
	0	pc	~~2 4 5 6~~ 7

w	1	a	~~0 11~~ 22
	0	pc	~~2 4 5 6 9 4 5~~ 6

Línea: 9

```
1    coroutine w():
2        int a = 0
3        loop:
4            a = a + 11
5            print(a)
6            if a mod 3 == 0:
7                transfer t()
8            else:
9                transfer f()
```

```
1    coroutine t():
2        int b = 1
3        loop:
4            b = (b + 1) * 11
5            print(b)
6            if b mod 3 == 1:
7                transfer w()
8            else:
9                transfer f()
```

```
1    coroutine f():
2        int c = 1
3        loop:
4            c = 2 * (c + 5)
5            print(c)
6            if c mod 3 == 2:
7                transfer w()
8            else:
9                transfer t()
```

Imprime:
11
12
22
22

f	1	c	~~1~~ 12
	0	pc	~~2 4 5 6~~ 9

t	1	b	~~1~~ 22
	0	pc	~~2 4 5 6~~ 7

w	1	a	~~0 11~~ 22
	0	pc	~~2 4 5 6 9 4 5 6~~ 9

Línea: **4**

```
1    coroutine w():
2        int a = 0
3        loop:
4            a = a + 11
5            print(a)
6            if a mod 3 == 0:
7                transfer t()
8            else:
9                transfer f()
```

```
1    coroutine t():
2        int b = 1
3        loop:
4            b = (b + 1) * 11
5            print(b)
6            if b mod 3 == 1:
7                transfer w()
8            else:
9                transfer f()
```

```
1    coroutine f():
2        int c = 1
3        loop:
4            c = 2 * (c + 5)
5            print(c)
6            if c mod 3 == 2:
7                transfer w()
8            else:
9                transfer t()
```

Imprime:
11
12
22
22

f	1	c	~~1~~ 12
	0	pc	~~2 4 5 6 9~~ 4

t	1	b	~~1~~ 22
	0	pc	~~2 4 5 6~~ 7

w	1	a	~~0 11~~ 22
	0	pc	~~2 4 5 6 9 4 5 6~~ 9

Línea: **5**

```
1    coroutine w():
2        int a = 0
3        loop:
4            a = a + 11
5            print(a)
6            if a mod 3 == 0:
7                transfer t()
8            else:
9                transfer f()
```

```
1    coroutine t():
2        int b = 1
3        loop:
4            b = (b + 1) * 11
5            print(b)
6            if b mod 3 == 1:
7                transfer w()
8            else:
9                transfer f()
```

```
1    coroutine f():
2        int c = 1
3        loop:
4            c = 2 * (c + 5)
5            print(c)
6            if c mod 3 == 2:
7                transfer w()
8            else:
9                transfer t()
```

Imprime:
11
12
22
22

f	1	c	~~1 12~~ 34
	0	pc	~~2 4 5 6 9 4~~ 5

t	1	b	~~1~~ 22
	0	pc	~~2 4 5 6~~ 7

w	1	a	~~0 11~~ 22
	0	pc	~~2 4 5 6 9 4 5 6~~ 9

```
1    coroutine w():          1    coroutine t():          1    coroutine f():
2        int a = 0           2        int b = 1           2        int c = 1
3        loop:               3        loop:               3        loop:
4            a = a + 11      4            b = (b + 1) * 11 4            c = 2 * (c + 5)
5            print(a)        5            print(b)        5            print(c)
6            if a mod 3 == 0:6            if b mod 3 == 1:6            if c mod 3 == 2:
7                transfer t()7                transfer w()7                transfer w()
8            else:           8            else:           8            else:
9                transfer f()9                transfer f()9                transfer t()
```

Imprime:
11
12
22
22
34

f	1	c	~~1~~ ~~12~~ 34
	0	pc	~~2~~ ~~4~~ ~~5~~ ~~6~~ ~~9~~ ~~4~~ ~~5~~ 6

t	1	b	~~1~~ 22
	0	pc	~~2~~ ~~4~~ ~~5~~ ~~6~~ 7

w	1	a	~~0~~ ~~11~~ 22
	0	pc	~~2~~ ~~4~~ ~~5~~ ~~6~~ ~~9~~ ~~4~~ ~~5~~ ~~6~~ 9

```
1    coroutine w():
2        int a = 0
3        loop:
4            a = a + 11
5            print(a)
6            if a mod 3 == 0:
7                transfer t()
8            else:
9                transfer f()
```

```
1    coroutine t():
2        int b = 1
3        loop:
4            b = (b + 1) * 11
5            print(b)
6            if b mod 3 == 1:
7                transfer w()
8            else:
9                transfer f()
```

```
1    coroutine f():
2        int c = 1
3        loop:
4            c = 2 * (c + 5)
5            print(c)
6            if c mod 3 == 2:
7                transfer w()
8            else:
9                transfer t()
```

Imprime:
11
12
22
22
34

f	1	c	~~1 12~~ 34
	0	pc	~~2 4 5 6 9 4 5 6~~ 9

t	1	b	~~1~~ 22
	0	pc	~~2 4 5 6~~ 7

w	1	a	~~0 11~~ 22
	0	pc	~~2 4 5 6 9 4 5 6~~ 9

Línea: 4

```
1    coroutine w():                    1    coroutine t():                    1    coroutine f():
2        int a = 0                     2        int b = 1                     2        int c = 1
3        loop:                         3        loop:                         3        loop:
4            a = a + 11                4            b = (b + 1) * 11          4            c = 2 * (c + 5)
5            print(a)                  5            print(b)                  5            print(c)
6            if a mod 3 == 0:          6            if b mod 3 == 1:          6            if c mod 3 == 2:
7                transfer t()          7                transfer w()          7                transfer w()
8            else:                     8            else:                     8            else:
9                transfer f()          9                transfer f()          9                transfer t()
```

Imprime:
11
12
22
22
34

f	1	c	1 12 34
	0	pc	2 4 5 6 9 4 5 6 9

t	1	b	1 22
	0	pc	2 4 5 6 7 4

w	1	a	0 11 22
	0	pc	2 4 5 6 9 4 5 6 9

Línea: **5**

```
1    coroutine w():              1    coroutine t():              1    coroutine f():
2        int a = 0               2        int b = 1               2        int c = 1
3        loop:                   3        loop:                   3        loop:
4            a = a + 11          4            b = (b + 1) * 11    4            c = 2 * (c + 5)
5            print(a)            5            print(b)            5            print(c)
6            if a mod 3 == 0:    6            if b mod 3 == 1:    6            if c mod 3 == 2:
7                transfer t()    7                transfer w()    7                transfer w()
8            else:               8            else:               8            else:
9                transfer f()    9                transfer f()    9                transfer t()
```

Imprime:
11
12
22
22
34

f	1	c	~~1 12~~ 34
	0	pc	~~2 4 5 6 9 4 5 6~~ 9

t	1	b	~~1 22~~ 253
	0	pc	~~2 4 5 6 7 4~~ 5

w	1	a	~~0 11~~ 22
	0	pc	~~2 4 5 6 9 4 5 6~~ 9

Línea: 6

```
1    coroutine w():
2        int a = 0
3        loop:
4            a = a + 11
5            print(a)
6            if a mod 3 == 0:
7                transfer t()
8            else:
9                transfer f()
```

```
1    coroutine t():
2        int b = 1
3        loop:
4            b = (b + 1) * 11
5            print(b)
6            if b mod 3 == 1:
7                transfer w()
8            else:
9                transfer f()
```

```
1    coroutine f():
2        int c = 1
3        loop:
4            c = 2 * (c + 5)
5            print(c)
6            if c mod 3 == 2:
7                transfer w()
8            else:
9                transfer t()
```

Imprime:
11
12
22
22
34
253

f	1	c	~~1~~ ~~12~~ 34
	0	pc	~~2~~ ~~4~~ ~~5~~ ~~6~~ ~~9~~ ~~4~~ ~~5~~ ~~6~~ 9

t	1	b	~~1~~ ~~22~~ 253
	0	pc	~~2~~ ~~4~~ ~~5~~ ~~6~~ ~~7~~ ~~4~~ ~~5~~ 6

w	1	a	~~0~~ ~~11~~ 22
	0	pc	~~2~~ ~~4~~ ~~5~~ ~~6~~ ~~9~~ ~~4~~ ~~5~~ ~~6~~ 9

```
1    coroutine w():
2        int a = 0
3        loop:
4            a = a + 11
5            print(a)
6            if a mod 3 == 0:
7                transfer t()
8            else:
9                transfer f()
```

```
1    coroutine t():
2        int b = 1
3        loop:
4            b = (b + 1) * 11
5            print(b)
6            if b mod 3 == 1:
7                transfer w()
8            else:
9                transfer f()
```

```
1    coroutine f():
2        int c = 1
3        loop:
4            c = 2 * (c + 5)
5            print(c)
6            if c mod 3 == 2:
7                transfer w()
8            else:
9                transfer t()
```

Imprime:
11
12
22
22
34
253

f	1	c	~~1~~ ~~12~~ 34
	0	pc	~~2~~ ~~4~~ ~~5~~ ~~6~~ ~~9~~ ~~4~~ ~~5~~ ~~6~~ 9

t	1	b	~~1~~ ~~22~~ 253
	0	pc	~~2~~ ~~4~~ ~~5~~ ~~6~~ ~~7~~ ~~4~~ ~~5~~ ~~6~~ 7

w	1	a	~~0~~ ~~11~~ 22
	0	pc	~~2~~ ~~4~~ ~~5~~ ~~6~~ ~~9~~ ~~4~~ ~~5~~ ~~6~~ 9

Línea: 4

```
1    coroutine w():              1    coroutine t():              1    coroutine f():
2        int a = 0               2        int b = 1               2        int c = 1
3        loop:                   3        loop:                   3        loop:
4            a = a + 11          4            b = (b + 1) * 11    4            c = 2 * (c + 5)
5            print(a)            5            print(b)            5            print(c)
6            if a mod 3 == 0:    6            if b mod 3 == 1:    6            if c mod 3 == 2:
7                transfer t()    7                transfer w()    7                transfer w()
8            else:               8            else:               8            else:
9                transfer f()    9                transfer f()    9                transfer t()
```

Imprime:
11
12
22
22
34
253

	1	c	~~1 12~~ 34
f	0	pc	~~2 4 5 6 9 4 5 6~~ 9

	1	b	~~1 22~~ 253
t	0	pc	~~2 4 5 6 7 4 5 6~~ 7

	1	a	~~0 11~~ 22
w	0	pc	~~2 4 5 6 9 4 5 6 9~~ 4

Línea: 5

```
1    coroutine w():
2        int a = 0
3        loop:
4            a = a + 11
5            print(a)
6            if a mod 3 == 0:
7                transfer t()
8            else:
9                transfer f()
```

```
1    coroutine t():
2        int b = 1
3        loop:
4            b = (b + 1) * 11
5            print(b)
6            if b mod 3 == 1:
7                transfer w()
8            else:
9                transfer f()
```

```
1    coroutine f():
2        int c = 1
3        loop:
4            c = 2 * (c + 5)
5            print(c)
6            if c mod 3 == 2:
7                transfer w()
8            else:
9                transfer t()
```

Imprime:
11
12
22
22
34
253

f	1	c	~~1 12~~ 34
	0	pc	~~2 4 5 6 9 4 5 6~~ 9

t	1	b	~~1 22~~ 253
	0	pc	~~2 4 5 6 7 4 5 6~~ 7

w	1	a	~~0 11 22~~ 33
	0	pc	~~2 4 5 6 9 4 5 6 9 4~~ 5

Línea: 6

```
1    coroutine w():
2        int a = 0
3        loop:
4            a = a + 11
5            print(a)
6            if a mod 3 == 0:
7                transfer t()
8            else:
9                transfer f()
```

```
1    coroutine t():
2        int b = 1
3        loop:
4            b = (b + 1) * 11
5            print(b)
6            if b mod 3 == 1:
7                transfer w()
8            else:
9                transfer f()
```

```
1    coroutine f():
2        int c = 1
3        loop:
4            c = 2 * (c + 5)
5            print(c)
6            if c mod 3 == 2:
7                transfer w()
8            else:
9                transfer t()
```

Imprime:
11
12
22
22
34
253
33

f	1	c	~~1 12~~ 34
	0	pc	~~2 4 5 6 9 4 5 6~~ 9

t	1	b	~~1 22~~ 253
	0	pc	~~2 4 5 6 7 4 5 6~~ 7

w	1	a	~~0 11 22~~ 33
	0	pc	~~2 4 5 6 9 4 5 6 9 4 5~~ 6

Línea: 7

```
1    coroutine w():
2        int a = 0
3        loop:
4            a = a + 11
5            print(a)
6            if a mod 3 == 0:
7                transfer t()
8            else:
9                transfer f()
```

```
1    coroutine t():
2        int b = 1
3        loop:
4            b = (b + 1) * 11
5            print(b)
6            if b mod 3 == 1:
7                transfer w()
8            else:
9                transfer f()
```

```
1    coroutine f():
2        int c = 1
3        loop:
4            c = 2 * (c + 5)
5            print(c)
6            if c mod 3 == 2:
7                transfer w()
8            else:
9                transfer t()
```

Imprime:
11
12
22
22
34
253
33

f	1	c	~~1~~ ~~12~~ 34
	0	pc	~~2 4 5 6 9 4 5 6~~ 9

t	1	b	~~1~~ ~~22~~ 253
	0	pc	~~2 4 5 6 7 4 5 6~~ 7

w	1	a	~~0~~ ~~11~~ ~~22~~ 33
	0	pc	~~2 4 5 6 9 4 5 6 9 4 5 6~~ 7

Línea: 4

```
1    coroutine w():                    1    coroutine t():                    1    coroutine f():
2        int a = 0                     2        int b = 1                     2        int c = 1
3        loop:                         3        loop:                         3        loop:
4            a = a + 11                4            b = (b + 1) * 11          4            c = 2 * (c + 5)
5            print(a)                  5            print(b)                  5            print(c)
6            if a mod 3 == 0:          6            if b mod 3 == 1:          6            if c mod 3 == 2:
7                transfer t()          7                transfer w()          7                transfer w()
8            else:                     8            else:                     8            else:
9                transfer f()          9                transfer f()          9                transfer t()
```

Imprime:
11
12
22
22
34
253
33

f	1	c	~~1~~ ~~12~~ 34
	0	pc	~~2~~ ~~4~~ ~~5~~ ~~6~~ ~~9~~ ~~4~~ ~~5~~ ~~6~~ 9

t	1	b	~~1~~ ~~22~~ 253
	0	pc	~~2~~ ~~4~~ ~~5~~ ~~6~~ ~~7~~ ~~4~~ ~~5~~ ~~6~~ ~~7~~ 4

w	1	a	~~0~~ ~~11~~ ~~22~~ 33
	0	pc	~~2~~ ~~4~~ ~~5~~ ~~6~~ ~~9~~ ~~4~~ ~~5~~ ~~6~~ ~~9~~ ~~4~~ ~~5~~ ~~6~~ 7

Línea: 5

```
1    coroutine w():              1    coroutine t():              1    coroutine f():
2        int a = 0               2        int b = 1               2        int c = 1
3        loop:                   3        loop:                   3        loop:
4            a = a + 11          4            b = (b + 1) * 11    4            c = 2 * (c + 5)
5            print(a)            5            print(b)            5            print(c)
6            if a mod 3 == 0:    6            if b mod 3 == 1:    6            if c mod 3 == 2:
7                transfer t()    7                transfer w()    7                transfer w()
8            else:               8            else:               8            else:
9                transfer f()    9                transfer f()    9                transfer t()
```

Imprime:
11
12
22
22
34
253
33

f	1	c	~~1 12~~ 34
	0	pc	~~2 4 5 6 9 4 5 6~~ 9

t	1	b	~~1 22 253~~ 2794
	0	pc	~~2 4 5 6 7 4 5 6 7 4~~ 5

w	1	a	~~0 11 22~~ 33
	0	pc	~~2 4 5 6 9 4 5 6 9 4 5 6~~ 7

```
1    coroutine w():              1    coroutine t():              1    coroutine f():
2        int a = 0               2        int b = 1               2        int c = 1
3        loop:                   3        loop:                   3        loop:
4            a = a + 11          4            b = (b + 1) * 11    4            c = 2 * (c + 5)
5            print(a)            5            print(b)            5            print(c)
6            if a mod 3 == 0:    6            if b mod 3 == 1:    6            if c mod 3 == 2:
7                transfer t()    7                transfer w()    7                transfer w()
8            else:               8            else:               8            else:
9                transfer f()    9                transfer f()    9                transfer t()
```

Imprime:
11
12
22
22
34
253
33
2794

f	1	c	~~1 12~~ 34
	0	pc	~~2 4 5 6 9 4 5 6~~ 9

t	1	b	~~1 22 253~~ 2794
	0	pc	~~2 4 5 6 7 4 5 6 7 4 5~~ 6

w	1	a	~~0 11 22~~ 33
	0	pc	~~2 4 5 6 9 4 5 6 9 4 5 6~~ 7

```
1    coroutine w():
2        int a = 0
3        loop:
4            a = a + 11
5            print(a)
6            if a mod 3 == 0:
7                transfer t()
8            else:
9                transfer f()
```

```
1    coroutine t():
2        int b = 1
3        loop:
4            b = (b + 1) * 11
5            print(b)
6            if b mod 3 == 1:
7                transfer w()
8            else:
9                transfer f()
```

```
1    coroutine f():
2        int c = 1
3        loop:
4            c = 2 * (c + 5)
5            print(c)
6            if c mod 3 == 2:
7                transfer w()
8            else:
9                transfer t()
```

Imprime:
11
12
22
22
34
253
33
2794

f	1	c	~~1 12~~ 34
	0	pc	~~2 4 5 6 9 4 5 6~~ 9

t	1	b	~~1 22 253~~ 2794
	0	pc	~~2 4 5 6 7 4 5 6 7 4 5 6~~ 7

w	1	a	~~0 11 22~~ 33
	0	pc	~~2 4 5 6 9 4 5 6 9 4 5 6~~ 7

Línea: 4

```
1    coroutine w():
2        int a = 0
3        loop:
4            a = a + 11
5            print(a)
6            if a mod 3 == 0:
7                transfer t()
8            else:
9                transfer f()
```

```
1    coroutine t():
2        int b = 1
3        loop:
4            b = (b + 1) * 11
5            print(b)
6            if b mod 3 == 1:
7                transfer w()
8            else:
9                transfer f()
```

```
1    coroutine f():
2        int c = 1
3        loop:
4            c = 2 * (c + 5)
5            print(c)
6            if c mod 3 == 2:
7                transfer w()
8            else:
9                transfer t()
```

Imprime:
11
12
22
22
34
253
33
2794

f	1	c	~~1 12~~ 34
	0	pc	~~2 4 5 6 9 4 5 6~~ 9

t	1	b	~~1 22 253~~ 2794
	0	pc	~~2 4 5 6 7 4 5 6 7 4 5 6~~ 7

w	1	a	~~0 11 22~~ 33
	0	pc	~~2 4 5 6 9 4 5 6 9 4 5 6 7~~ 4

Línea: 5

```
1    coroutine w():
2        int a = 0
3        loop:
4            a = a + 11
5            print(a)
6            if a mod 3 == 0:
7                transfer t()
8            else:
9                transfer f()
```

```
1    coroutine t():
2        int b = 1
3        loop:
4            b = (b + 1) * 11
5            print(b)
6            if b mod 3 == 1:
7                transfer w()
8            else:
9                transfer f()
```

```
1    coroutine f():
2        int c = 1
3        loop:
4            c = 2 * (c + 5)
5            print(c)
6            if c mod 3 == 2:
7                transfer w()
8            else:
9                transfer t()
```

Imprime:
11
12
22
22
34
253
33
2794

| f | 1 | c | 1 12 34 |
| | 0 | pc | 2 4 5 6 9 4 5 6 9 |

| t | 1 | b | 1 22 253 2794 |
| | 0 | pc | 2 4 5 6 7 4 5 6 7 4 5 6 7 |

| w | 1 | a | 0 11 22 33 44 |
| | 0 | pc | 2 4 5 6 9 4 5 6 9 4 5 6 7 4 5 |

```
1    coroutine w():
2        int a = 0
3        loop:
4            a = a + 11
5            print(a)
6            if a mod 3 == 0:
7                transfer t()
8            else:
9                transfer f()
```

```
1    coroutine t():
2        int b = 1
3        loop:
4            b = (b + 1) * 11
5            print(b)
6            if b mod 3 == 1:
7                transfer w()
8            else:
9                transfer f()
```

```
1    coroutine f():
2        int c = 1
3        loop:
4            c = 2 * (c + 5)
5            print(c)
6            if c mod 3 == 2:
7                transfer w()
8            else:
9                transfer t()
```

Imprime:
11
12
22
22
34
253
33
2794
44

f	1	c	~~1 12~~ 34
	0	pc	~~2 4 5 6 9 4 5 6~~ 9

t	1	b	~~1 22 253~~ 2794
	0	pc	~~2 4 5 6 7 4 5 6 7 4 5 6~~ 7

w	1	a	~~0 11 22 33~~ 44
	0	pc	~~2 4 5 6 9 4 5 6 9 4 5 6 7 4 5~~ 6

Línea: 9

```
1    coroutine w():              1    coroutine t():              1    coroutine f():
2        int a = 0               2        int b = 1               2        int c = 1
3        loop:                   3        loop:                   3        loop:
4            a = a + 11          4            b = (b + 1) * 11    4            c = 2 * (c + 5)
5            print(a)            5            print(b)            5            print(c)
6            if a mod 3 == 0:    6            if b mod 3 == 1:    6            if c mod 3 == 2:
7                transfer t()    7                transfer w()    7                transfer w()
8            else:               8            else:               8            else:
9                transfer f()    9                transfer f()    9                transfer t()
```

Imprime:
11
12
22
22
34
253
33
2794
44

| f | 1 | c | 1 12 34 |
| | 0 | pc | 2 4 5 6 9 4 5 6 9 |

| t | 1 | b | 1 22 253 2794 |
| | 0 | pc | 2 4 5 6 7 4 5 6 7 4 5 6 7 |

| w | 1 | a | 0 11 22 33 44 |
| | 0 | pc | 2 4 5 6 9 4 5 6 9 4 5 6 7 4 5 6 9 |

Línea: 4

```
1    coroutine w():
2        int a = 0
3        loop:
4            a = a + 11
5            print(a)
6            if a mod 3 == 0:
7                transfer t()
8            else:
9                transfer f()
```

```
1    coroutine t():
2        int b = 1
3        loop:
4            b = (b + 1) * 11
5            print(b)
6            if b mod 3 == 1:
7                transfer w()
8            else:
9                transfer f()
```

```
1    coroutine f():
2        int c = 1
3        loop:
4            c = 2 * (c + 5)
5            print(c)
6            if c mod 3 == 2:
7                transfer w()
8            else:
9                transfer t()
```

Imprime:
11
12
22
22
34
253
33
2794
44

f	1	c	~~1 12~~ 34
	0	pc	~~2 4 5 6 9 4 5 6 9~~ 4

t	1	b	~~1 22 253~~ 2794
	0	pc	~~2 4 5 6 7 4 5 6 7 4 5 6~~ 7

w	1	a	~~0 11 22 33~~ 44
	0	pc	~~2 4 5 6 9 4 5 6 9 4 5 6 7 4 5 6~~ 9

Línea: **5**

```
1    coroutine w():          1    coroutine t():          1    coroutine f():
2        int a = 0           2        int b = 1           2        int c = 1
3        loop:               3        loop:               3        loop:
4            a = a + 11      4            b = (b + 1) * 11 4            c = 2 * (c + 5)
5            print(a)        5            print(b)        5            print(c)
6            if a mod 3 == 0:6            if b mod 3 == 1:6            if c mod 3 == 2:
7                transfer t()7                transfer w()7                transfer w()
8            else:           8            else:           8            else:
9                transfer f()9                transfer f()9                transfer t()
```

Imprime:
11
12
22
22
34
253
33
2794
44

f	1	c	~~1~~ ~~12~~ ~~34~~ 78
	0	pc	~~2 4 5 6 9 4 5 6 9 4~~ 5

t	1	b	~~1~~ ~~22~~ ~~253~~ 2794
	0	pc	~~2 4 5 6 7 4 5 6 7 4 5 6~~ 7

w	1	a	~~0~~ ~~11~~ ~~22~~ ~~33~~ 44
	0	pc	~~2 4 5 6 9 4 5 6 9 4 5 6 7 4 5 6~~ 9

Línea: 6

```
1    coroutine w():
2        int a = 0
3        loop:
4            a = a + 11
5            print(a)
6            if a mod 3 == 0:
7                transfer t()
8            else:
9                transfer f()
```

```
1    coroutine t():
2        int b = 1
3        loop:
4            b = (b + 1) * 11
5            print(b)
6            if b mod 3 == 1:
7                transfer w()
8            else:
9                transfer f()
```

```
1    coroutine f():
2        int c = 1
3        loop:
4            c = 2 * (c + 5)
5            print(c)
6            if c mod 3 == 2:
7                transfer w()
8            else:
9                transfer t()
```

Imprime:
11
12
22
22
34
253
33
2794
44
78

f	1	c	~~1 12 34~~ 78
	0	pc	~~2 4 5 6 9 4 5 6 9 4 5~~ 6

t	1	b	~~1 22 253~~ 2794
	0	pc	~~2 4 5 6 7 4 5 6 7 4 5 6~~ 7

w	1	a	~~0 11 22 33~~ 44
	0	pc	~~2 4 5 6 9 4 5 6 9 4 5 6 7 4 5 6~~ 9