

# ELECENG 3TP3

## Lab #1 Report

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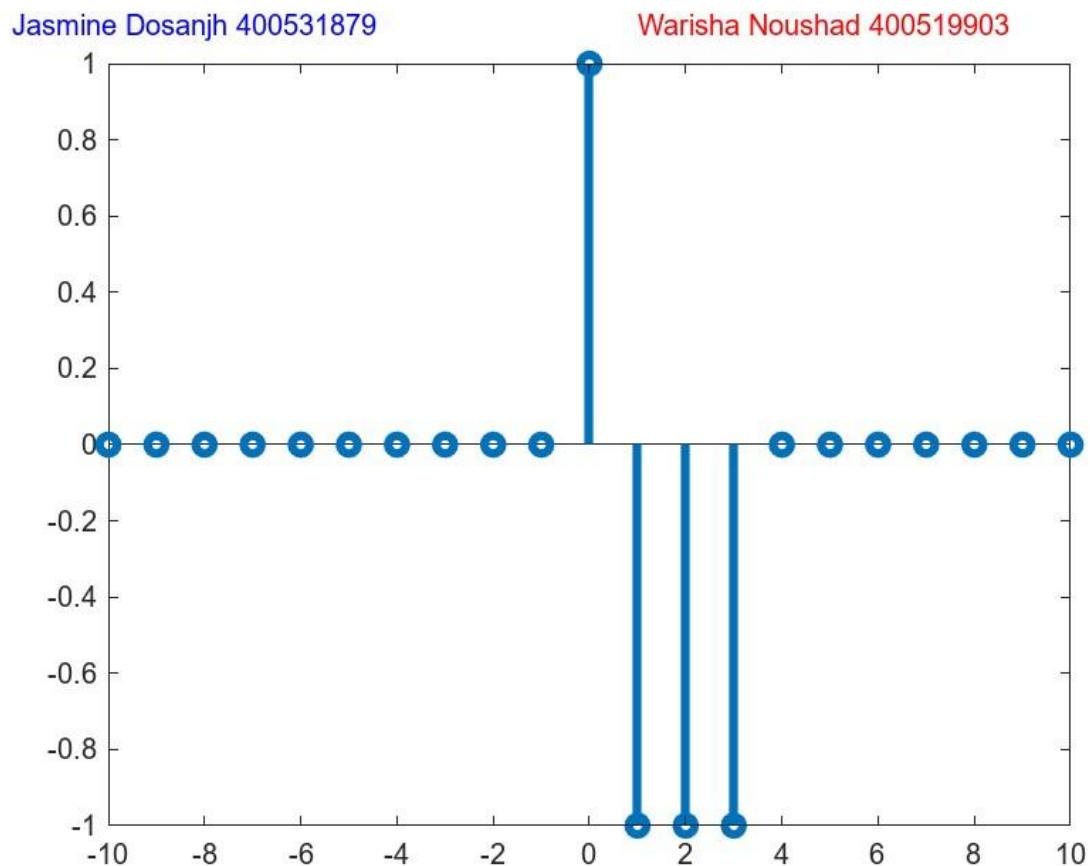
October 21, 2025

## *Question 1*

1. (a)

```
n = -10:10;
% Create an instance of the SimpleFunctions object.
f = SimpleFunctions();
% Evaluate an = term n, then plot x[n]
a1 = f.unitstep(n);
a2 = f.unitstep(n-1);
a3 = f.unitstep(n-4);
xn = a1 - 2*a2 + a3;
stem(n, xn, 'LineWidth', 3);

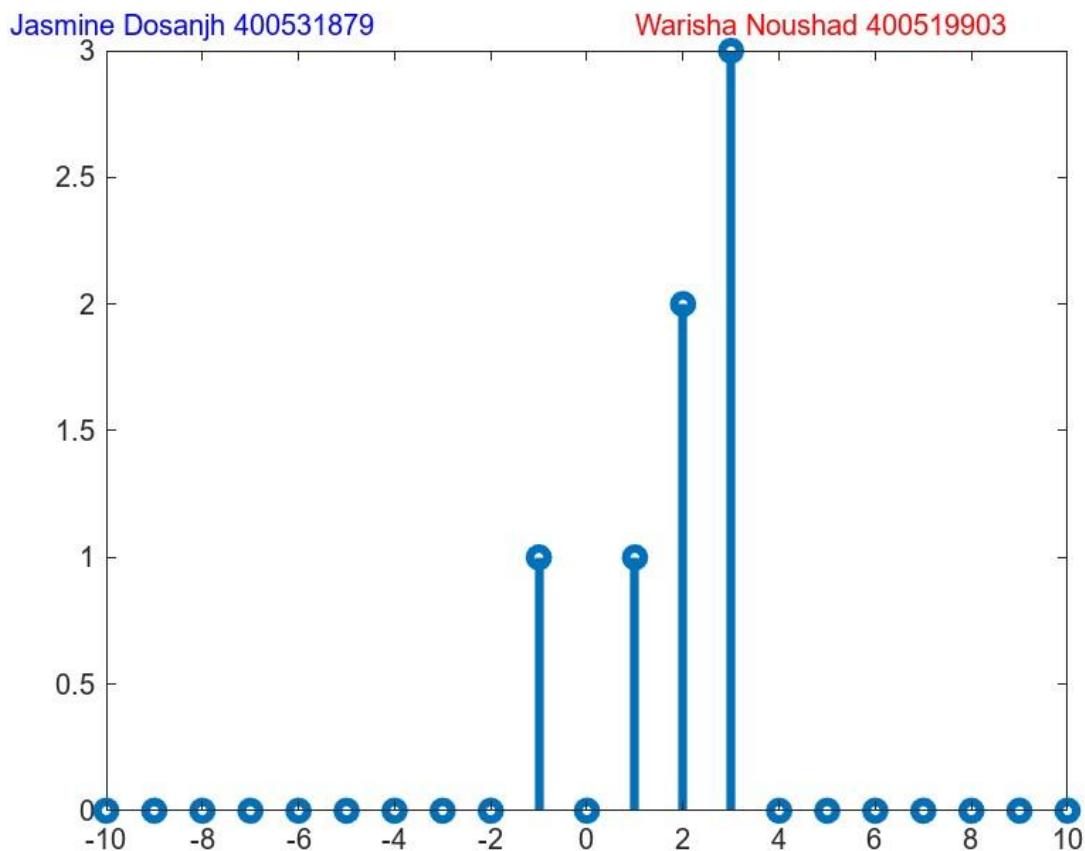
% For Lab Report
text(-12, 1.1, 'Jasmine Dosanjh 400531879', 'FontSize', 10, 'Color', 'b');
text(1, 1.1, 'Warisha Noushad 400519903', 'FontSize', 10, 'Color', 'r');
exportgraphics(gcf, 'Q1a_Plot.jpg');
```



**1. (b)**

```
n = -10:10;
% Create an instance of the SimpleFunctions object.
f = SimpleFunctions();
% Evaluate an = term n, then plot x[n]
a1 = f.unitstep(n+2);
a2 = f.unitstep(n);
a3 = f.unitstep(n-4);
xn = (n+2).*a1 - 2*a2 - n.*a3;
stem(n, xn, 'LineWidth', 3);

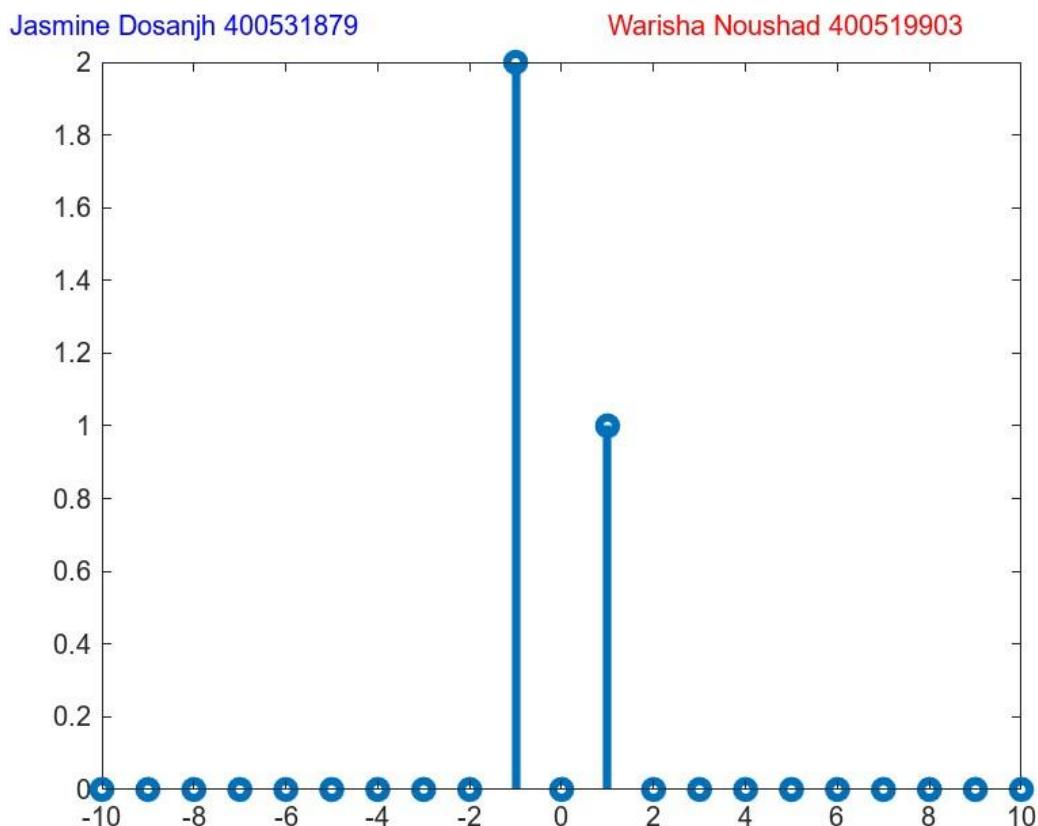
% For Lab Report
text(-12, 1.1, 'Jasmine Dosanjh 400531879', 'FontSize', 10, 'Color', 'b');
text(1, 1.1, 'Warisha Noushad 400519903', 'FontSize', 10, 'Color', 'r');
exportgraphics(gcf, 'Q1b_Plot.jpg');
```



**1. (c)**

```
n = -10:10;
% Create an instance of the SimpleFunctions object.
f = SimpleFunctions();
% Evaluate an = term n, then plot x[n]
a1 = f.delta(n+1);
a2 = f.delta(n);
a3 = f.unitstep(n+1);
a4 = f.unitstep(n-2);
xn = a1 - a2 + a3 - a4;
stem(n, xn, 'LineWidth', 3);

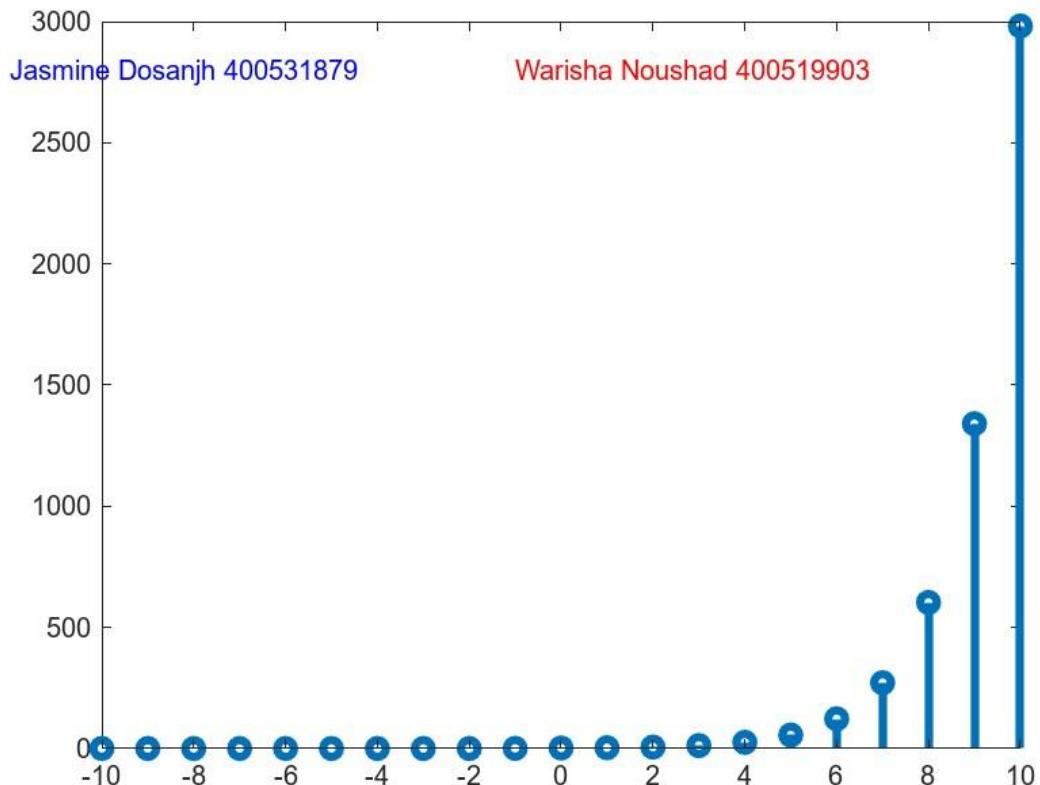
% For Lab Report
text(-12, 3.1, 'Jasmine Dosanjh 400531879', 'FontSize', 10, 'Color', 'b');
text(1, 3.1, 'Warisha Noushad 400519903', 'FontSize', 10, 'Color', 'r');
exportgraphics(gcf, 'Q1c_Plot.jpg');
```



**1. (d)**

```
n = -10:10;
% Create an instance of the SimpleFunctions object.
f = SimpleFunctions();
% Evaluate an = term n, then plot x[n]
a1 = f.unitstep(n+1);
a2 = f.unitstep(n);
xn = exp(0.8.*n).*a1 + a2;
stem(n, xn, 'LineWidth', 3);

% For Lab Report
text(-12, 2800, 'Jasmine Dosanjh 400531879', 'FontSize', 10, 'Color', 'b');
text(-1, 2800, 'Warisha Noushad 400519903', 'FontSize', 10, 'Color', 'r');
exportgraphics(gcf, 'Q1d_Plot.jpg');
```



## *Question 2*

2. (a)

```
% Read table array file
opts = detectImportOptions('course_grades_2024.xlsx');
opts = setvartype(opts, {'ID_Number', 'Name'}, 'string'); % import id and name
% columns as strings
table = readtable('course_grades_2024.xlsx', opts) % table array

% Extract Name and Lab Mark columns
gradesTable = table(:,[1 3 4 5 6])

% Sort table with highest total lab mark at top
sortedGrades = sortrows(gradesTable,[ "Lab_1" "Lab_2" "Lab_3" "Lab_4"], "descend")

% Extract student with highest total lab mark from top
topStudent = sortedGrades(2,:)

% Output Highest total lab mark and Name
Name = topStudent.Name
totalMark = topStudent.Lab_1 + topStudent.Lab_2 + topStudent.Lab_3 +
topStudent.Lab_4
```

Name = "Morgan Bush"

totalMark = 32

**2. (b)**

```
% Read table array file
opts = detectImportOptions('course_grades_2024.xlsx');
opts = setvartype(opts, {'ID_Number', 'Name'}, 'string'); % import id and name
% columns as strings
table = readtable('course_grades_2024.xlsx', opts) % table array

% Extract Name and Exam Mark columns
gradesTable = table(:,[1 8 9 10 11])

% Sort table with highest total exam mark at top
sortedGrades = sortrows(gradesTable,["Exam_1" "Exam_2" "Exam_3"
"Exam_4"],"descend")

% Extract student with highest total exam mark from top
topStudent = sortedGrades(2,:)

% Output Highest total lab exam and Name
Name = topStudent.Name
totalMark = topStudent.Exam_1 + topStudent.Exam_2 + topStudent.Exam_3 +
topStudent.Exam_4
```

```
Name = "Anthony Bernard"
totalMark = 37
```

**2. (c)**

```
% Read table array file
opts = detectImportOptions('course_grades_2024.xlsx');
opts = setvartype(opts, {'ID_Number', 'Name'}, 'string'); % import id and name
% columns as strings
table = readtable('course_grades_2024.xlsx', opts) % table array

% Extract Name and Mark columns
gradesTable = table(:,[1 3:11])

% Sort table with highest total mark at top
sortedGrades = sortrows(gradesTable,[ "Exam_1" "Exam_2" "Exam_3" "Exam_4" "Lab_1"
"Lab_2" "Lab_3" "Lab_4" "Midterm"], "descend")

% Extract student with highest total exam mark from top
topStudent = sortedGrades(2,:)

% Output Highest total lab exam and Name
Name = topStudent.Name
totalMark = topStudent.Exam_1 + topStudent.Exam_2 + topStudent.Exam_3 +
topStudent.Exam_4 + topStudent.Lab_1 + topStudent.Lab_2 + topStudent.Lab_3 +
topStudent.Lab_4 + topStudent.Midterm

Name = "Anthony Bernard"
totalMark = 79
```

**2. (d)**

```
% Read table array file
opts = detectImportOptions('course_grades_2024.xlsx');
opts = setvartype(opts, {'ID_Number', 'Name'}, 'string'); % import id and name
% columns as strings
table = readtable('course_grades_2024.xlsx', opts) % table array

% Create new row entries
newRow1 = {"Jasmine Dosanjh", "400531879", 100, 78, 52, 44, 100, 78, 52, 44, 52}
newRow2 = {"Warisha Noushad", "400519903", 88, 90, 47, 21, 99, 78, 82, 76, 92}

% Add new row entries in the table
table = [table ; newRow1 ; newRow2]
```

	Name	ID_Number	Lab_1	Lab_2	Lab_3	Lab_4	Midterm
1	"Maximum Mark"	"0"	10	10	10	10	20
2	"Kacie Stephenson"	"1803033"	7	2	9	0	9
3	"Yassin Jordan"	"1884150"	1	2	10	3	8
4	"Lowri Mathews"	"1853847"	2	0	0	2	17
5	"Tiya Sheridan"	"1810192"	7	1	0	6	15
6	"Nikola Forrest"	"1891352"	1	7	0	6	5
7	"Veer Blair"	"18111313"	4	8	5	3	12
8	"Isabelle McGrath"	"1804841"	6	7	4	0	13
9	"Samir Greaves"	"1881925"	9	3	7	1	6
10	"Zander Kendall"	"1877711"	8	10	5	4	17
11	"Shahzaib Buckley"	"1830894"	4	5	7	9	8
12	"Morgan Bush"	"1855191"	9	6	7	10	1
13	"Amaan Robbins"	"1821012"	1	8	4	4	8
14	"Theodore Lawson"	"1844339"	5	7	10	7	14
15	"Ace Branch"	"1898468"	2	1	3	7	11
16	"Anthony Bernard"	"1883633"	4	1	10	8	19
17	"Tobey Bell"	"1808742"	0	10	8	2	10
18	"Jannat Cassidy"	"1863450"	1	2	4	5	10
19	"Imran Marquez"	"1830190"	2	9	1	6	17
20	"Amani Castro"	"1835544"	8	9	5	7	3
21	"Blanka Holt"	"1820930"	6	5	2	0	8
22	"Jasmine Dosanjh"	"400531879"	100	78	52	44	100
23	"Warisha Noushad"	"400519903"	88	90	47	21	99

### ***Question 3***

```
% Read image into a matrix
img = imread('ee3tp3picture2024.jpg');

% Extract out each colour component
red = img(:,:,1);
green = img(:,:,2);
blue = img(:,:,3);

% Rescale red and green by different factors
redScaled = 5.5*red;
greenScaled = 5.5*green;

% Recombine the three components into a new 3D image
reconstructed_image = cat(3, redScaled, greenScaled, blue);

% Display reconstructed image
imshow(reconstructed_image)

% Save final result
imwrite(reconstructed_image, 'my_fixed_image.jpg')
```

