# Assignment 4 MATH 208 (Question 1)

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MATH 208 - Assignment 4

(a)

```
class(ceramic_data)
```

```
## [1] "array"
```

(b)

```
medians_batch1_batch2 = apply(ceramic_data, c(5), median)
print(medians_batch1_batch2)
```

```
## Batch 1 Batch 2
## 605.185 548.015
```

```
diff_mean_by_batch = medians_batch1_batch2[[1]] - medians_batch1_batch2[[2]]
print(diff_mean_by_batch)
```

```
## [1] 57.17
```

(c)

```
standard_dev_all_observations = sd(c(ceramic_data[1:32]))
print(standard_dev_all_observations)
```

```
## [1] 112.2785
```

(d)

```
# Table for each of the 4 groups defined by the cross-classification
# of Table_Speed and Direction
table_speed = apply(ceramic_data, c(1,4), mean)
print(table_speed)
```

```
##            Direction
## Table_Speed Longitudinal Transverse
##        Slow     647.9987   435.2200
##        Fast     644.2663   460.0987
```

(e)

```r
# Need to create a function to call apply()
mean_diff = function(table) {
  return(table[[1]] - table[[2]])
}
# horizontal diff
apply(table_speed, 1, mean_diff)
```

```
##     Slow     Fast
## 212.7787 184.1675
```