

# Workshop 3 Solutions

*Veerasak Kritsanapraphan*

## 1. Data practice

In class we imported the survey data using the `read.table()` function.

This is the code we used:

```
survey <- read.csv("survey_data.csv", header=TRUE)
```

(a) How many survey respondents are from MISM or Other?

```
sum(survey$Program == "MISM" | survey[["Program"]] == "Other")
```

```
## [1] 16
```

(b) What % of survey respondents are from PPM?

```
100 * sum(survey$Program == "PPM") / nrow(survey)
```

```
## [1] 48.3871
```

## 2. Index practice

(a) Use `$` notation to pull the `OperatingSystem` column from the survey data

```
survey$OperatingSystem
```

```
## [1] Windows Windows Windows Windows Windows Mac OS X Mac OS X
## [8] Windows Mac OS X Windows Mac OS X Windows Mac OS X Mac OS X
## [15] Windows Mac OS X Windows Mac OS X Windows Windows Mac OS X
## [22] Windows Windows Mac OS X Mac OS X Mac OS X Mac OS X Windows
## [29] Mac OS X Windows Windows
## Levels: Mac OS X Windows
```

(b) Do the same thing with `[,]` notation, referring to `OperatingSystem` by name

```
survey[, "OperatingSystem"]
```

```
## [1] Windows Windows Windows Windows Windows Mac OS X Mac OS X
## [8] Windows Mac OS X Windows Mac OS X Windows Mac OS X Mac OS X
## [15] Windows Mac OS X Windows Mac OS X Windows Windows Mac OS X
## [22] Windows Windows Mac OS X Mac OS X Mac OS X Mac OS X Windows
## [29] Mac OS X Windows Windows
## Levels: Mac OS X Windows
```

(c) Repeat part (b), this time referring to `OperatingSystem` by column number

```
survey[, 4]
```

```
## [1] Windows Windows Windows Windows Windows Mac OS X Mac OS X
## [8] Windows Mac OS X Windows Mac OS X Windows Mac OS X Mac OS X
## [15] Windows Mac OS X Windows Mac OS X Windows Windows Mac OS X
## [22] Windows Windows Mac OS X Mac OS X Mac OS X Mac OS X Windows
## [29] Mac OS X Windows Windows
## Levels: Mac OS X Windows
```