Problem Brief: Drone Design

You are a part of a team that designs drone fleets for package and food delivery. Your new company is the first entrant in a market. To be successful in the market, your company must meet all the requirements given by your customer.

You are responsible for designing drones using the **Drone Design Module** and submitting the completed designs. The interface of the **Drone Design Module** is presented in Figure 1 and explained in detail in the online tutorial.

Using the **Drone Design Module** you can:

- Construct drones by adding building blocks such as connecting rods and proper components
- Check the drone design feasibility by running a simulation
- Assess the cost and the performance of the design
- Submit completed drone designs
- Use an automated DroneBot to assist in the design process

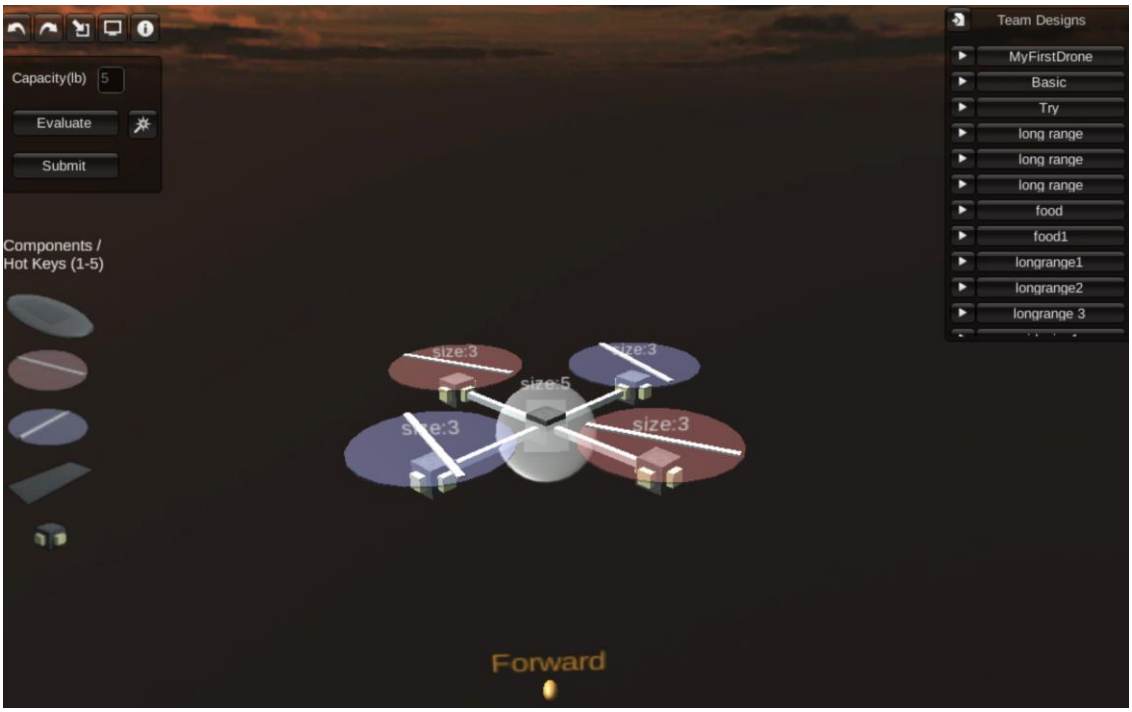

Figure 1 - Drone Design Interface

Your session will be broken into two equal time periods of 20 minutes after which you will take a short survey. You are required to complete the objectives presented below within the total period of 40 minutes. Each design objective has different constraints that you need to satisfy. Please complete each design objective in order of appearance, you should ***not*** skip to the next objective until you have completed all previous objectives. Once your design satisfies the objective, you should submit the drone design using the **Drone Design Module**. Please, name each drone with the objective number and the constraint letter. For example, the first drone in objective 1 should be labeled as obj1_a.

Drone Design Objectives

Objective 1 - Construct a fleet of 4 drones that meet the following parameters:

A. One drone capable of flying a total distance of 15 miles
B. One drone capable of flying a total distance of 25 miles
C. One drone capable of carrying a maximum payload of 10 lbs
D. One drone capable of carrying a maximum payload of 20 lbs

Objective 2 - Construct a fleet of 4 drones that meet the following parameters:

- All drones must be capable of flying at a minimum speed of 5 mph
  A. One drone capable of flying a total distance of 15 miles carrying at least 20 lbs
  B. One drone capable of flying a total distance of 20 miles carrying at least 15 lbs
  C. One drone capable of flying a total distance of 30 miles carrying at least 10 lbs
  D. One drone capable of flying a total distance of 40 miles carrying at least 5 lbs

Objective 3 - Construct a fleet of 3 drones that meet the following parameters:

- Each drone must individually cost less than $5000
  A. One drone capable of flying a total distance of 12 miles carrying 15 lbs
  B. One drone capable of flying a total distance of 12 miles carrying 30 lbs
  C. One drone capable of flying a total distance of 14 miles carrying 30 lb

Objective 4 - Construct a fleet of 4 drones that meet the following parameters:

- Each drone must individually cost less than $4000
  A. One drone capable of flying a total distance of 12 miles at 10 mph carrying 15lbs
  B. One drone capable of flying a total distance of 20 miles at 8 mph while carrying 25 lbs
  C. One drone capable of flying a total distance of 40 miles at 6 mph while carrying 16 lbs
  D. One drone capable of flying a total distance of 45 miles at 6 mph while carrying 18 lbs

Objective 5 - Construct a fleet of 3 drones that meet the following parameters:

- Each drone must individually cost less than $3000
  A. One drone capable of flying a total distance of 14 miles at 8 mph carrying 2lbs
  B. One drone capable of flying a total distance of 20 miles at 10 mph while carrying 2 lbs
  C. One drone capable of flying a total distance of 50 miles at 6 mph while carrying 1 lbs