```
    1: /**
    2: *  Class AirportRunways provides definitions of constants and helper methods
 for the Airport simulation.
    3: */
    4:
    5: #ifndef AIRPORT_RUNWAYS_H
    6: #define AIRPORT_RUNWAYS_H
    7:
    8: #include <iostream>
    9: #include <string>
   10: #include <mutex>
   11:
   12: using namespace std;
   13:
   14:
   15: class AirportRunways
   16: {
   17: public:
   18:
   19:         static const int NUM_RUNWAYS = 6;     // Number of runways in this s
imulation
   20:         static const int NUM_AIRPLANES = 7;   // Number of airplanes in this
 simulation
   21:         static const int MAX_LANDING_REQUESTS = 6; // Maximum number of simu
ltaneous landing requests that Air Traffic Control can handle
   22:
   23:         enum RunwayNumber { RUNWAY_4L, RUNWAY_4R, RUNWAY_9, RUNWAY_14, RUNWA
Y_15L, RUNWAY_15R };
   24:
   25:         static mutex checkMutex; // enforce mutual exclusion on checkAirport
Status
   26:
   27:         static string runwayName(RunwayNumber rn);
   28:
   29:         /**
   30:         *  Check the status of the aiport with respect to any violation of t
he rules.
   31:         */
   32:         static void checkAirportStatus(RunwayNumber requestedRunway);
   33:
   34:         /**
   35:         *  requestRunway() and finishedWithRunway() are helper methods for k
eeping track of the airport status
   36:         */
   37:
   38:         static void requestRunway(RunwayNumber rn)
   39:         {
   40:                 runwayInUse[rn]++;
   41:
   42:         } // end useRunway()
   43:
   44:
   45:         static void finishedWithRunway(RunwayNumber rn)
   46:         {
   47:                 runwayInUse[rn]--;
   48:
   49:         } // end finishedWithRunway()
   50:
   51:
   52:         static int getNumLandingRequests()
   53:         {
```

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   54:                     return numLandingRequests;
   55:             }
   56:
   57:
   58:             static void incNumLandingRequests()
   59:             {
   60:                     numLandingRequests++;
   61:                     if (numLandingRequests > maxNumLandingRequests)
   62:                             maxNumLandingRequests = numLandingRequests;
   63:             }
   64:
   65:
   66:             static void decNumLandingRequests()
   67:             {
   68:                     numLandingRequests--;
   69:             }
   70:
   71:             static int runwayInUse[NUM_RUNWAYS]; // Keeps track of how many airp
lanes are attempting to land on a given runway
   72:
   73:             static int numLandingRequests; // Keeps track of the number of simul
taneous landing requests
   74:
   75:             static int maxNumLandingRequests; // Keeps track of the max number o
f simultaneous landing requests
   76:
   77:
   78: private:
   79:
   80:             /**
   81:              *  The following variables and methods are used to detect violation
s of the rules of this simulation.
   82:              */
   83:
   84: }; // end class AirportRunways
   85:
   86: #endif
   87:
```