

Programming-MATLAB

| P r a c t i c e c l a s s c o u r s e |

1. Enter the address <ftp://ftp.korea.ac.kr> in your web browser.
2. Click the directory MATLAB/
3. Choose appropriate R2017a.egg depending on your OS.
4. Download it.
5. During downloading, go to www.mathworks.com and create an account.
6. create an account [*your ID*@korea.ac.kr]
7. Get a license key

/의 색인

이름	크기	수정된 날짜
Acronis(backup_Recovery Program)/		15. 11. 3. 오전 9:00:00
Adobe/		16. 3. 30. 오전 9:00:00
AntiVirus(ALYac)/		16. 7. 28. 오전 9:00:00
ESTsoft Software/		17. 10. 24. 오전 9:00:00
Hangul/		17. 12. 20. 오전 9:00:00
IPIN_Infomation/		15. 9. 22. 오전 9:00:00
KoreaUNIV_YoonSeo_Font_ttf.zip	373 MB	15. 9. 22. 오전 9:00:00
MATLAB/		18. 5. 2. 오후 12:54:00
SAS/		18. 9. 7. 오후 12:58:00
SPSS/		18. 10. 4. 오후 1:02:00
Virtual_KU/		15. 9. 22. 오전 9:00:00
Windows 10 upgrade guide(only student)/		17. 5. 24. 오전 9:00:00
Wireless_LAN/		17. 11. 21. 오전 9:00:00
eStream Presto/		15. 9. 22. 오전 9:00:00
ip/		15. 9. 22. 오전 9:00:00
개인정보보호법_자료실(2011년9월30일시행)/		15. 9. 22. 오전 9:00:00
교육과학기술부_보안서버구축_메뉴얼/		18. 4. 3. 오전 9:00:00

/MATLAB/의 색인

[상위 디렉토리]

이름	크기	수정된 날짜
MATLAB_InstallGuide_May18.pdf	3.6 MB	18. 5. 2. 오후 12:54:00
R2016a(MAC).egg	7.0 GB	16. 11. 15. 오전 9:00:00
R2016a(Windows).egg	7.5 GB	16. 11. 15. 오전 9:00:00
R2016a(linux).egg	7.3 GB	16. 11. 15. 오전 9:00:00
R2016b(MAC).egg	7.6 GB	16. 11. 18. 오전 9:00:00
R2016b(Windows).egg	8.1 GB	16. 11. 18. 오전 9:00:00
R2016b(linux).egg	7.9 GB	16. 11. 18. 오전 9:00:00
R2017a(Linux).egg	9.5 GB	17. 5. 10. 오전 9:00:00
R2017a(Mac).egg	10.0 GB	17. 5. 10. 오전 9:00:00
R2017a(Windows).egg	9.7 GB	17. 5. 10. 오전 9:00:00
Update_License.pdf	1.4 MB	16. 5. 31. 오전 9:00:00
installation_matlab_linux_tah_dc_korea_university.pdf	170 kB	15. 9. 23. 오전 9:00:00
installation_matlab_mac_tah_dc_korea_university.pdf	192 kB	15. 9. 23. 오전 9:00:00
installation_matlab_win_tah_dc_korea_university.pdf	2.1 MB	15. 9. 23. 오전 9:00:00

https://kr.mathworks.com/mwaccount/register

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MathWorks® 제품 솔루션 대학 커리큘럼 지원 커뮤니티 이벤트

MathWorks 계정 Search MathWorks.com

MathWorks 계정 생성하기

이메일 주소

위치

MathWorks 소프트웨어를 어떻게 사용하실 계획입니까?

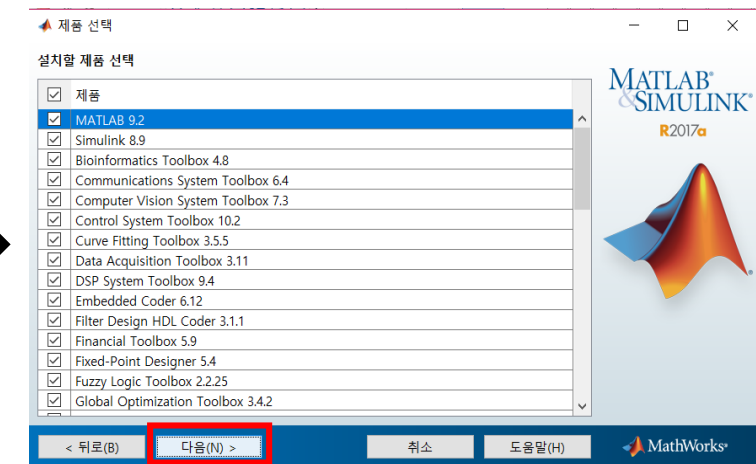
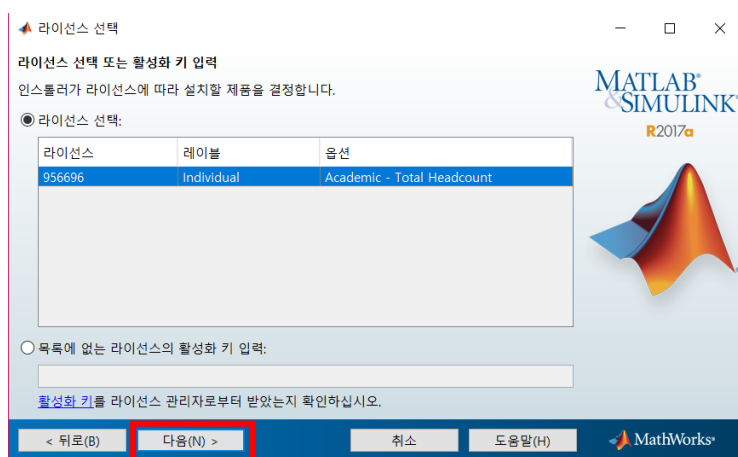
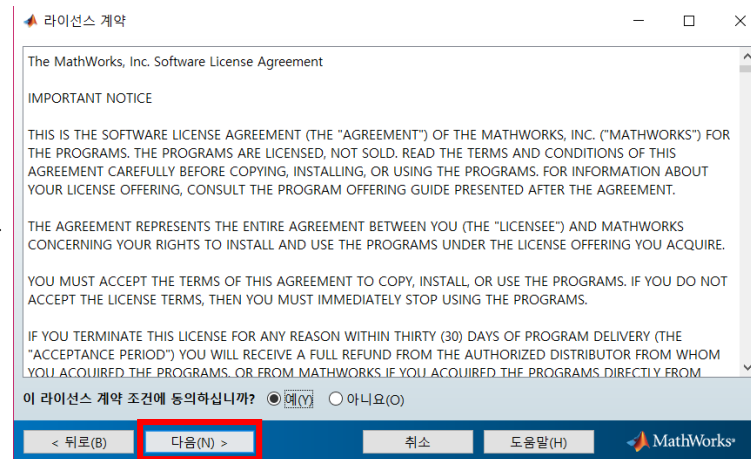
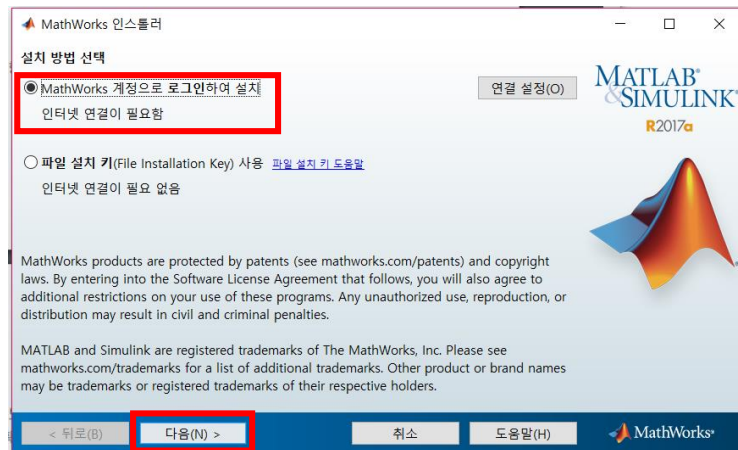
13세 이상입니까? ☒ 예 ☐ 아니요

1. Install MATLAB

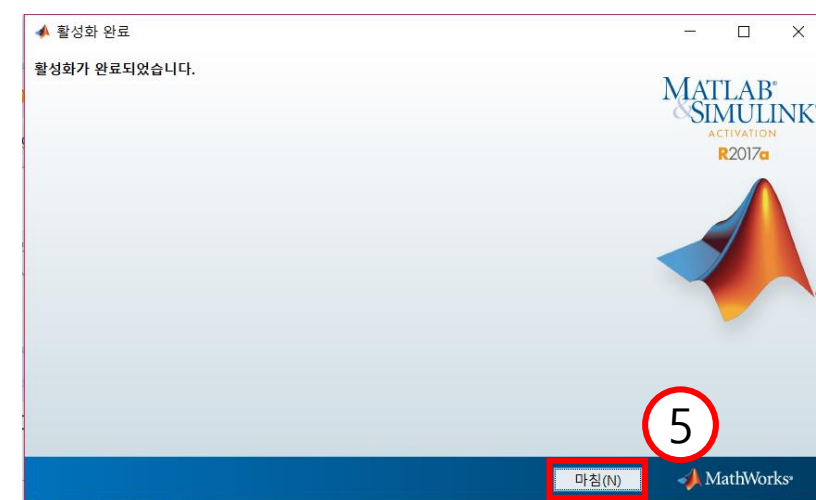
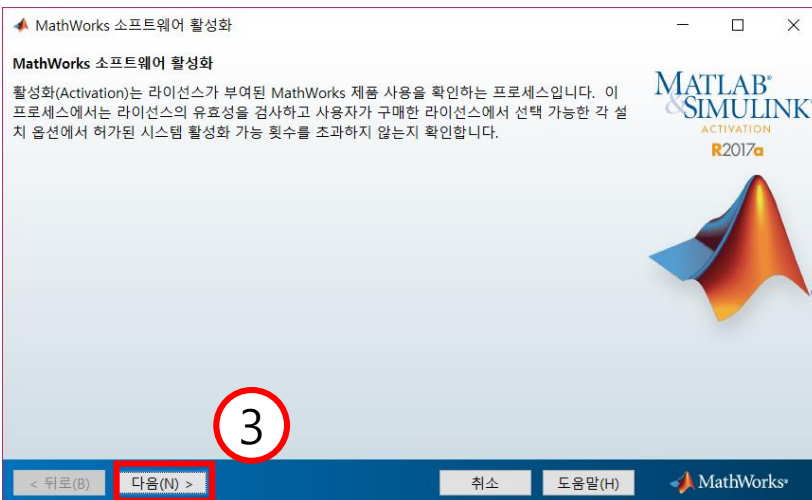
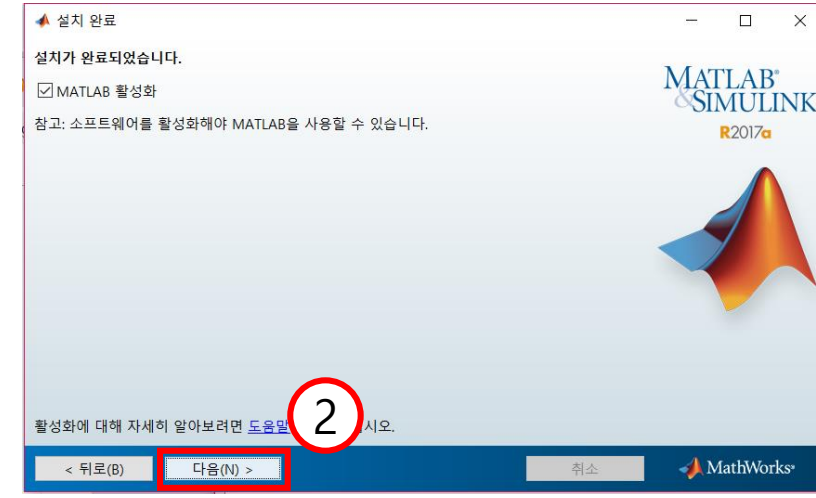
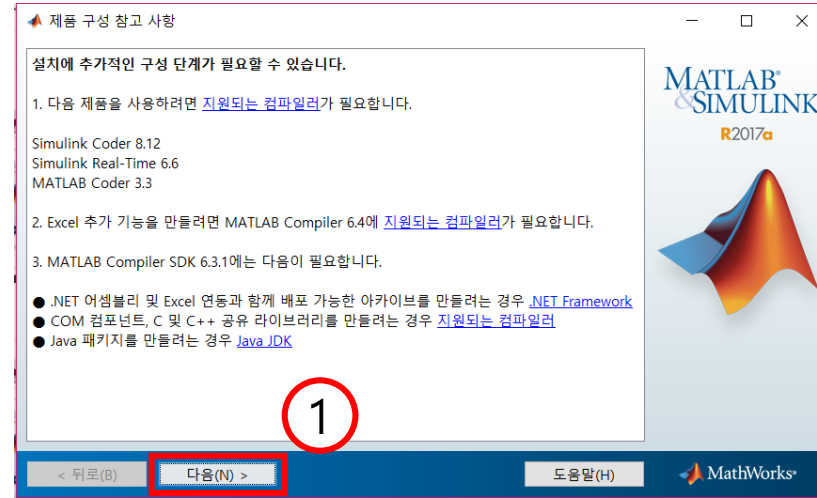
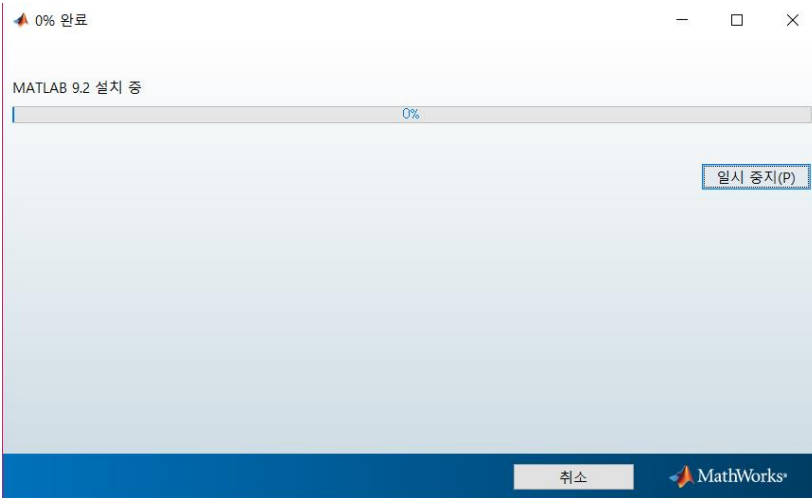
Class 4

Programming - C

1. Unzip R2017a.egg and double click 'setup'
2. Choose 'install using the internet'
3. Fill in the blanks
4. Click next



1. Install MATLAB

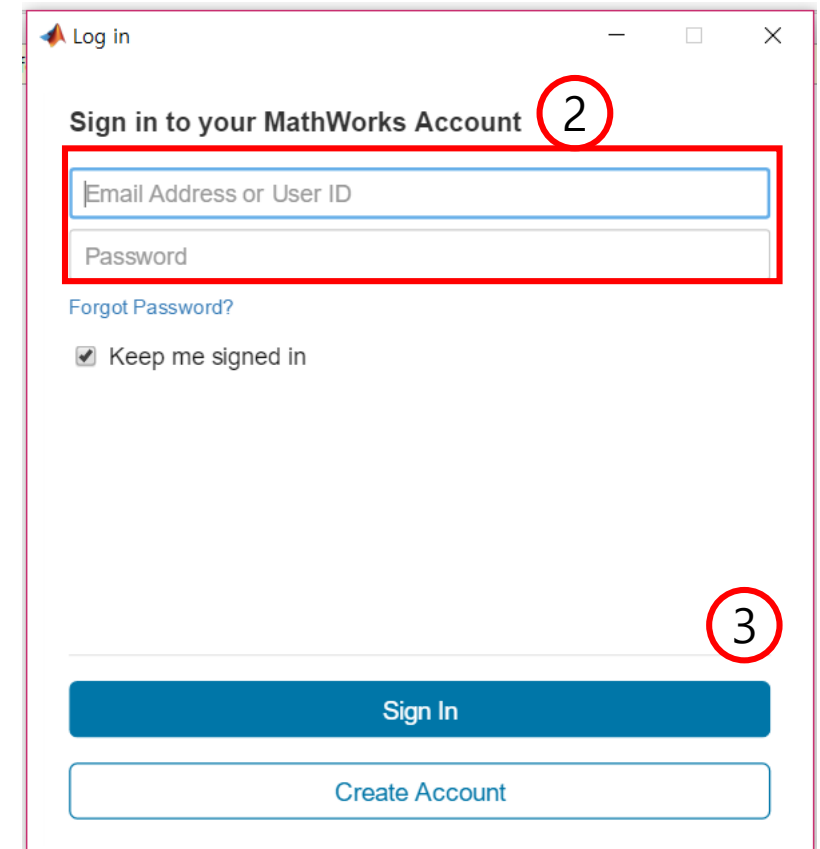
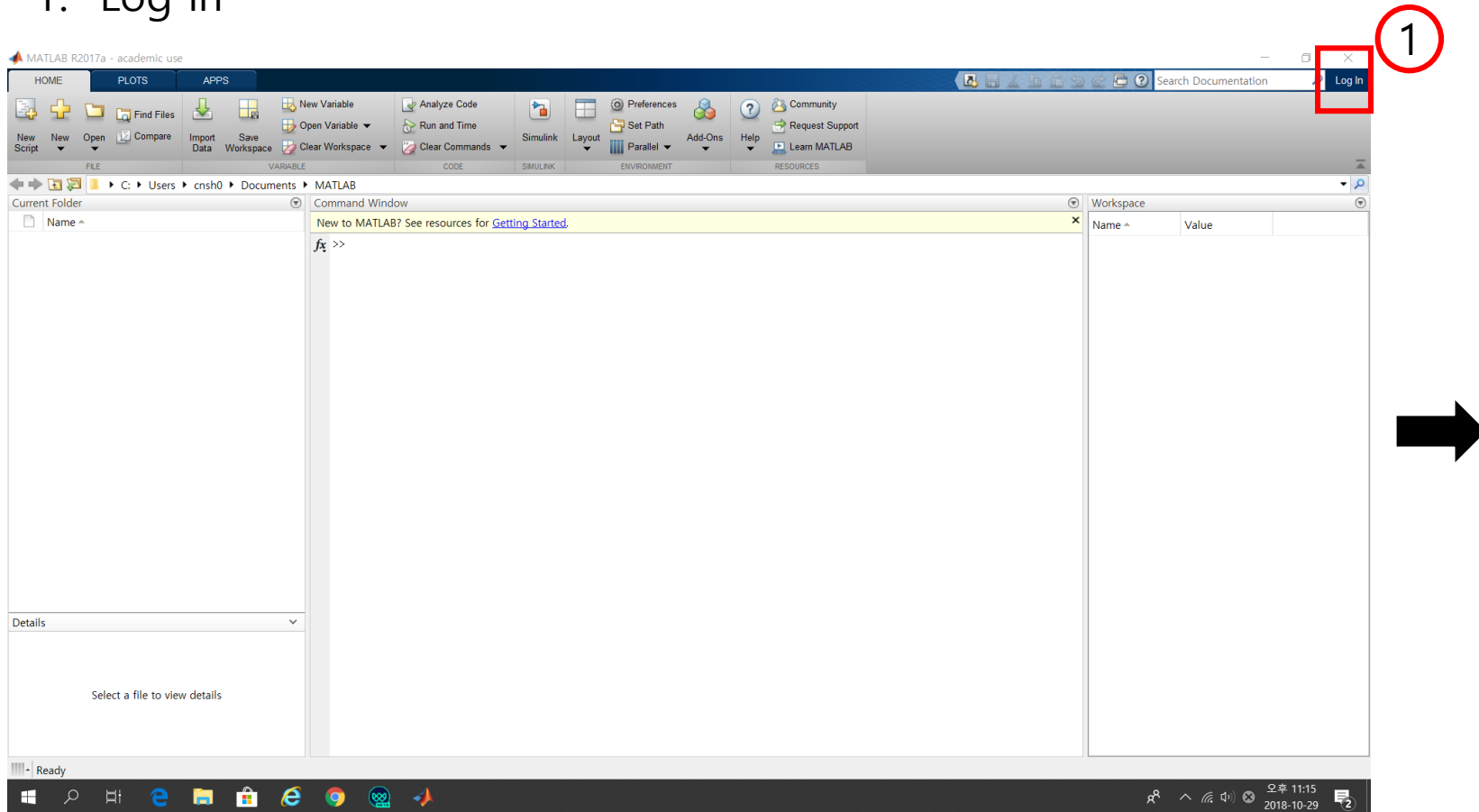


2. Make a new script file

Class 4

Programming - C

1. Log in



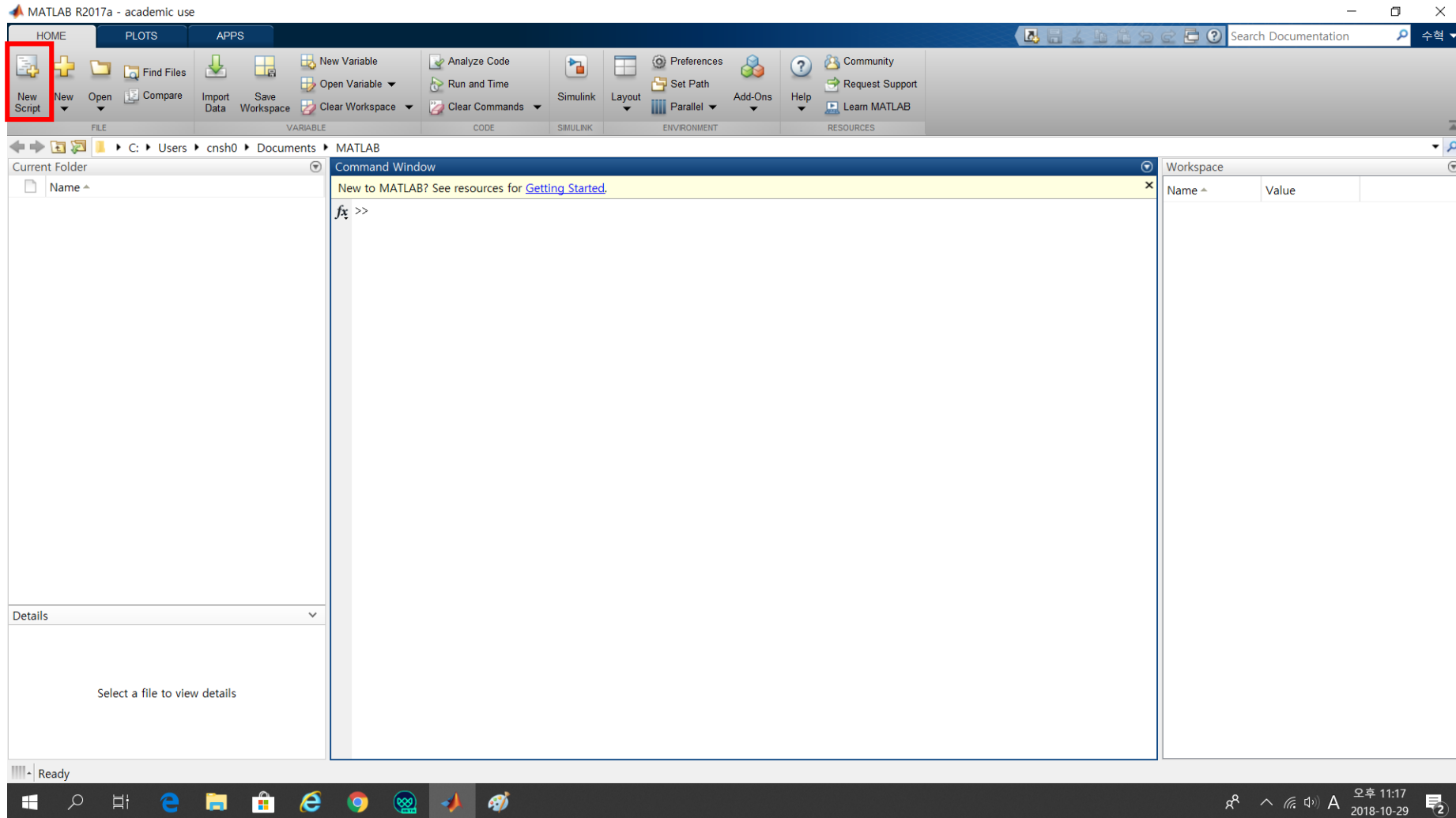
The image shows the MathWorks login dialog box. The title is 'Log in'. The main heading is 'Sign in to your MathWorks Account', which is labeled with a circled '2'. Below the heading are two input fields: 'Email Address or User ID' and 'Password'. A link for 'Forgot Password?' is visible. There is a checkbox labeled 'Keep me signed in'. At the bottom, there is a blue 'Sign In' button, labeled with a circled '3', and a 'Create Account' button.

2. Make a new script file

Class 4

Programming - C

1. Make a new script file



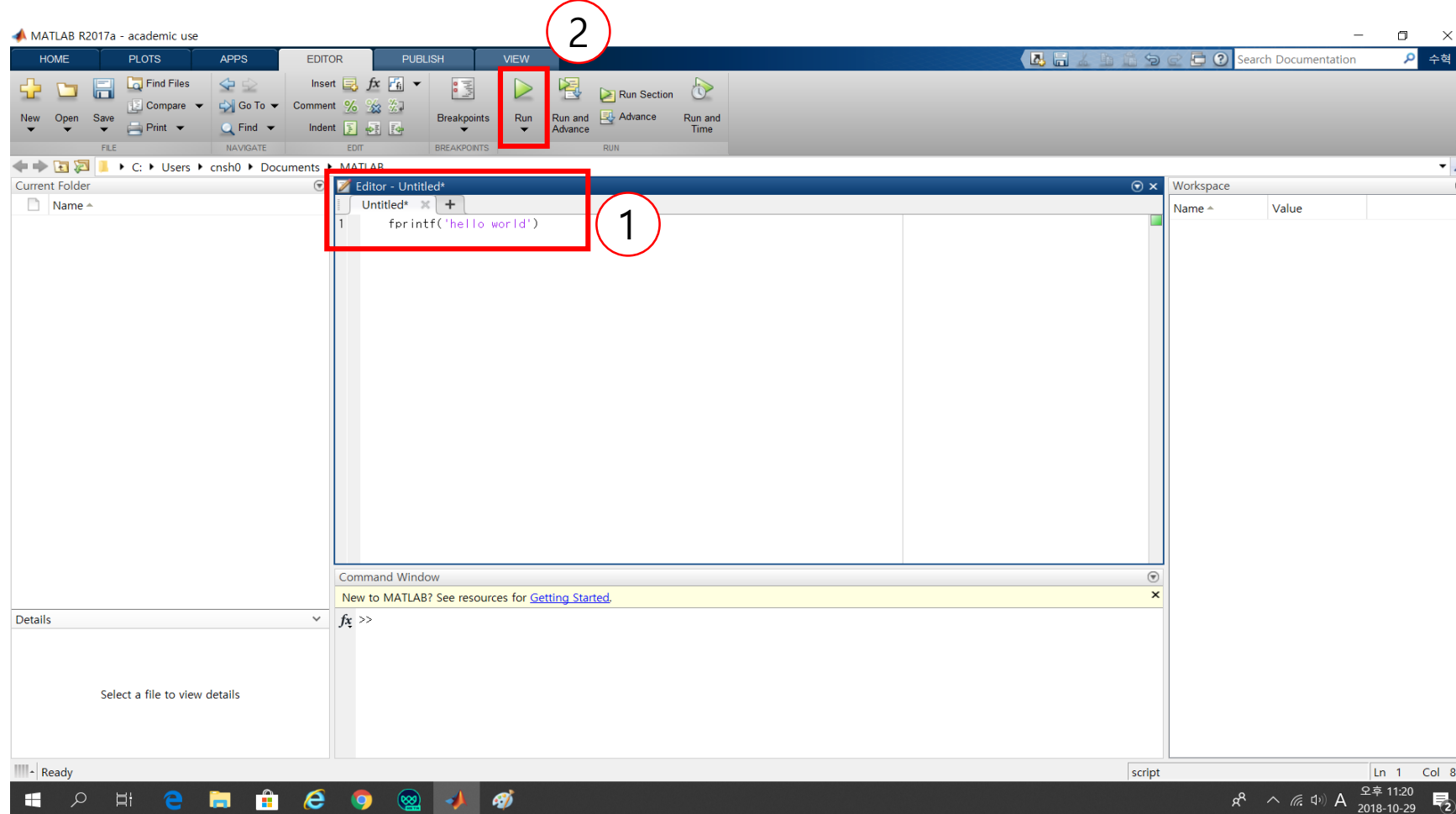
2. Make a new script file

1. Hello World

`fprintf('hello world')`

→ Same function in C but

→ Matlab dose not require `#include <stdio.h>`

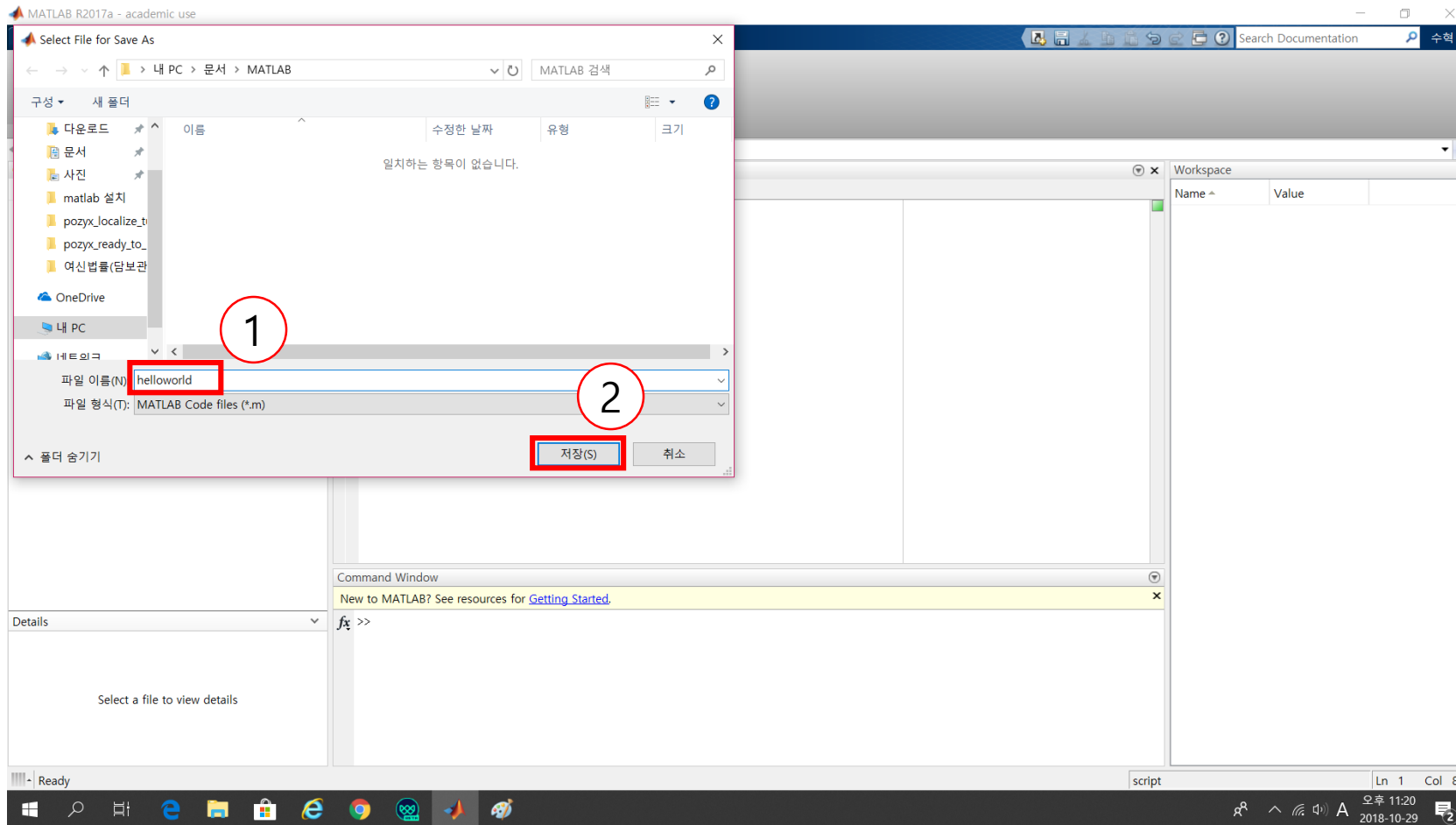


2. Make a new script file

Class 4

Programming - C

1. Save the script

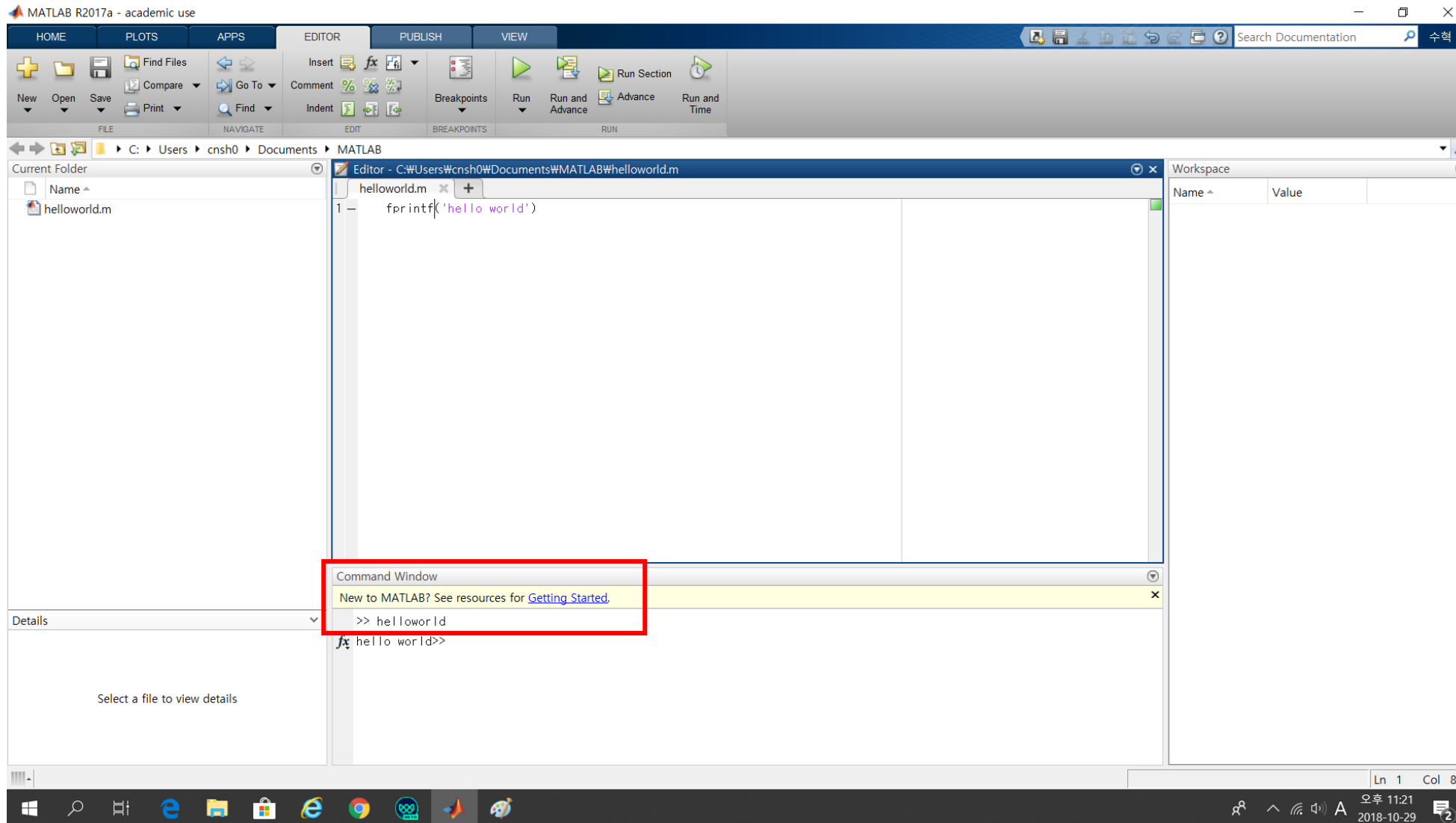


2. Make a new script file

Class 4

Programming - C

1. In the command window, you will get an output



❖ Built-in matlab function

The variable t represents time in seconds, and the dimensionless variable y represents the pressure difference across valve, normalized by a constant reference pressure. Plot this function for , $t \geq 0$

$$y(t) = e^{-8t} \sin(9.7t + \frac{\pi}{2})$$

Equation \rightarrow source code using built-in functions

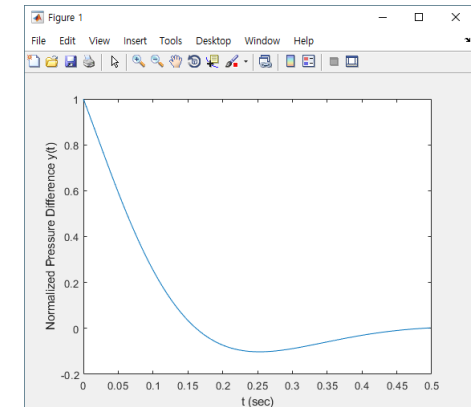
<source code>

```
Command Window
>> t = 0:0.003:0.5;
>> y = exp(-8*t).*sin(9.7*t+pi/2);
>> plot(t,y), xlabel('t (sec)'), ylabel('Normalized Pressure Difference y(t)')
fx >>
```

- The built-in matlab functions automatically operate on array arguments to produce an array result the same size as the array argument x .
- Use element-by-element operations(ex. $.*$, $.^$) if the arguments are arrays.
- $\exp(-8*t)$ and $\sin(9.7*t+\pi/2)$ will be vectors(=array) the same size as t .

Workspace	
Name	Value
t	1x167 double
y	1x167 double

<result>



❖ Built-in matlab function

The maximum height h achieved by an object thrown with a speed v at an angle Θ to the horizontal, neglecting drag, is

$$h = \frac{v^2 \sin^2 \theta}{2g}$$

Create a table showing the maximum height for the following values of v and Θ :

$v = 10, 12, 14, 16, 18, 20$ m/s $\Theta = 50^\circ, 60^\circ, 70^\circ, 80^\circ$

The rows in the table should correspond to the speed values, and the columns should correspond to the angles.

<source code>

```
ex2_20181029.m x +
1 - g = 9.8; v = 10:2:20;
2 - theta = 50:10:80;
3 - h = (v'.^2)*(sind(theta).^2)/(2*g);
4 - table = [0, theta; v', h]
5 -
```

v' : transpose v
 sind : 'sin' function in degree not radian

<result>

Command Window					
table =					
	0	50.0000	60.0000	70.0000	80.0000
10.0000	2.9940	3.8265	4.5052	4.9482	
12.0000	4.3114	5.5102	6.4875	7.1254	
14.0000	5.8682	7.5000	8.8302	9.6985	
16.0000	7.6646	9.7959	11.5334	12.6674	
18.0000	9.7006	12.3980	14.5969	16.0322	
20.0000	11.9760	15.3061	18.0209	19.7928	

- The arrays v and $theta$ contain the given velocities and angles. The array v is 1X6 and the array $theta$ is 1X4.
- $v'.^2$ is a 6X1 array, and the term $\text{sind}(theta).^2$ is 1X4 array. Then, h is a $(6X1)(1X4) = (6X4)$ matrix
- The array $[0, theta]$ is 1X5 and the array $[v', h]$ is 6X5, so the matrix $table$ is 7X5.

❖ Special matrices

Command	Description
eye(n)	Creates an n X n identity matrix.
eye(size(A))	Creates an identity matrix the same size as the matrix A.
ones(n)	Creates an n X n matrix of 1s.
ones(m, n)	Creates an m X n matrix of 1s.
ones(size(A))	Creates an array of 1s the same size as the array A.
zeros(n)	Creates an n X n matrix of 0s.
zeros(m, n)	Creates an m X n matrix of 0s.
zeros(size(A))	Creates an array of 0s the same size as the array A.

To create and plot the function

$$f(x) = \begin{cases} 10 & 0 \leq x \leq 2 \\ 0 & 0 < x < 5 \\ -3 & 5 \leq x \leq 7 \end{cases}$$

<source code>

```

Editor - C:\Users\User\Documents\MATLAB\ex3_20
ex3_20181029.m
1 - x1 = 0:0.01:2;
2 - f1 = 10*ones(size(x1));
3 - x2 = 2.01:0.01:4.99;
4 - f2 = zeros(size(x2));
5 - x3 = 5:0.01:7;
6 - f3 = 03*ones(size(x3));
7 - f = [f1, f2, f3];
8 - x = [x1, x2, x3];
9 - plot(x,f), xlabel('x'), ylabel('y')

```

<result>

