

```

BLOCK entry {
  force <- $point(0,0)$[];
  G <- $6.67e-11$[];
  node <- $SELECT b FROM barneshut AS b WHERE b.node = 0$[];
  GOTO inter0
}

```

```

BLOCK inter0 {
  Q <- $array[{0}]$[node];
  GOTO loop_head
}

```

```

BLOCK loop_head {
  node <- ${0}[1]$[Q];
  GOTO inter4
}

```

```

BLOCK inter4 {
  Q <- ${0}[2:]$[Q];
  dist <- $GREATEST(distance({0}.center, {1}.pos), 1e-10)$[node, body];
  dir <- $point({0}.center.x - {1}.pos.x, {0}.center.y - {1}.pos.y)$[node, body];
  IF $NOT EXISTS (SELECT 1
    FROM walls AS w
    WHERE left_of({0}.pos, w.wall) <> left_of({1}.center, w.wall))$[body, node]
  THEN GOTO truthy0
  ELSE GOTO falsey0
}

```

```

BLOCK truthy0 {
  grav <- $point(({0} * {1}.mass * {2}.mass / {3}^2) * {4}.x,
    ({0} * {1}.mass * {2}.mass / {3}^2) * {4}.y)$[G, body, node, dist, dir];
  IF ${0}.node IS NULL OR width({0}.bbox) / {1} < {2}$[node, dist, theta]
  THEN GOTO truthy1
  ELSE GOTO falsey1
}

```

```

BLOCK falsey0 {
  grav <- $point(0,0)$[];
  IF ${0}.node IS NULL OR width({0}.bbox) / {1} < {2}$[node, dist, theta]
  THEN GOTO truthy1
  ELSE GOTO falsey1
}

```

```

BLOCK falsey1 {
  Q <- $SELECT {0} || list(b)
    FROM barneshut AS b
    WHERE b.parent = {1}.node$[Q, node];
  GOTO inter11
}

```

```

BLOCK truthy1 {
  force <- $point({0}.x + {1}.x, {0}.y + {1}.y)$[force, grav];
  IF $len({0}) > 0$[Q]
  THEN JUMP loop_head
  ELSE GOTO falsey2
}

```

```

BLOCK inter11 {
  IF $len({0}) > 0$[Q]
  THEN JUMP loop_head
  ELSE GOTO falsey2
}

```

```

BLOCK falsey2 {
  EMIT ${0}$[force];
  STOP
}

```

