```
hello.hl:
[001, 001] (0030,          ID) {fib}
[001, 004] (0022,       PARST) {(}
[001, 005] (0008,       PTYPE) {int}
[001, 009] (0030,          ID) {n}
[001, 010] (0025,      PAREND) {)}
[001, 012] (0024,      CLBRST) {{}
[002, 005] (0008,       PTYPE) {int}
[002, 009] (0030,          ID) {a}
[002, 011] (0013,        OPAT) {=}
[002, 013] (0010,      CTEINT) {0}
[002, 014] (0020,          ST) {;}
[003, 005] (0008,       PTYPE) {int}
[003, 009] (0030,          ID) {b}
[003, 011] (0013,        OPAT) {=}
[003, 013] (0010,      CTEINT) {1}
[003, 014] (0020,          ST) {;}
[004, 005] (0008,       PTYPE) {int}
[004, 009] (0030,          ID) {next}
[004, 013] (0020,          ST) {;}
[006, 005] (0006,     KWWHILE) {while}
[006, 010] (0022,       PARST) {(}
[006, 011] (0030,          ID) {a}
[006, 013] (0012,       OPCMP) {<}
[006, 015] (0030,          ID) {n}
[006, 016] (0025,      PAREND) {)}
[006, 018] (0024,      CLBRST) {{}
[007, 009] (0002,        KWIO) {print}
[007, 014] (0022,       PARST) {(}
[007, 015] (0030,          ID) {a}
[007, 016] (0025,      PAREND) {)}
[007, 017] (0020,          ST) {;}
[008, 009] (0030,          ID) {next}
[008, 014] (0013,        OPAT) {=}
[008, 016] (0030,          ID) {a}
[008, 018] (0015,        OPAD) {+}
[008, 020] (0030,          ID) {b}
[008, 021] (0020,          ST) {;}
[009, 009] (0030,          ID) {a}
[009, 011] (0013,        OPAT) {=}
[009, 013] (0030,          ID) {b}
[009, 014] (0020,          ST) {;}
[010, 009] (0030,          ID) {b}
[010, 011] (0013,        OPAT) {=}
[010, 013] (0030,          ID) {next}
[010, 017] (0020,          ST) {;}
[011, 005] (0027,     CLBREND) {}}
[012, 001] (0027,     CLBREND) {}}
[014, 001] (0001,      KWMAIN) {main}
[014, 005] (0022,       PARST) {(}
[014, 006] (0025,      PAREND) {)}
[014, 008] (0024,      CLBRST) {{}
[015, 005] (0002,        KWIO) {print}
[015, 010] (0022,       PARST) {(}
[015, 011] (0028,      STRING) {"Ola mundo!"}
[015, 023] (0025,      PAREND) {)}
[015, 024] (0020,          ST) {;}
[016, 001] (0027,     CLBREND) {}}

fib.hl:
[001, 001] (0030,          ID) {fib}
[001, 004] (0022,       PARST) {(}
[001, 005] (0008,       PTYPE) {int}
[001, 009] (0030,          ID) {n}
[001, 010] (0025,      PAREND) {)}
[001, 012] (0024,      CLBRST) {{}
[002, 005] (0008,       PTYPE) {int}
[002, 009] (0030,          ID) {a}
[002, 011] (0013,        OPAT) {=}
[002, 013] (0010,      CTEINT) {0}
[002, 014] (0020,          ST) {;}
[003, 005] (0008,       PTYPE) {int}
[003, 009] (0030,          ID) {b}
```

```
 74     [003, 011] (0013,        OPAT) {=}
 75     [003, 013] (0010,      CTEINT) {1}
 76     [003, 014] (0020,          ST) {;}
 77     [004, 005] (0008,       PTYPE) {int}
 78     [004, 009] (0030,          ID) {next}
 79     [004, 013] (0020,          ST) {;}
 80     [006, 005] (0006,    KWWHILE) {while}
 81     [006, 010] (0022,       PARST) {(}
 82     [006, 011] (0030,          ID) {a}
 83     [006, 013] (0012,       OPCMP) {<}
 84     [006, 015] (0030,          ID) {n}
 85     [006, 016] (0025,      PAREND) {)}
 86     [006, 018] (0024,      CLBRST) {{}
 87     [007, 009] (0002,        KWIO) {print}
 88     [007, 014] (0022,       PARST) {(}
 89     [007, 015] (0030,          ID) {a}
 90     [007, 016] (0025,      PAREND) {)}
 91     [007, 017] (0020,          ST) {;}
 92     [008, 009] (0030,          ID) {next}
 93     [008, 014] (0013,        OPAT) {=}
 94     [008, 016] (0030,          ID) {a}
 95     [008, 018] (0015,       OPAD) {+}
 96     [008, 020] (0030,          ID) {b}
 97     [008, 021] (0020,          ST) {;}
 98     [009, 009] (0030,          ID) {a}
 99     [009, 011] (0013,        OPAT) {=}
100     [009, 013] (0030,          ID) {b}
101     [009, 014] (0020,          ST) {;}
102     [010, 009] (0030,          ID) {b}
103     [010, 011] (0013,        OPAT) {=}
104     [010, 013] (0030,          ID) {next}
105     [010, 017] (0020,          ST) {;}
106     [011, 005] (0027,     CLBREND) {}}
107     [012, 001] (0027,     CLBREND) {}}
108
109     shellsort.hl:
110     [001, 001] (0008,       PTYPE) {int}
111     [001, 005] (0030,          ID) {maxsize}
112     [001, 013] (0013,        OPAT) {=}
113     [001, 015] (0010,      CTEINT) {10}
114     [001, 017] (0020,          ST) {;}
115     [003, 001] (0008,       PTYPE) {int}
116     [003, 004] (0023,      SQBRST) {[}
117     [003, 005] (0026,     SQBREND) {]}
118     [003, 007] (0030,          ID) {shellsort}
119     [003, 016] (0022,       PARST) {(}
120     [003, 017] (0008,       PTYPE) {int}
121     [003, 020] (0023,      SQBRST) {[}
122     [003, 021] (0026,     SQBREND) {]}
123     [003, 023] (0030,          ID) {array}
124     [003, 028] (0025,      PAREND) {)}
125     [003, 030] (0024,      CLBRST) {{}
126     [004, 005] (0008,       PTYPE) {int}
127     [004, 009] (0030,          ID) {inner}
128     [004, 014] (0021,         CLN) {,}
129     [004, 016] (0030,          ID) {outer}
130     [004, 021] (0020,          ST) {;}
131     [005, 005] (0008,       PTYPE) {int}
132     [005, 009] (0030,          ID) {valueToInsert}
133     [005, 022] (0020,          ST) {;}
134     [006, 005] (0008,       PTYPE) {int}
135     [006, 009] (0030,          ID) {interval}
136     [006, 018] (0013,        OPAT) {=}
137     [006, 020] (0010,      CTEINT) {1}
138     [006, 021] (0020,          ST) {;}
139     [007, 005] (0008,       PTYPE) {int}
140     [007, 009] (0030,          ID) {elements}
141     [007, 018] (0013,        OPAT) {=}
142     [007, 020] (0030,          ID) {maxsize}
143     [007, 027] (0020,          ST) {;}
144     [008, 005] (0008,       PTYPE) {int}
145     [008, 009] (0030,          ID) {i}
146     [008, 011] (0013,        OPAT) {=}
```

```
147    [008, 013] (0010,     CTEINT) {0}
148    [008, 014] (0020,         ST) {;}
149    [010, 005] (0006,    KWWHILE) {while}
150    [010, 010] (0022,      PARST) {(}
151    [010, 011] (0030,         ID) {interval}
152    [010, 021] (0012,      OPCMP) {<=}
153    [010, 024] (0030,         ID) {elements}
154    [010, 033] (0016,       OPML) {/}
155    [010, 035] (0010,     CTEINT) {3}
156    [010, 036] (0025,     PAREND) {)}
157    [010, 038] (0024,     CLBRST) {{}
158    [011, 009] (0030,         ID) {interval}
159    [011, 018] (0013,       OPAT) {=}
160    [011, 020] (0030,         ID) {interval}
161    [011, 029] (0016,       OPML) {*}
162    [011, 031] (0010,     CTEINT) {3}
163    [011, 033] (0015,       OPAD) {+}
164    [011, 035] (0010,     CTEINT) {1}
165    [011, 036] (0020,         ST) {;}
166    [012, 005] (0027,    CLBREND) {}}
167    [014, 005] (0006,    KWWHILE) {while}
168    [014, 010] (0022,      PARST) {(}
169    [014, 011] (0030,         ID) {interval}
170    [014, 020] (0012,      OPCMP) {>}
171    [014, 022] (0010,     CTEINT) {0}
172    [014, 023] (0025,     PAREND) {)}
173    [014, 025] (0024,     CLBRST) {{}
174    [015, 009] (0030,         ID) {outer}
175    [015, 015] (0013,       OPAT) {=}
176    [015, 017] (0030,         ID) {interval}
177    [015, 025] (0020,         ST) {;}
178    [016, 006] (0005,      KWFOR) {for}
179    [016, 010] (0030,         ID) {outer}
180    [016, 016] (0014,      OPMBR) {in}
181    [016, 019] (0007,    KWRANGE) {range}
182    [016, 024] (0022,      PARST) {(}
183    [016, 025] (0030,         ID) {outer}
184    [016, 030] (0021,        CLN) {,}
185    [016, 032] (0030,         ID) {elements}
186    [016, 040] (0025,     PAREND) {)}
187    [016, 042] (0024,     CLBRST) {{}
188    [017, 010] (0030,         ID) {valueToInsert}
189    [017, 024] (0013,       OPAT) {=}
190    [017, 026] (0030,         ID) {array}
191    [017, 031] (0023,     SQBRST) {[}
192    [017, 032] (0030,         ID) {outer}
193    [017, 037] (0026,    SQBREND) {]}
194    [017, 038] (0020,         ST) {;}
195    [018, 006] (0030,         ID) {inner}
196    [018, 012] (0013,       OPAT) {=}
197    [018, 014] (0030,         ID) {outer}
198    [020, 006] (0006,    KWWHILE) {while}
199    [020, 011] (0022,      PARST) {(}
200    [020, 012] (0030,         ID) {inner}
201    [020, 018] (0012,      OPCMP) {>}
202    [020, 020] (0022,      PARST) {(}
203    [020, 021] (0030,         ID) {interval}
204    [020, 030] (0015,       OPAD) {-}
205    [020, 032] (0010,     CTEINT) {1}
206    [020, 033] (0025,     PAREND) {)}
207    [020, 035] (0017,     OPCONJ) {and}
208    [020, 039] (0030,         ID) {array}
209    [020, 044] (0023,     SQBRST) {[}
210    [020, 045] (0030,         ID) {inner}
211    [020, 051] (0015,       OPAD) {-}
212    [020, 053] (0030,         ID) {interval}
213    [020, 061] (0026,    SQBREND) {]}
214    [020, 063] (0012,      OPCMP) {>=}
215    [020, 066] (0030,         ID) {valueToInsert}
216    [020, 079] (0025,     PAREND) {)}
217    [020, 081] (0024,     CLBRST) {{}
218    [021, 014] (0030,         ID) {array}
219    [021, 019] (0023,     SQBRST) {[}
```

```
220    [021, 020] (0030,       ID) {inner}
221    [021, 025] (0026,  SQBREND) {]}
222    [021, 027] (0013,     OPAT) {=}
223    [021, 029] (0030,       ID) {array}
224    [021, 034] (0023,   SQBRST) {[}
225    [021, 035] (0030,       ID) {inner}
226    [021, 041] (0015,     OPAD) {-}
227    [021, 043] (0030,       ID) {interval}
228    [021, 051] (0026,  SQBREND) {]}
229    [021, 052] (0020,       ST) {;}
230    [022, 014] (0030,       ID) {inner}
231    [022, 020] (0013,     OPAT) {=}
232    [022, 022] (0030,       ID) {inner}
233    [022, 028] (0015,     OPAD) {-}
234    [022, 030] (0030,       ID) {interval}
235    [022, 038] (0020,       ST) {;}
236    [023, 006] (0027,  CLBREND) {}}
237    [025, 010] (0030,       ID) {array}
238    [025, 015] (0023,   SQBRST) {[}
239    [025, 016] (0030,       ID) {inner}
240    [025, 021] (0026,  SQBREND) {]}
241    [025, 023] (0013,     OPAT) {=}
242    [025, 025] (0030,       ID) {valueToInsert}
243    [025, 038] (0020,       ST) {;}
244    [026, 006] (0027,  CLBREND) {}}
245    [028, 006] (0030,       ID) {interval}
246    [028, 015] (0013,     OPAT) {=}
247    [028, 017] (0022,    PARST) {(}
248    [028, 018] (0030,       ID) {interval}
249    [028, 027] (0015,     OPAD) {-}
250    [028, 029] (0010,   CTEINT) {1}
251    [028, 030] (0025,   PAREND) {)}
252    [028, 032] (0016,     OPML) {/}
253    [028, 034] (0010,   CTEINT) {3}
254    [028, 035] (0020,       ST) {;}
255    [029, 006] (0030,       ID) {i}
256    [029, 008] (0013,     OPAT) {=}
257    [029, 010] (0030,       ID) {i}
258    [029, 012] (0015,     OPAD) {+}
259    [029, 014] (0010,   CTEINT) {1}
260    [029, 015] (0020,       ST) {;}
261    [030, 005] (0027,  CLBREND) {}}
262    [032, 005] (0029, KWRETURN) {return}
263    [032, 012] (0030,       ID) {array}
264    [032, 017] (0020,       ST) {;}
265    [033, 001] (0027,  CLBREND) {}}
266    [035, 001] (0030,       ID) {print_array}
267    [035, 012] (0022,    PARST) {(}
268    [035, 013] (0008,    PTYPE) {int}
269    [035, 016] (0023,   SQBRST) {[}
270    [035, 017] (0026,  SQBREND) {]}
271    [035, 019] (0030,       ID) {array}
272    [035, 024] (0025,   PAREND) {)}
273    [035, 026] (0024,   CLBRST) {{}
274    [037, 005] (0008,    PTYPE) {int}
275    [037, 009] (0030,       ID) {i}
276    [037, 010] (0020,       ST) {;}
277    [039, 005] (0002,    KWIO) {print}
278    [039, 010] (0022,    PARST) {(}
279    [039, 011] (0028,   STRING) {"["}
280    [039, 014] (0025,   PAREND) {)}
281    [039, 015] (0020,       ST) {;}
282    [040, 005] (0005,    KWFOR) {for}
283    [040, 009] (0030,       ID) {i}
284    [040, 011] (0014,    OPMBR) {in}
285    [040, 014] (0007,  KWRANGE) {range}
286    [040, 019] (0022,    PARST) {(}
287    [040, 020] (0010,   CTEINT) {0}
288    [040, 021] (0021,      CLN) {,}
289    [040, 023] (0030,       ID) {maxsize}
290    [040, 030] (0025,   PAREND) {)}
291    [040, 032] (0024,   CLBRST) {{}
292    [041, 006] (0002,    KWIO) {print}
```

```
293    [041, 011] (0022,        PARST) {(}
294    [041, 012] (0028,       STRING) {"%d "}
295    [041, 017] (0021,          CLN) {,}
296    [041, 019] (0030,           ID) {array}
297    [041, 024] (0023,       SQBRST) {[}
298    [041, 025] (0030,           ID) {i}
299    [041, 026] (0026,      SQBREND) {]}
300    [041, 027] (0025,       PAREND) {)}
301    [041, 028] (0020,           ST) {;}
302    [042, 005] (0027,      CLBREND) {}}
303    [043, 005] (0002,         KWIO) {print}
304    [043, 010] (0022,        PARST) {(}
305    [043, 011] (0028,       STRING) {"]\n"}
306    [043, 016] (0025,       PAREND) {)}
307    [043, 017] (0020,           ST) {;}
308    [044, 001] (0027,      CLBREND) {}}
309    [046, 001] (0001,       KWMAIN) {main}
310    [046, 005] (0022,        PARST) {(}
311    [046, 006] (0025,       PAREND) {)}
312    [046, 008] (0024,       CLBRST) {{}
313    [047, 005] (0008,        PTYPE) {int}
314    [047, 009] (0030,           ID) {array}
315    [047, 015] (0013,         OPAT) {=}
316    [047, 017] (0023,       SQBRST) {[}
317    [047, 018] (0010,       CTEINT) {5}
318    [047, 019] (0021,          CLN) {,}
319    [047, 021] (0010,       CTEINT) {7}
320    [047, 022] (0021,          CLN) {,}
321    [047, 024] (0010,       CTEINT) {2}
322    [047, 025] (0021,          CLN) {,}
323    [047, 027] (0010,       CTEINT) {0}
324    [047, 028] (0021,          CLN) {,}
325    [047, 030] (0010,       CTEINT) {9}
326    [047, 031] (0021,          CLN) {,}
327    [047, 033] (0010,       CTEINT) {6}
328    [047, 034] (0021,          CLN) {,}
329    [047, 036] (0010,       CTEINT) {1}
330    [047, 037] (0021,          CLN) {,}
331    [047, 039] (0010,       CTEINT) {3}
332    [047, 040] (0021,          CLN) {,}
333    [047, 042] (0010,       CTEINT) {4}
334    [047, 043] (0021,          CLN) {,}
335    [047, 045] (0010,       CTEINT) {8}
336    [047, 046] (0026,      SQBREND) {]}
337    [047, 047] (0020,           ST) {;}
338    [049, 005] (0002,         KWIO) {print}
339    [049, 010] (0022,        PARST) {(}
340    [049, 011] (0028,       STRING) {"Array Original: "}
341    [049, 029] (0025,       PAREND) {)}
342    [049, 030] (0020,           ST) {;}
343    [050, 005] (0030,           ID) {print_array}
344    [050, 016] (0022,        PARST) {(}
345    [050, 017] (0030,           ID) {array}
346    [050, 022] (0025,       PAREND) {)}
347    [050, 023] (0020,           ST) {;}
348    [052, 005] (0002,         KWIO) {print}
349    [052, 010] (0022,        PARST) {(}
350    [052, 011] (0028,       STRING) {"Array Ordenado: "}
351    [052, 029] (0025,       PAREND) {)}
352    [052, 030] (0020,           ST) {;}
353    [053, 005] (0030,           ID) {print_array}
354    [053, 016] (0022,        PARST) {(}
355    [053, 017] (0030,           ID) {shellsort}
356    [053, 026] (0022,        PARST) {(}
357    [053, 027] (0030,           ID) {array}
358    [053, 032] (0025,       PAREND) {)}
359    [053, 033] (0025,       PAREND) {)}
360    [053, 034] (0020,           ST) {;}
361    [054, 001] (0027,      CLBREND) {}}
362
363
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