

## Homework 2

1. A marine science major is interested in the effect of diet upon the growth of flatfish. Two different diet regimens (A and B), two different tank temperatures (15 and 25 degrees Celsius) and two different tank sizes (Small and Large) are explored. Each of a total of eight fish are randomly assigned to one of eight tank environments. The relative growth of the fish over a one month period is recorded below. Arrange the data in a cube plot. Compute all main effects and interaction effects. Summarize, in words, the effect of each factor. Which conditions seem most favorable for flatfish growth? Compute the EMR for these conditions.

Factor settings	Response (Relative Growth)
(A,15,Small)	18
(B,15,Small)	25
(A,25,Small)	33
(B,25,Small)	42
(A,15,Large)	21
(B,15,Large)	30
(A,25,Large)	33
(B,25,Large)	36

2. The ladder example may seem like an unfair comparison since the variance in the height estimates of the house depend on the length of the ladder as well as the nonlinearity of the sine curve. Consider an experiment in which three 24' ladders are leaned against a 10', 15' and 20' house respectively. Generate 20 estimates of the angle for each house with an angle standard deviation of 3 degrees. As an example, for the 10' house,  $\theta = \sin^{-1}(10/24) = .429775 = 24.6^\circ$ , so the angle and height estimates could be generated in Minitab as:

```
rand 50 c1;  
norm 24.6 3.  
let c2=24*sin(3.1416*c1/180)
```

Following the approach in your handout, compare the height estimates for the three approaches. Which house can be measured most accurately?