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Question 1

The following is the code for the 1st question.

```
p_values <- c(0.0050, 0.0010, 0.0100, 0.0005, 0.0009, 0.0400, 0.0560, 0.0500,
0.0480, 0.0130, 0.0370, 0.0430, 0.0020, 0.0250, 0.1100, 0.0700, 0.0800)

p_values <- sort(p_values)

p_bonferroni <- p.adjust(p_values, method = "bonferroni", n =
length(p_values))

p_hochberg <- p.adjust(p_values, method = "hochberg", n = length(p_values))


print(p_values)
```

```
##  [1] 0.0005 0.0009 0.0010 0.0020 0.0050 0.0100 0.0130 0.0250 0.0370 0.0400
## [11] 0.0430 0.0480 0.0500 0.0560 0.0700 0.0800 0.1100
```

```
print(p_bonferroni)
```

```
##  [1] 0.0085 0.0153 0.0170 0.0340 0.0850 0.1700 0.2210 0.4250 0.6290 0.6800
## [11] 0.7310 0.8160 0.8500 0.9520 1.0000 1.0000 1.0000
```

```
print(p_hochberg)
```

```
##  [1] 0.0085 0.0144 0.0150 0.0280 0.0650 0.1100 0.1100 0.1100 0.1100 0.1100
## [11] 0.1100 0.1100 0.1100 0.1100 0.1100 0.1100 0.1100
```

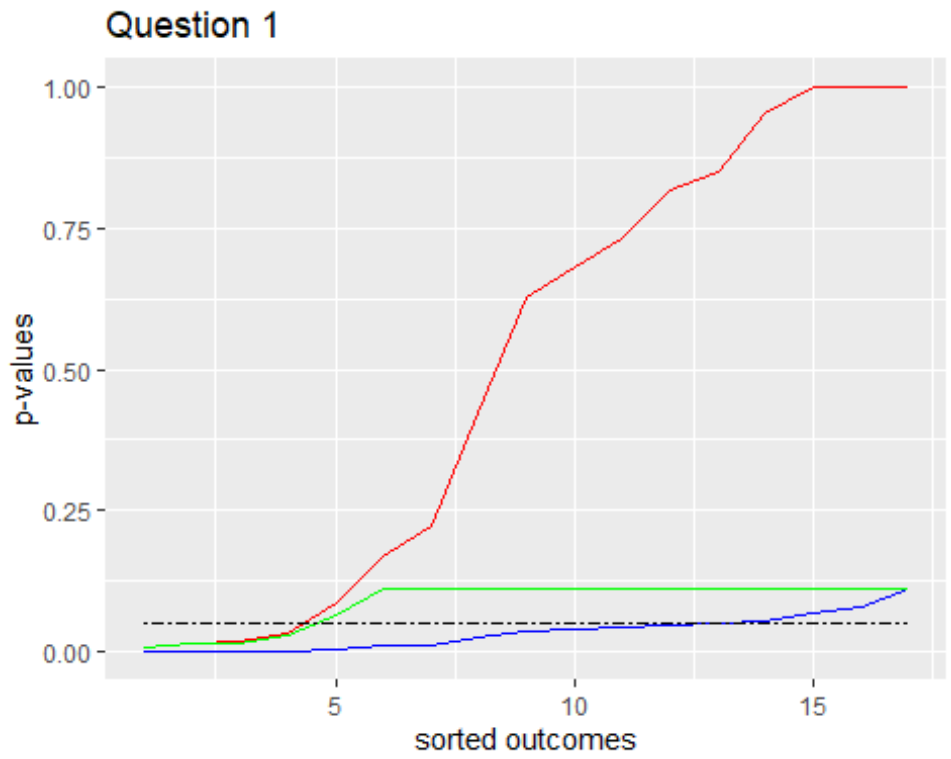
```
library(reshape2)
library(ggplot2)

data <- data.frame(x = c(1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15,
16, 17), y1 = p_values, y2 = p_bonferroni, y3 = p_hochberg, y4 = c(0.0500,
0.0500, 0.0500, 0.0500, 0.0500, 0.0500, 0.0500, 0.0500, 0.0500, 0.0500,
0.0500, 0.0500, 0.0500, 0.0500, 0.0500, 0.0500, 0.0500))

gfg_plot <- ggplot(data, aes(x)) +
    geom_line(aes(y = y1), color = "blue") +
     geom_line(aes(y = y2), color = "red") +
    geom_line(aes(y = y3), color = "green")+
    geom_line(aes(y = y4), color = "black", linetype = "twodash")+
```

```
labs(title="Question 1", x = "sorted outcomes", y = "p-values")

gfg_plot
```




```
#+geom_line(aes(color=c("Unadjusted", "Bonferroni", "Hochberg")))
```

The following is the inference from the graph: High adjusted p values for the aforementioned tests indicate a lack of support for an impact. Bonferroni adjustment is more stringent since it yields larger adjusted p values. Because it correlates to lower adjusted p values for the experiment than our alpha, the Benjamini-Hochberg adjustment is less rigorous.