

CodingChallenge6

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Question 1

The main point is simplify your code so that it's easy to use repeatably without error.

Question 2

A function must first be assigned a name and given the beginning of the input code such as the syntax below: `function_name <- function(variable) { body return(output) }`. You then add the code in the body and a return for what you want the output to do.

Question 3

```
library(tidyverse)
```

```
## -- Attaching core tidyverse packages ----- tidyverse 2.0.0 --
## v dplyr      1.1.4      v readr      2.1.5
## v forcats    1.0.0      v stringr   1.5.1
## v ggplot2    3.5.1      v tibble    3.2.1
## v lubridate  1.9.4      v tidyr     1.3.1
## v purrr      1.0.4
## -- Conflicts ----- tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()     masks stats::lag()
## i Use the conflicted package (<http://conflicted.r-lib.org/>) to force all conflicts to become errors
```

```
library(ggplot2)
Cities <- read.csv("Cities.csv")
```

Question 4

```
# convert to radians
dist_bet <- function(lat1, lon1, lat2, lon2){
  rad.lat1 <- lat1 * pi/180
```

```

rad.lon1 <- lon1 * pi/180
rad.lat2 <- lat2 * pi/180
rad.lon2 <- lon2 * pi/180
# Haversine formula
delta_lat <- rad.lat2 - rad.lat1
delta_lon <- rad.lon2 - rad.lon1
a <- sin(delta_lat / 2)^2 + cos(rad.lat1) * cos(rad.lat2) * sin(delta_lon / 2)^2
c <- 2 * asin(sqrt(a))
# Earth's radius in kilometers
earth_radius <- 6378137
# Calculate the distance
distance_km <- (earth_radius * c)/1000
return(distance_km)
}

```

Question 5

```

Cities_subset <- subset(Cities, city %in% c("New York", "Auburn"), select = c(long, lat))
print(Cities_subset)

```

```

##           long      lat
## 1   -73.9249  40.6943
## 40  -85.4903  32.6087

```

```

nyc_auburn <- dist_bet(40.6943, -73.9249, 32.6087, -85.4903)
print(nyc_auburn)

```

```

## [1] 1367.854

```

Question 6

```

dist_all <- NULL
for (i in 1:nrow(Cities)){
  distance_i <- dist_bet(Cities$lat[i], Cities$long[i], 32.6087, -85.4903)
  dist_all <- rbind.data.frame(dist_all, distance_i)
}

print(dist_all)

```

```

##      X1367.85395084397
## 1           1367.8540
## 2           3051.8382
## 3           1045.5213
## 4            916.4138
## 5            993.0298
## 6           1056.0217

```

## 7	1239.9732
## 8	162.5121
## 9	1036.9900
## 10	1665.6985
## 11	2476.2552
## 12	1108.2288
## 13	3507.9589
## 14	3388.3656
## 15	2951.3816
## 16	1530.2000
## 17	591.1181
## 18	1363.2072
## 19	1909.7897
## 20	1380.1382
## 21	2961.1199
## 22	2752.8142
## 23	1092.2595
## 24	796.7541
## 25	3479.5376
## 26	1290.5492
## 27	3301.9923
## 28	1191.6657
## 29	608.2035
## 30	2504.6312
## 31	3337.2781
## 32	800.1452
## 33	1001.0879
## 34	732.5906
## 35	1371.1633
## 36	1091.8970
## 37	1043.2727
## 38	851.3423
## 39	1382.3721
## 40	0.0000

Question 7

I forgot how to link it.