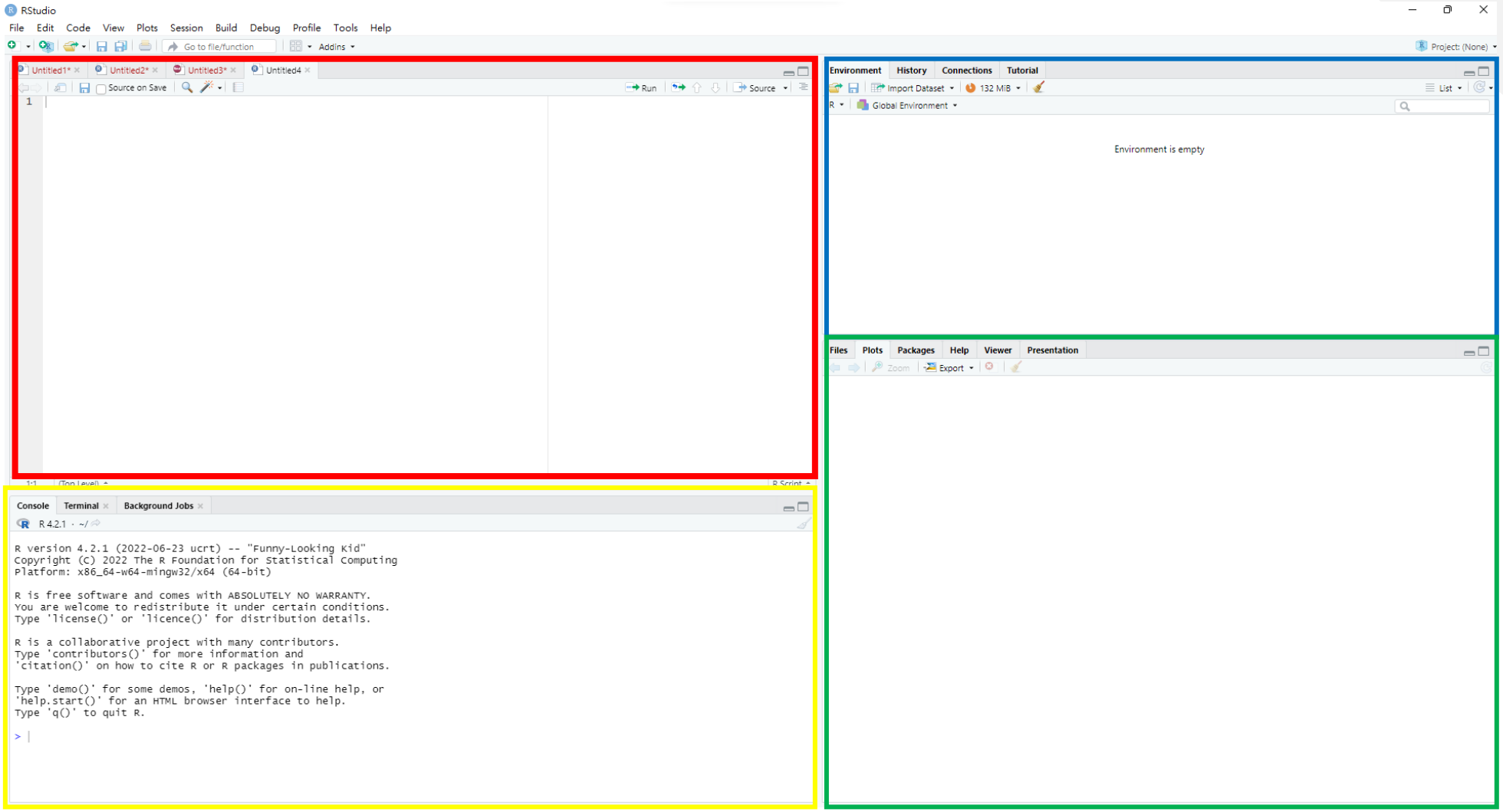
R：Statistical Programming Methods
R：程式、機率與統計

Basic R Language and Introduction to R studio

How R studio looks Like



Let’s getting started

```
x <- 1
x
```

What you type on the scripts (red box)

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

What appear in the console (yellow box)

Define new variables

```
msg <- "hello"; msg
## [1] "hello"
```

Sequences

```
2:12
##  [1]  2  3  4  5  6  7  8  9 10 11 12
y<- 2:12; y
##  [1]  2  3  4  5  6  7  8  9 10 11 12
```

Variable Forms

```r
x1 <- c(0.5, 0.6)          #numeric
x2 <- c(TRUE, FALSE)       #logical
X3 <- c(T, F)
x4 <- c("a", "b", "c")     #character
```

Matrix -1

```
matrix(nrow=3, ncol=2)
##      [,1] [,2]
## [1,]   NA   NA
## [2,]   NA   NA
## [3,]   NA   NA
m1 <- matrix(nrow=3, ncol=2)
dim(m1) #dimension
## [1] 3 2
```

Matrix -2

```
m2 <- matrix(1:6, nrow=3)

#what's wrong with this one?
dimnames(m2) <- list(c("a", "b"), c("y","z"))


dimnames(m2) <- list(c("a", "b", "c"), c("y","z"))
m2
##   y z
## a 1 4
## b 2 5
## c 3 6
```

Matrix -3

```
m3 <- 1:10
dim(m3) <- c(2,5)
m3
```

```
##      [,1] [,2] [,3] [,4] [,5]
## [1,]    1    3    5    7    9
## [2,]    2    4    6    8   10
```

```
rownames(m3) <- (c("h", "f"))
#how about colnames?
m3
```

```
##   [,1] [,2] [,3] [,4] [,5]
## h    1    3    5    7    9
## f    2    4    6    8   10
```

Matrix -4

```
x <- 1:3
y <- 10:12
cbind(x,y)        #column bind
##       x  y
## [1,] 1 10
## [2,] 2 11
## [3,] 3 12
rbind(x,y)        #row bind
##   [,1] [,2] [,3]
## x    1    2    3
## y   10   11   12
```

Determine NA (Not Available)

```
x5 <- c(1, 2, NA, 10, 3)
is.na(x5)

## [1] FALSE FALSE  TRUE FALSE FALSE

sum(is.na(x5))              #checking how many NAs

## [1] 1
```

Data Frames

```
#data.frames
d1 <- data.frame(year=1:5, bar=c(T, T, T, F, F))
nrow(d1)
```

```
## [1] 5
```

```
#how about columns?
```