### Creating planes

Startup:

* Calculate and save camera bounds
* Start planes generation

Plane generation:

* Generate source and destination position, speeds and height
* Create plane object
* Assign values to plane
* Make plane the child of itself

### Plane life cycle

Plane life cycle:

* Calculate position
* If new position is in destination:
  + Destroy plane
  + return
* Set position
* Calculate height
* Set height
* Set sprite, colors according to its state
* Update texts
* If camera in Dispatcher mode:
  + Reset rotation
* Else:
  + Set rotation the same as observed plane
* If is selected and in near collision mode:
  + Call SCTA controller to take control of planes in collision

### Collision detection algorithm

* Get all planes in scene
* For each plane:
  + For each other planes:
    - Calculate distance between planes
    - If distance is less than critical:
      * If collision already exists:
        + Copy existing collision into new collection
      * Else:
        + Create new collision including the time of collision
    - Else:
      * Do nothing
* For each old collision:
  + Reset plane to normal mode
* Clear old collision list
* Set new collisions
* For each new collision:
  + If plane in normal state:
    - Set plane in Near collision state

### Collision prevention algorithm

* Get all collisions
* For each collision:
  + If collision is in SCTA controlled or not controlled:
    - If timer is exceeded:
      * Change control mode to TCAS

### STCA algorithm

Taking control of STCA collision:

* If there is selected collision:
  + Return collision in None mode
  + Return planes in NearCollision mode
* Save collision
* If collision is valid:
  + Change collision’s state to STCA controller and update planes’ mode
  + Update slider values to match current height and speed of planes

Workflow:

* If collision is not set:
  + Hide control canvas
  + Return
* Show control canvas
* Update planes’ height and speed as slider values
* Update planes’ information on canvas
* Calculate and show the distance between planes

### TCAS algorithm

* Get all collisions in TCAS mode
* For every collision:
  + If not in TCAS mode:
    - Continue;
  + If first plane is higher than the second:
    - Change the first plane’s height to dH
    - Change the second plane’s height to -dH
  + Else:
    - Change the first plane’s height to -dH
    - Change the second plane’s height to dH