

Software Design Document

Airport take-off time slot simulation in Python.

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Introduction

Airport is a busy place with vast numbers of people passing through, which in turn requires efficient processes to make it seamless. Lots of resources are mobilized according to schedules to enable this.

We can build programs that can simulate the request and delivery of services at the airports based on the events happening at a predetermined rate. By simulating/generating requests for resources we can simulate the process of servicing those requests.

Purpose

Description of the Problem

As planes taxi and takeoff, they request resources (gates, ground operations) to enable them. The request for the resources must be managed according to priorities and safety requirements. When planes are getting ready to take-off they request access to taxi in preparation for take-off from the runway.

The program we build will tackle the problem of taxiing planes that request resources. There will be priority queues set up which will keep track of turns. For test case the queue will empty out based on a probabilistic event. (if probability > x \rightarrow takeoff(dequeue) which allows us to simulate the operation.

In this project you will use the Python programming language to simulate aircraft take off time slots at an airport.

Design

The program will keep track of the information needed to schedule the airstrip resources.
program will request

Identifier;
Submission time;
Time slot requested;
Length of time requested;
Actual start time;
Actual end time from a plane;

The program will simulate a queue of airplanes waiting before they can take off.

There will be methods that will do the following functions

- Create a priority Queue that will store place Identifier in a queue
- Print out the status of the queue as time moves along.
- Populate the priority queue by generating planes of all types thru rand()..
- Be able to read requests document and populate the
- print out a listing of the actual take off times of all planes

Ex. Input text from file is as follows

ID, Submission Time, Requested Start, Requested Duration

Delta 160, 0, 0, 4

UAL 120, 0, 5, 4

Delta 6, 2, 3, 6

