

```
* KHOONG WEI HAO ST2137 Tutorial 7 T03;
```

```
* Q1 (a) - (c);
```

```
proc format;
```

```
    value $locfmt "F" = "Front"
                  "M" = "Middle"
                  "R" = "Rear"
                  Other = "Miscoded";
```

```
data t7q2;
```

```
    infile "~/data/locate.txt" firstobs=2;
    input sales location $;
    format location $locfmt.;
```

```
proc anova data=t7q2;
```

```
    class location;
    model sales = location;
    means location /lsd hovtest=bartlett;
```

```
run;
```

\* Ans (a): We test  $H_0: \mu_1 = \mu_2 = \mu_3$  against  $H_1: \mu_i \neq \mu_j$  for some  $i \neq j$ .  
Since  $F_{obs} = 13.03 > F_{0.05} = 3.68$  or  $p\text{-value} = 0.0005 < 0.05$ , we reject  $H_0$ . ;

\* Ans (b): We see that  $|\bar{x}_1 - \bar{x}_2| > \text{LSD}$  and  $|\bar{x}_1 - \bar{x}_3| > \text{LSD}$  so the front aisle location is different from the other two locations while the middle and rear locations are not different in terms of the average sales volumes. ;

\* Ans (c): We check the assumption of homogeneity. Since the p-value of the Bartlett's Test is  $0.1161 > 0.05$ , we do not reject  $H_0$ . So there is no evidence of a significant difference in the variation in sales among the various aisle locations.;

```
* Q1 (d);
```

```
proc glm data=t7q2;
```

```
    class location;
    model sales = location;
    means location;
    contrast 'Middle vs Rear' location 0 1 -1;
    contrast 'Front vs Middle and Rear' location 2 -1 -1;
```

```
run;
```

\* Ans: The front aisle is best for the sale of this product. The manager should evaluate the tradeoff in switching the location of this product and the product that is currently intended for the front location.

Since the p-value for testing the hypothesis that  $C1 = 0$  is  $0.0696$ , greater than  $0.05$ , we do not reject the hypothesis that  $C1 = 0$ . Similarly, since the p-value is  $0.0003$  for testing  $C2 = 0$ , less than  $0.05$ , we reject the hypothesis that  $C2 = 0$ . Therefore, we conclude that front aisle location has a different average sales than that of the middle and the rear locations