

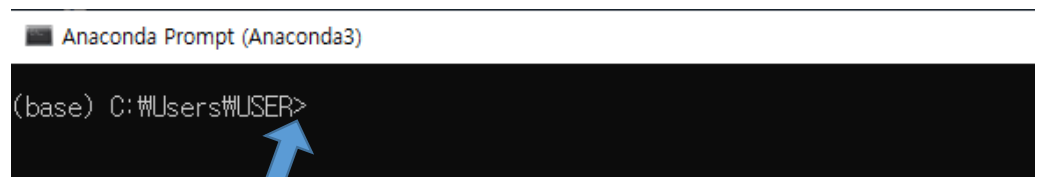
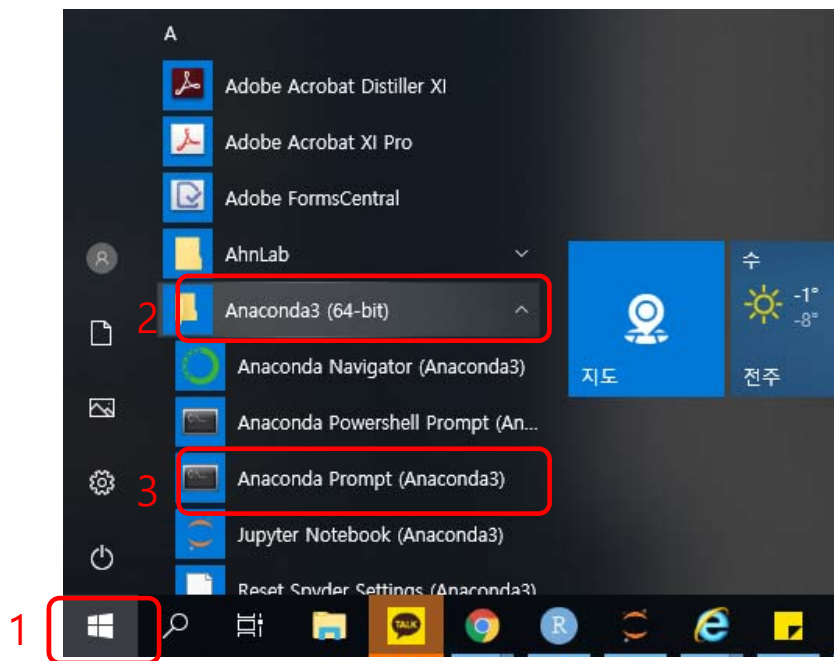
Jupyter Notebook 사용 기초

2021 가을학기

생물통계학

참고

- Anaconda를 download 하면 Jupyter Notebook 사용 가능
- Jupyter Notebook과 R을 연동시키려면 추가 작업 필요.
- Windows 로고 키 -> Anaconda 앱 -> Anaconda Prompt 선택 -> 명령어 입력



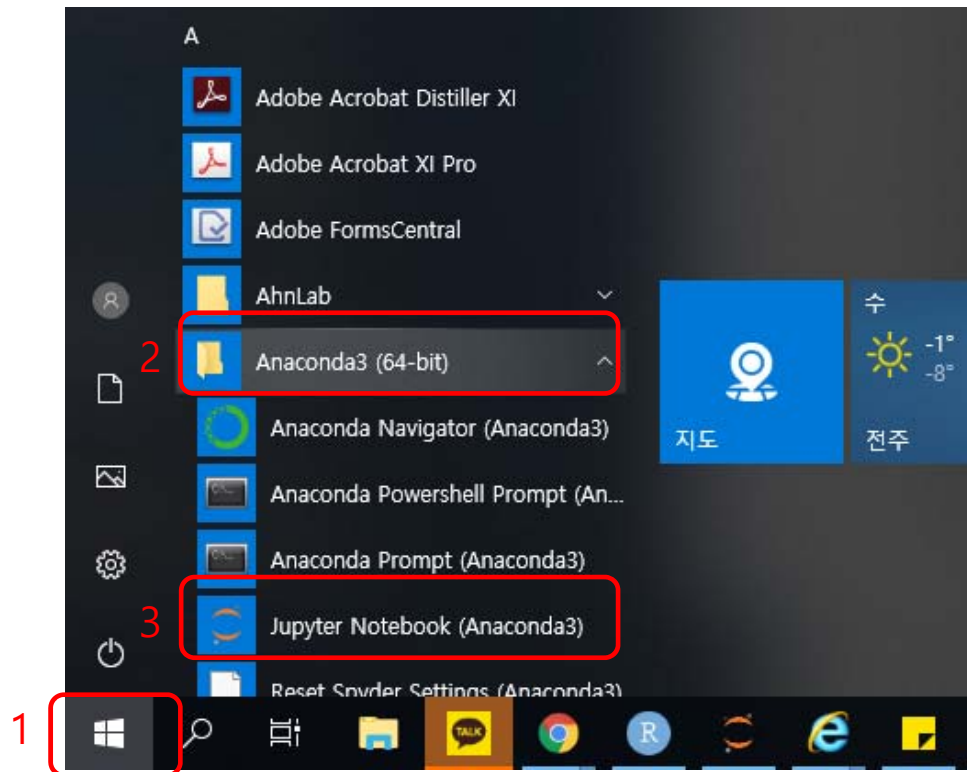
4 입력

conda create -n my-r-env -c r r-essentials

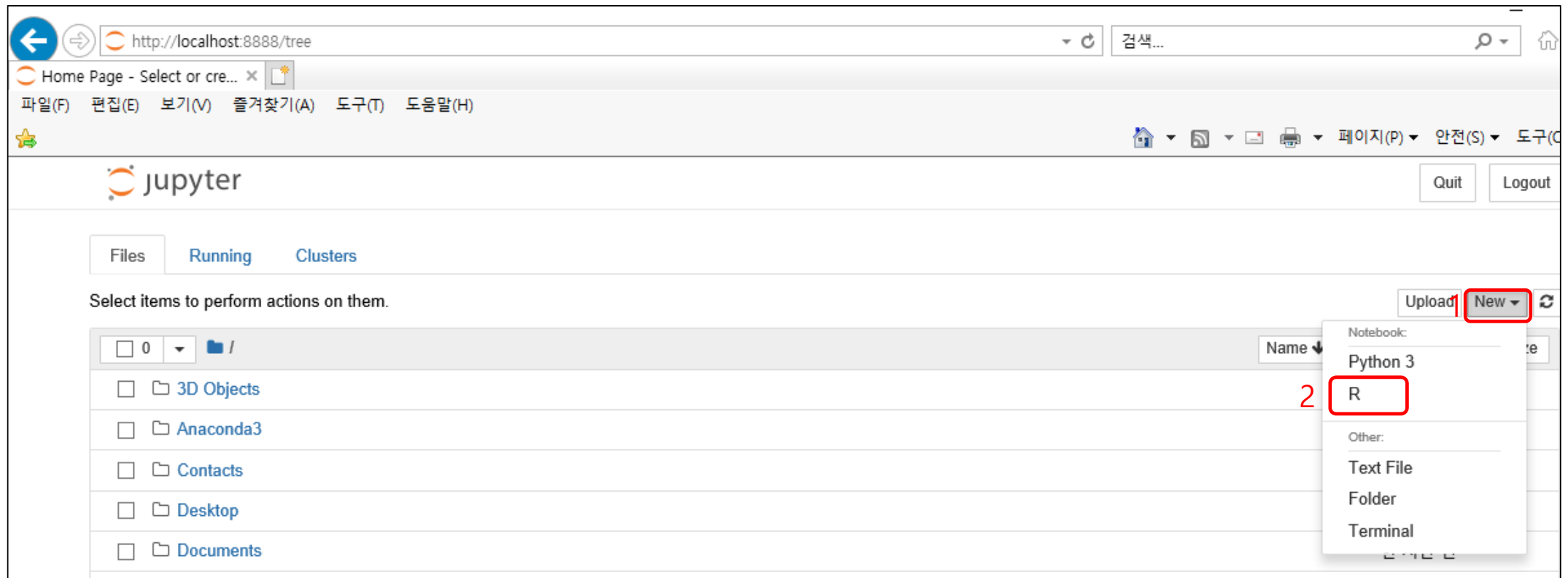
▣ 각 컴퓨터 환경에 따라 Jupyter Notebook과 R을 연동 방법이 다를 수 있음
여기 소개된 방법으로 연동이 안 된다면 구글링해서 다른 방법을 찾아 시도

Jupyter Notebook 시작

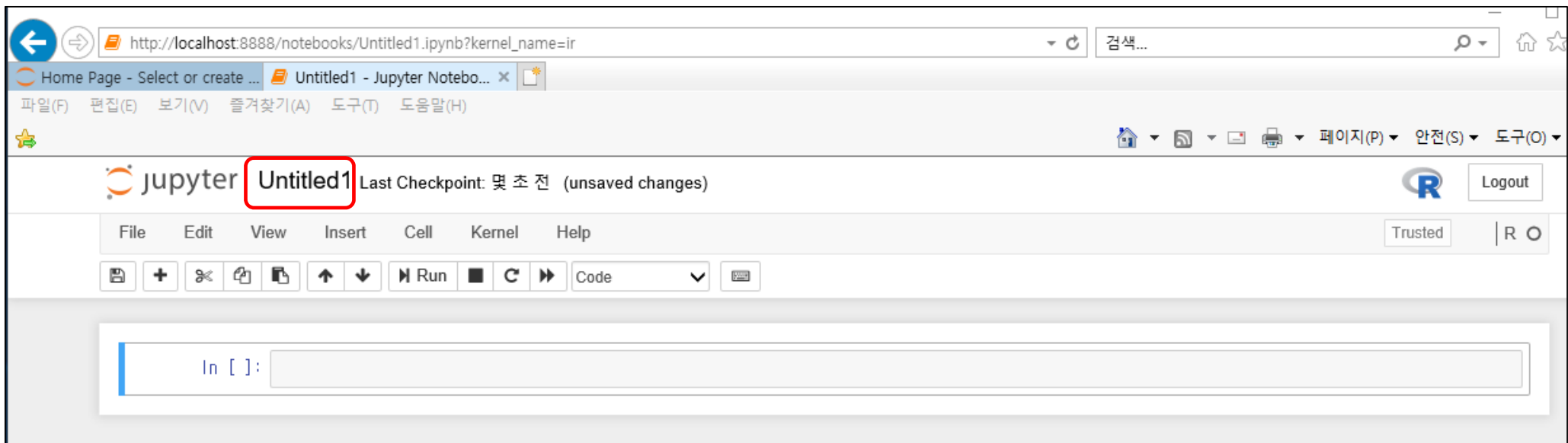
- Windows 로고 키 -> Anaconda 앱 -> Jupyter Notebook 선택



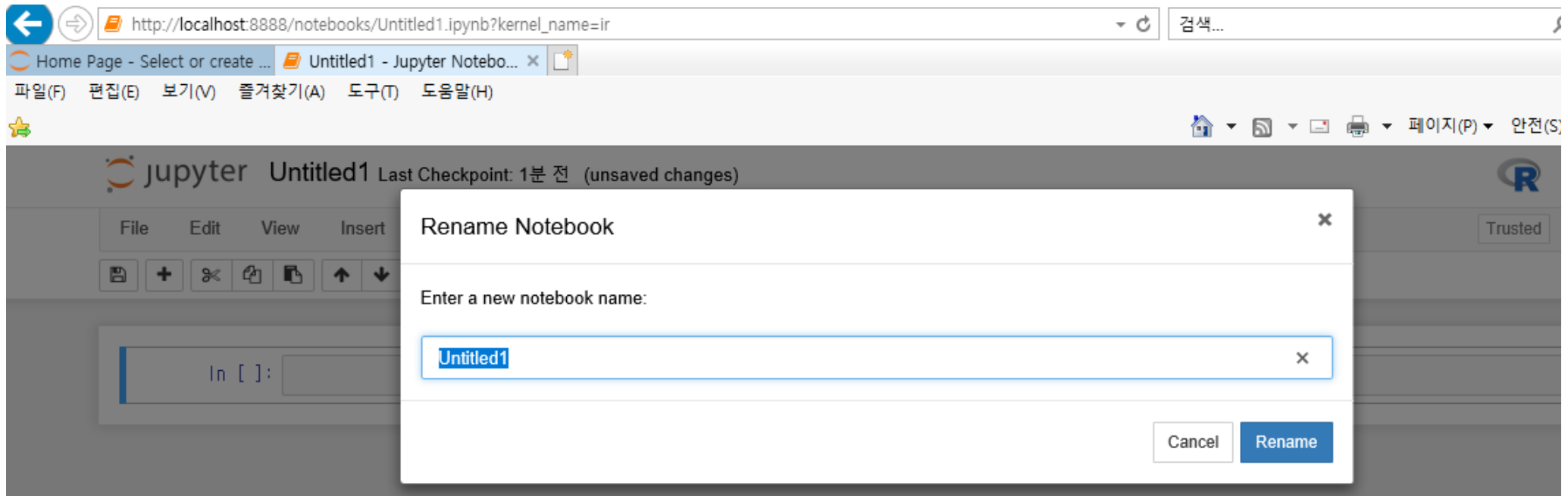
- 다음과 같은 창이 생성됨
- 새로운 R문서 작업을 위해 New를 클릭한 후 R을 선택



- Untitled1이라는 문서 편집창이 나타남



- Untitled1를 클릭하면 Notebook 이름을 변경할 수 있음

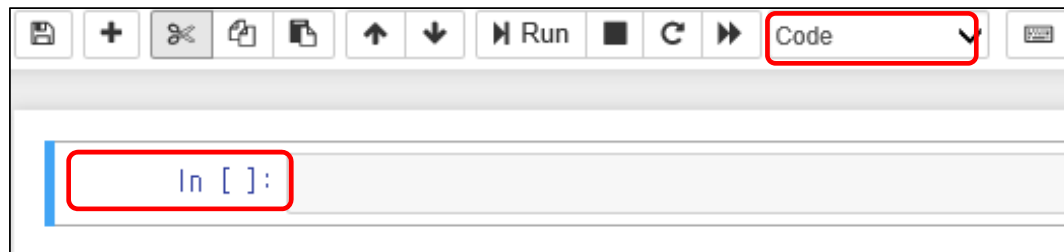


- IntroJNB로 Rename하였음

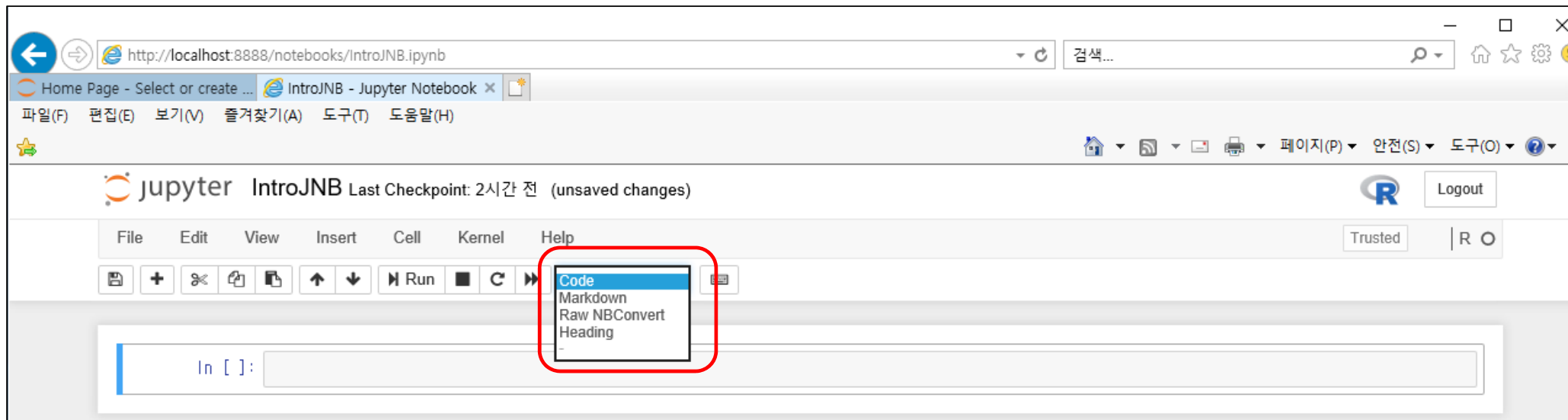


- Cells

- Code cell : R code
- Markdown cell : Markdown 문법을 따르는 텍스트



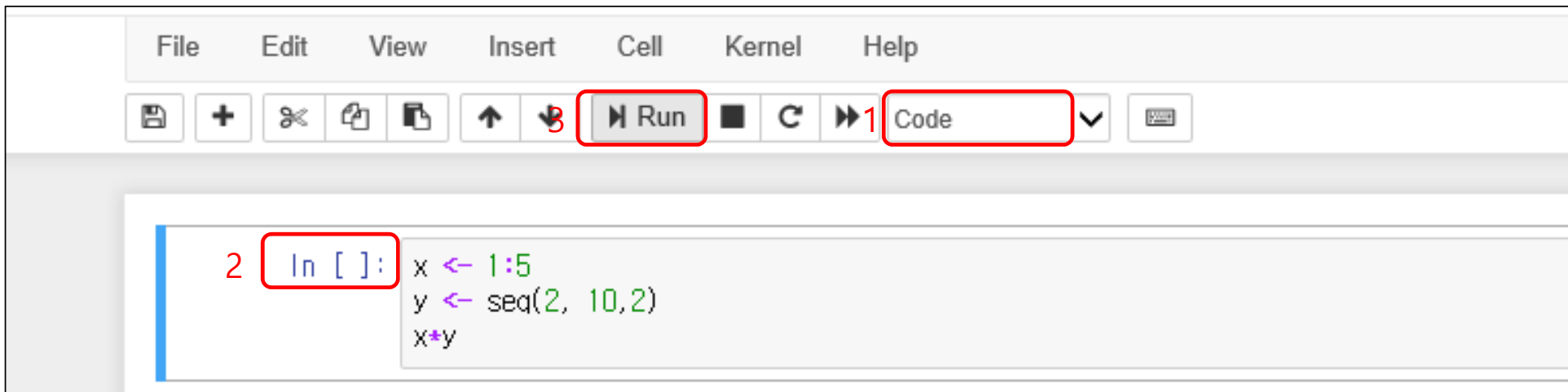
- Cells
 - Code cell (default)



- Code cell 실행

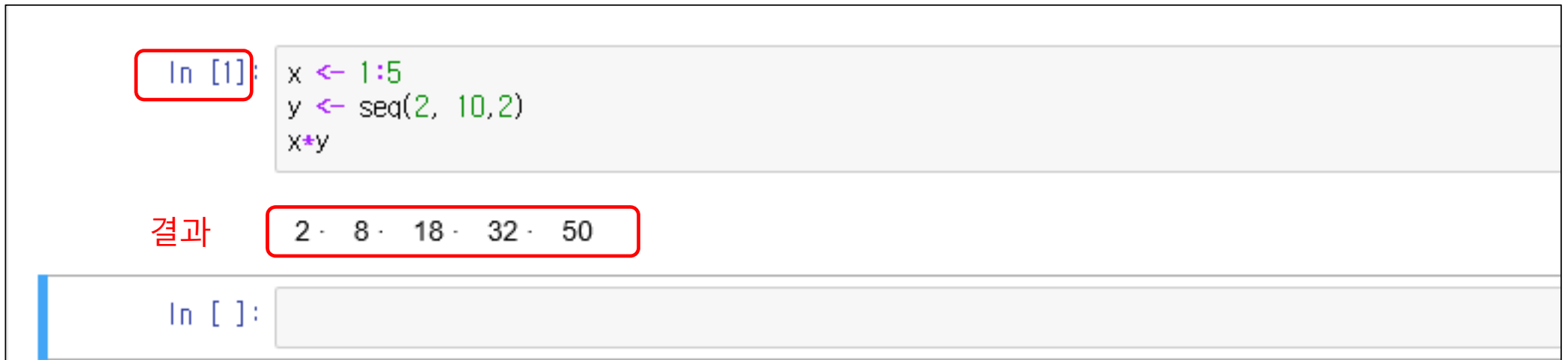
Code 선택 (default) -> Code cell에 R Code 입력

-> Run 클릭 또는 Shift (Ctrl) + Enter



- Code cell `In []`

- `In` : Input 의미
- 코드를 Run 또는 Shift (또는 Ct기) + Enter로 실행하면
 `[]` 에 번호가 생성되고
 code cell 아래에 output이 나타남

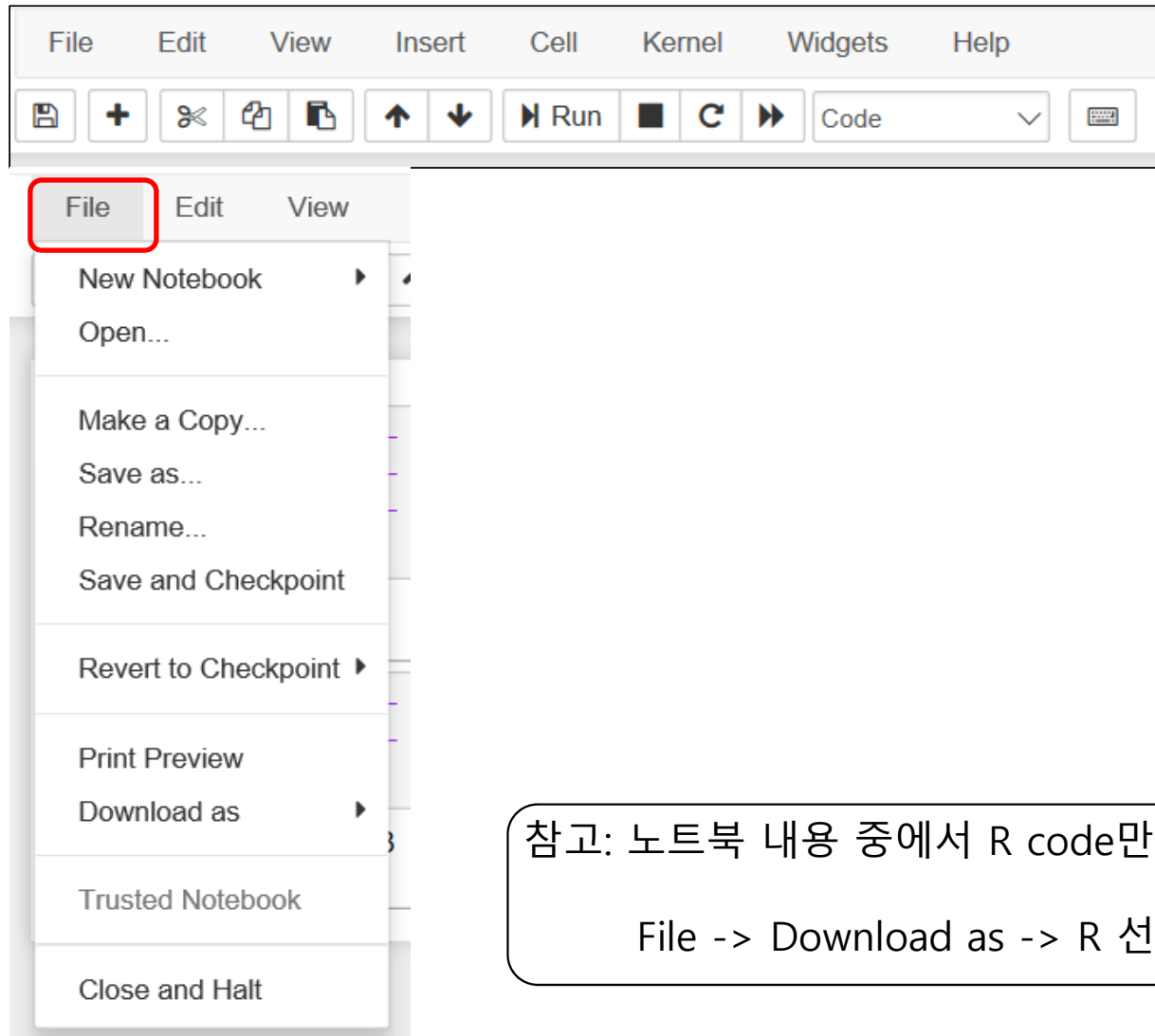


The screenshot shows a Jupyter Notebook interface. The top cell is a code cell with the prompt `In [1]:` highlighted by a red box. The code inside the cell is:

```
x <- 1:5  
y <- seq(2, 10, 2)  
x*y
```

The bottom cell is an empty code cell with the prompt `In []:`. Between the two cells, the word "결과" (Result) is written in red. To its right, the output of the code cell is displayed: `2 · 8 · 18 · 32 · 50`, which is also enclosed in a red box.

- menu와 toggle bar 활용

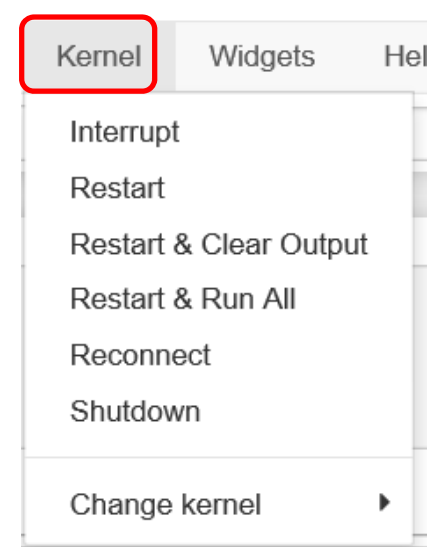
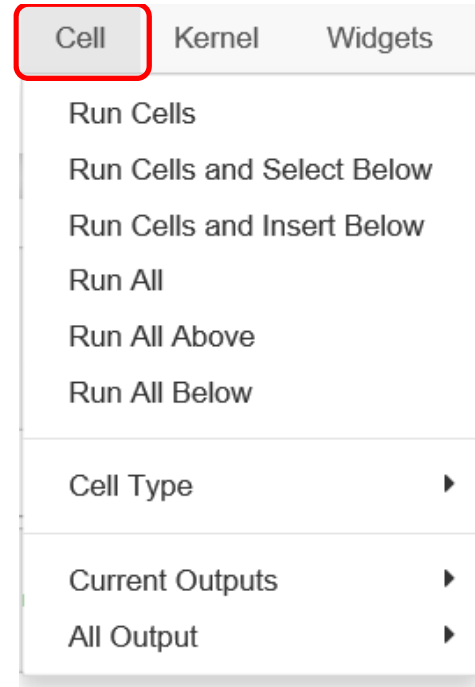
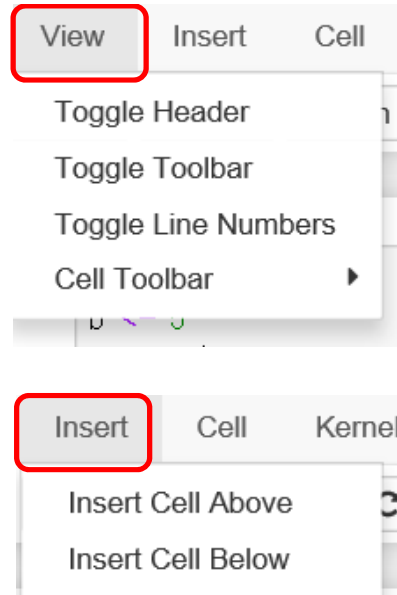
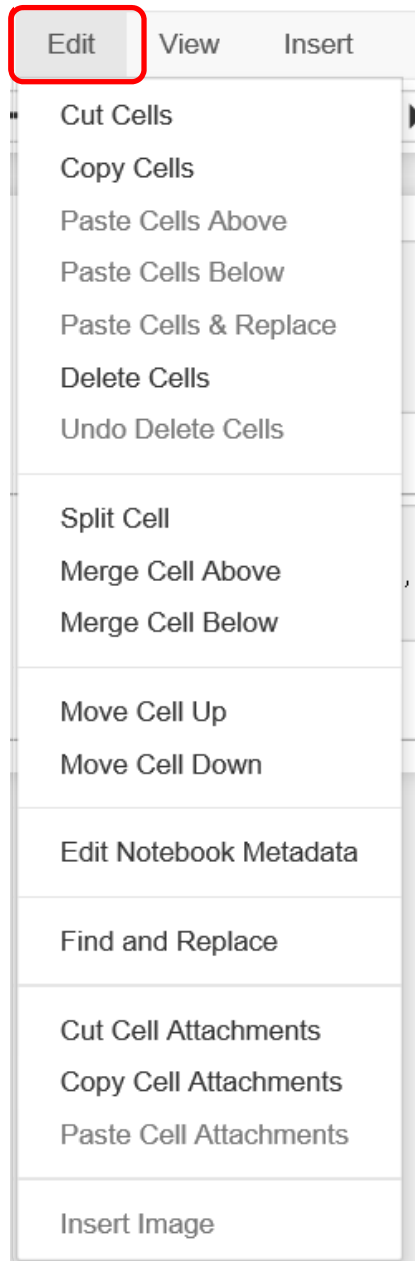


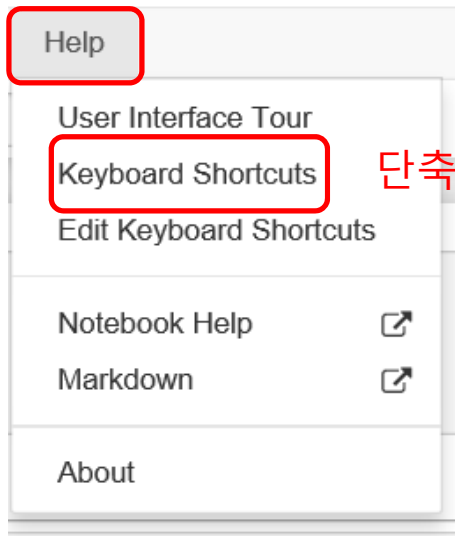
메뉴

Toggle bar

참고: 노트북 내용 중에서 R code만 download 하고 싶은 경우

File -> Download as -> R 선택





Keyboard shortcuts

The Jupyter Notebook has two different keyboard input modes. **Edit mode** allows you to type code or text into a cell and is indicated by a green cell border. **Command mode** binds the keyboard to notebook level commands and is indicated by a grey cell border with a blue left margin.

Command Mode (press `Esc` to enable)

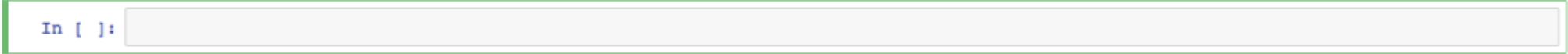
Edit Shortcuts

<code>F</code> : find and replace	<code>Shift-Down</code> : extend selected cells below
<code>Ctrl-Shift-F</code> : open the command palette	<code>Shift-J</code> : extend selected cells below
<code>Ctrl-Shift-P</code> : open the command palette	<code>A</code> : insert cell above
<code>Enter</code> : enter edit mode	<code>B</code> : insert cell below
<code>P</code> : open the command palette	<code>X</code> : cut selected cells
<code>Shift-Enter</code> : run cell, select below	<code>C</code> : copy selected cells
<code>Ctrl-Enter</code> : run selected cells	<code>Shift-V</code> : paste cells above
<code>Alt-Enter</code> : run cell and insert below	<code>V</code> : paste cells below
<code>Y</code> : change cell to code	<code>Z</code> : undo cell deletion
<code>M</code> : change cell to markdown	<code>D</code> , <code>D</code> : delete selected cells
<code>R</code> : change cell to raw	<code>Shift-M</code> : merge selected cells, or current cell with cell below if only one cell is selected
<code>1</code> : change cell to heading 1	<code>Ctrl-S</code> : Save and Checkpoint
<code>2</code> : change cell to heading 2	<code>S</code> : Save and Checkpoint
<code>3</code> : change cell to heading 3	
<code>4</code> : change cell to heading 4	

Close

Jupyter Notebook cell mode






- Edit mode – 테두리와 막대가 초록색
cell 안을 마우스 클릭하거나 Enter 키로 Edit mode
cell 편집가능


A screenshot of a Jupyter Notebook cell in Edit mode. The cell has a green border and a green bar on the left. The text 'In []:' is visible in the top left corner of the cell.

- Command mode – 회색 테두리와 파란색 막대
cell 밖을 마우스 클릭하거나 Esc 키로 Command mode
cell 편집 불가하나 노트북 편집가능
















A screenshot of a Jupyter Notebook cell in Command mode. The cell has a gray border and a blue bar on the left. The text 'In []:' is visible in the top left corner of the cell.

Kernel Widgets Help

   Code  



jupyter-notebook command group

automatically indent selection	
change cell to code	(command mode) 
change cell to heading 1	(command mode) 
change cell to heading 2	(command mode) 
change cell to heading 3	(command mode) 
change cell to heading 4	(command mode) 
change cell to heading 5	(command mode) 
change cell to heading 6	(command mode) 
change cell to markdown	(command mode) 
change cell to raw	(command mode) 
clear all cells output	
clear cell output	
close the pager	(command mode) 
 confirm restart kernel	(command mode)  , 
confirm restart kernel and clear output	
 confirm restart kernel and run all cells	
 confirm shutdown kernel	

Jupyter Notebook 필수 단축키

먼저 **Esc** 키를 누른 후

- A : 현재 셀 위에 새로운 셀 추가
- B : 현재 셀 밑에 새로운 셀 추가
- M : 현재 셀을 code 셀에서 markdown 셀로 변경
- Y : markdown 셀을 code 셀로 변경
- DD : 셀 삭제
- Enter: command 모드에서 edit 모드로 변경
- F : 코드를 find and replace
- O : output 접기
- R : output 삭제
- Shift+M : 셀 MERGE


```
In [ ]: a <- 3  
        b <- 5  
        c <- a+b  
        c
```

```
In [ ]: x <- 1:5  
        y <- seq(2,10,2)  
        x*y
```

- Cell 추가, 삭제, 이동
- Code 실행
- Output 숨기기, 지우기
- Code line number 생성
- 재실행
- Notebook 저장, R code만 저장

Markdown 문법

실행 : Shift+Enter (Run 또는 Ctrl+Enter)

제목 : #의 개수에 따라 글자 크기 달라짐 (6개까지 가능)

1 예제
2 예제
3 예제

1 예제

2 예제

3 예제

Markdown 문법

강조

글자 앞 뒤에 * 또는 _ 붙이면 이탤릭체(기울어진 글자체)

글자 앞 뒤에 ** 또는 __ 붙이면 굵은 글자체

글자 앞 뒤에 ~~ 붙이면 취소선이 그어진 글자

글자체
****글자체****
글자체
__글자체__
~~~~글자체~~~~

*글자체*  
**글자체**  
*글자체*  
**글자체**  
~~글자체~~

# Markdown 문법

**줄바꿈** : Space 키 두 번 + Enter

첫번째  
두번째

Space 없이 Enter만으로 줄바꾸기 했을 때

첫번째 두번째

Space 두 번 후 Enter 로 줄바꾸기 했을 때

첫번째  
두번째

**수평선** : \* 또는 \_를 여러 번 반복

\*\*\*

\* \* \*

—

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# Markdown 문법

**목록 :** 숫자 (순서있는 목록) , 글머리 기호(+, - : 순서없는 목록) 뒤를

Space 키로 한 칸 띄기

목록 안에 목록은 Tab으로 한 번 띄어주기

1. 첫번째  
2. 두번째

1. 첫번째  
2. 두번째

+ 첫번째  
+ 두번째  
  
- 첫번째  
- 두번째

- 첫번째
- 두번째
- 첫번째
- 두번째

+ 첫번째  
+ 두번째  
+ 세번째

- 첫번째
  - 두번째
    - 세번째