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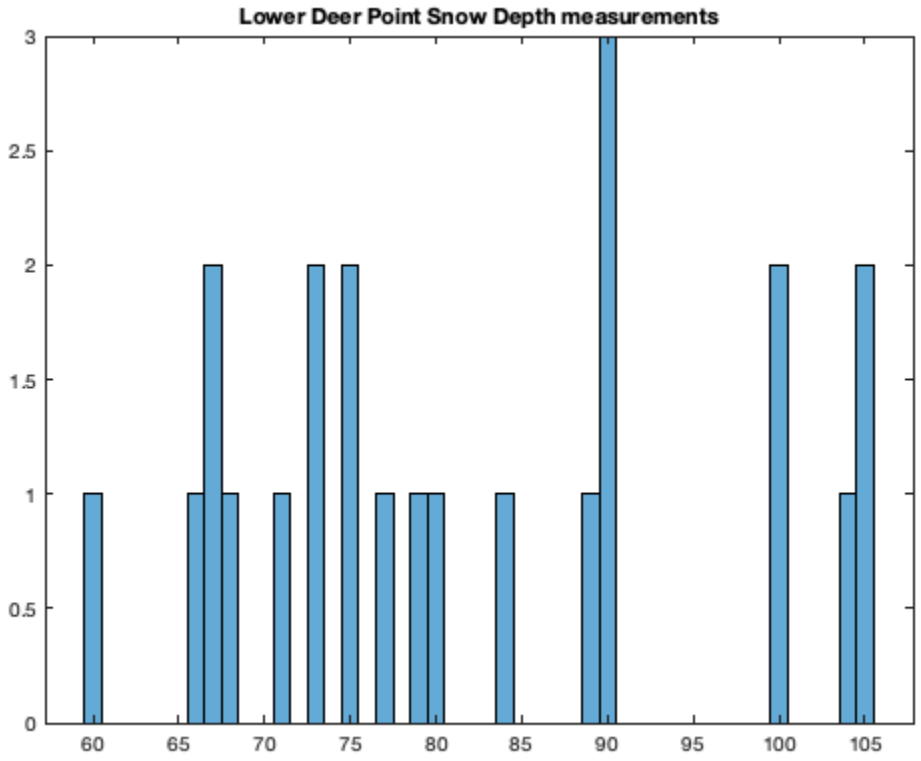
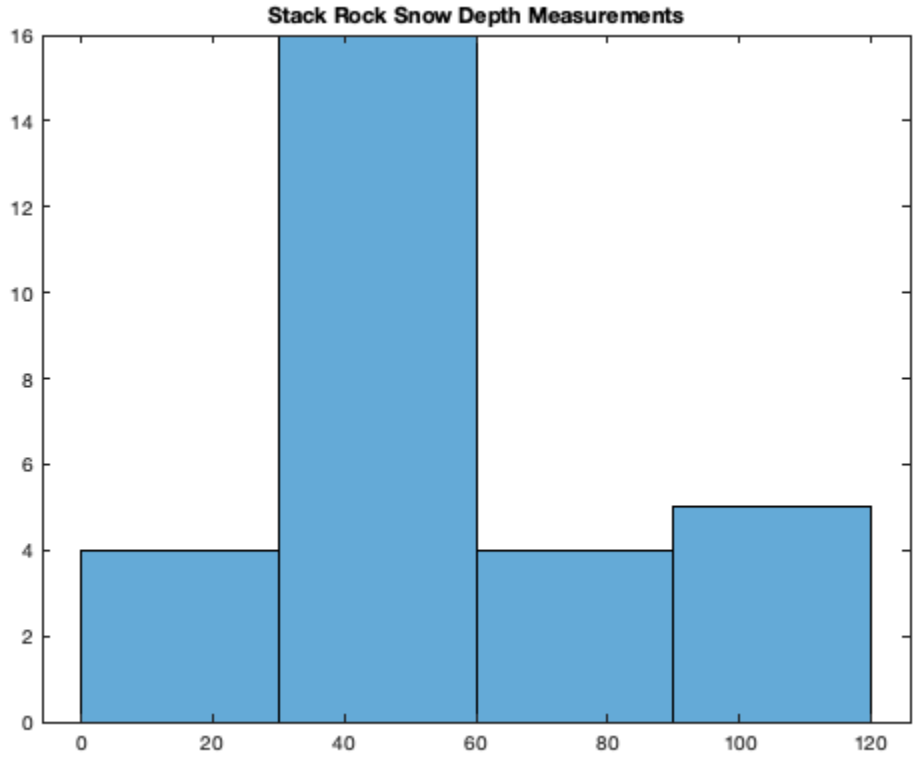
Snow depth distrubutions for Lower Deer Point

```
Lower_Deer_Data = [60, 66, 67, 67, 68, 71, 73, 73, 75, 75, 77, 79, 80,
 84, 89, 90, 90, 90, 100, 100, 104, 105, 105];
histogram(Lower_Deer_Data);
title('Lower Deer Point Snow Depth measurements');
```



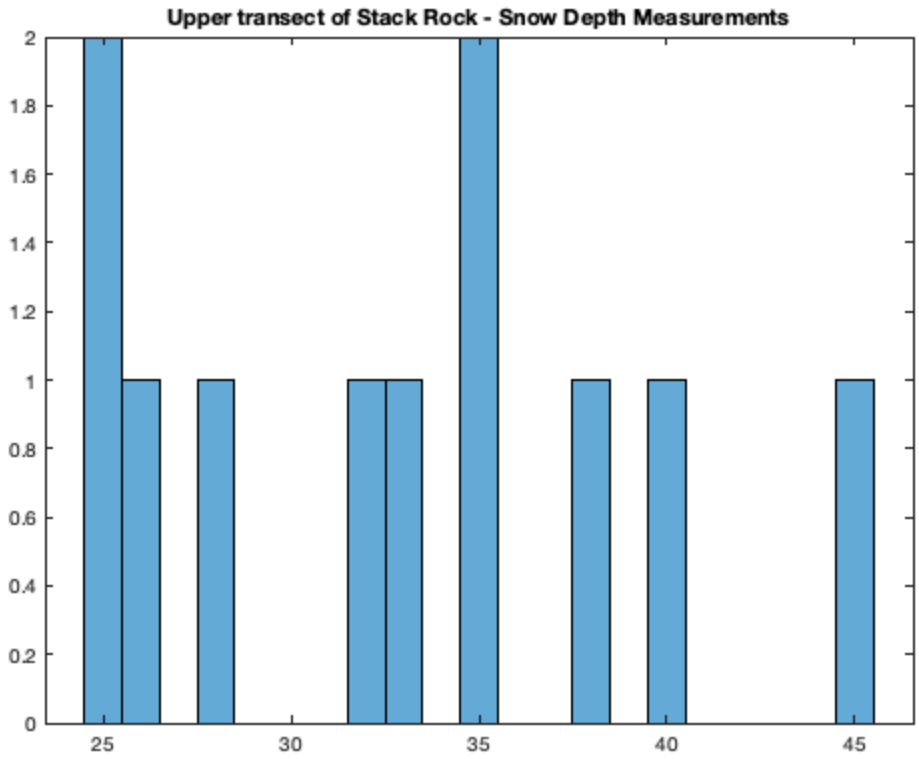
Snow depth distributions for Stack Rock (both transects)

```
Stack_Data = [25, 25, 26, 28, 32, 33, 35, 35, 38, 40, 45, 48, 48, 50,
 50, 54, 54, 55, 56, 59, 60, 60, 80, 87, 90, 94, 95, 96, 96];
histogram(Stack_Data);
title('Stack Rock Snow Depth Measurements');
```



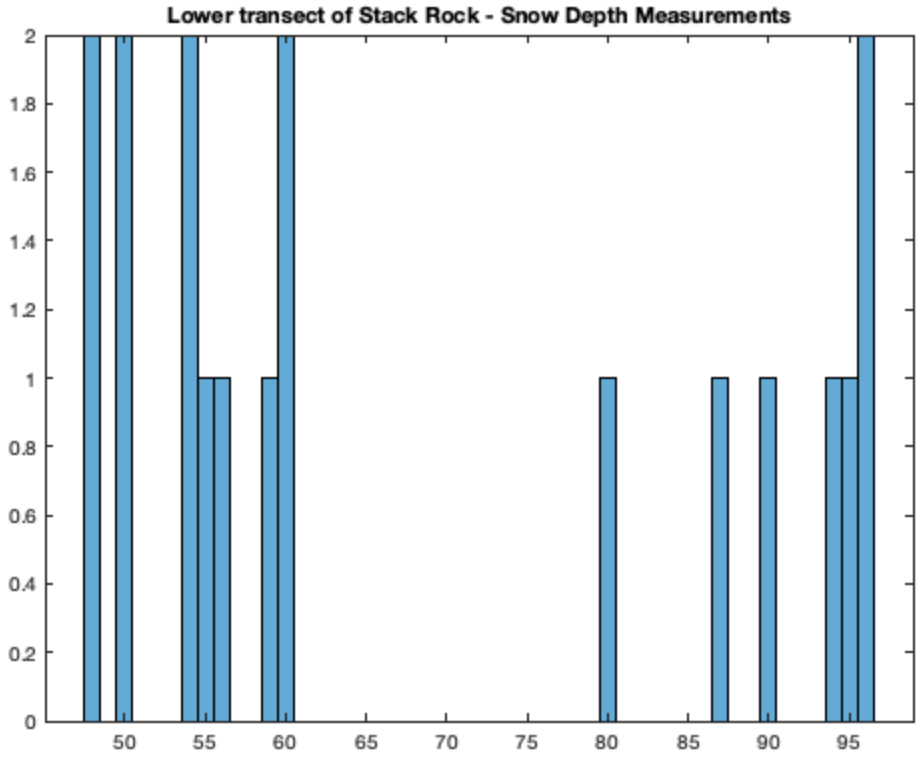
Snow depth distrubution for upper portion of stack rock:

```
Upper_stack_data = [25, 25, 26, 28, 32, 33, 35, 35, 38, 40, 45];
histogram(Upper_stack_data);
title('Upper transect of Stack Rock - Snow Depth Measurements');
```



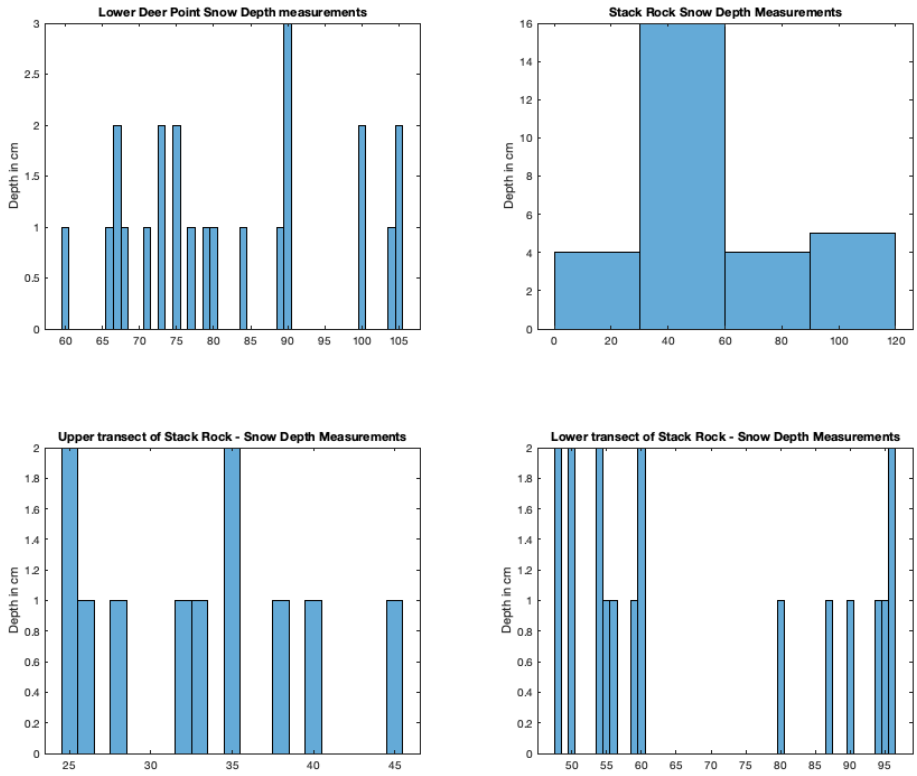
Snow depth distribution for lower portion of stack rock:

```
Lower_stack_data = [48, 48, 50, 50, 54, 54, 55, 56, 59, 60, 60, 80,
 87, 90, 94, 95, 96, 96];
histogram(Lower_stack_data);
title('Lower transect of Stack Rock - Snow Depth Measurements');
```



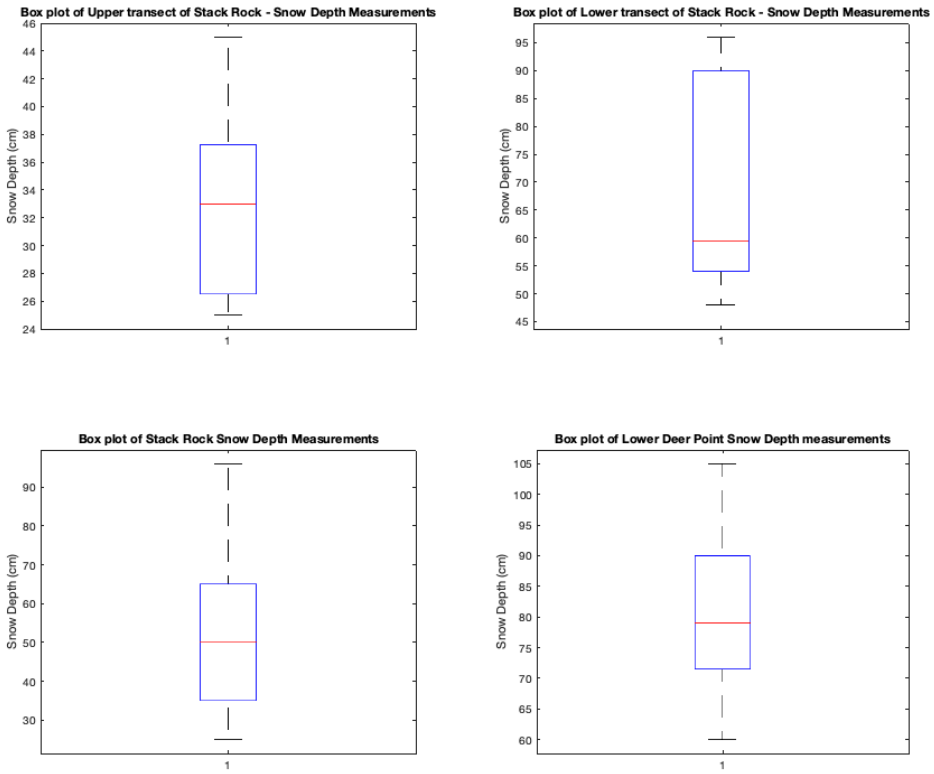
Subplot

```
figure('Position', [600 600 1000 800]);

subplot(2,2,1)
histogram(Lower_Deer_Data);
title('Lower Deer Point Snow Depth measurements');
ylabel('Depth in cm');

subplot(2,2,2)
histogram(Stack_Data);
title('Stack Rock Snow Depth Measurements');
ylabel('Depth in cm');

subplot(2,2,3)
histogram(Upper_stack_data);
title('Upper transect of Stack Rock - Snow Depth Measurements');
ylabel('Depth in cm');

subplot(2,2,4)
histogram(Lower_stack_data);
title('Lower transect of Stack Rock - Snow Depth Measurements');
ylabel('Depth in cm');
```



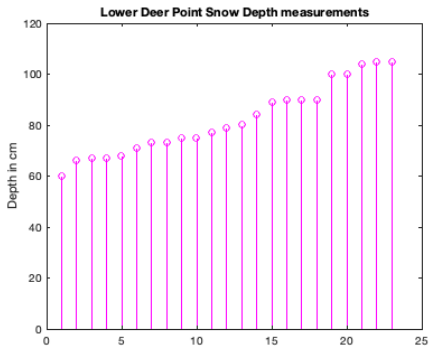
Box plots

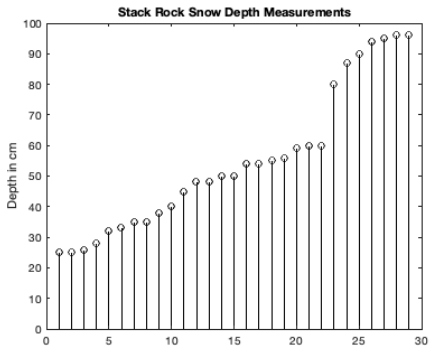
```
figure('Position', [600 600 1000 800]);
subplot(2,2,1)
boxplot(Upper_stack_data);
title('Box plot of Upper transect of Stack Rock - Snow Depth
 Measurements');
ylabel('Snow Depth (cm)');

subplot(2,2,2)
boxplot(Lower_stack_data);
title('Box plot of Lower transect of Stack Rock - Snow Depth
 Measurements');
ylabel('Snow Depth (cm)');

subplot(2,2,3)
boxplot(Stack_Data);
title('Box plot of Stack Rock Snow Depth Measurements');
ylabel('Snow Depth (cm)');

subplot(2,2,4)
boxplot(Lower_Deer_Data);
title('Box plot of Lower Deer Point Snow Depth measurements');
ylabel('Snow Depth (cm)');
```

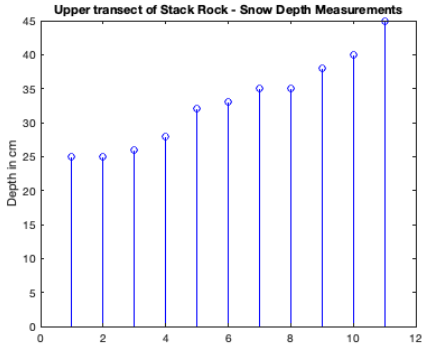


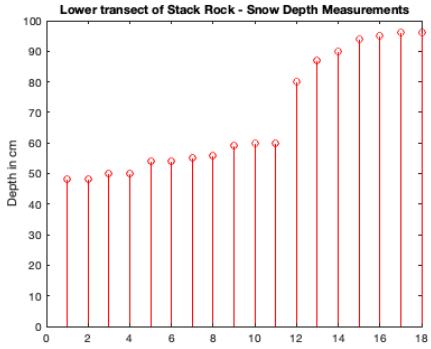
Stem plots

```
figure('Position', [600 600 1000 800]);

subplot(2,2,1)
stem(Lower_Deer_Data,'m');
title('Lower Deer Point Snow Depth measurements');
ylabel('Depth in cm');

subplot(2,2,2)
stem(Stack_Data,'k');
title('Stack Rock Snow Depth Measurements');
ylabel('Depth in cm');

subplot(2,2,3)
stem(Upper_stack_data,'b');
title('Upper transect of Stack Rock - Snow Depth Measurements');
ylabel('Depth in cm');

subplot(2,2,4)
stem(Lower_stack_data,'r');
title('Lower transect of Stack Rock - Snow Depth Measurements');
ylabel('Depth in cm');
```





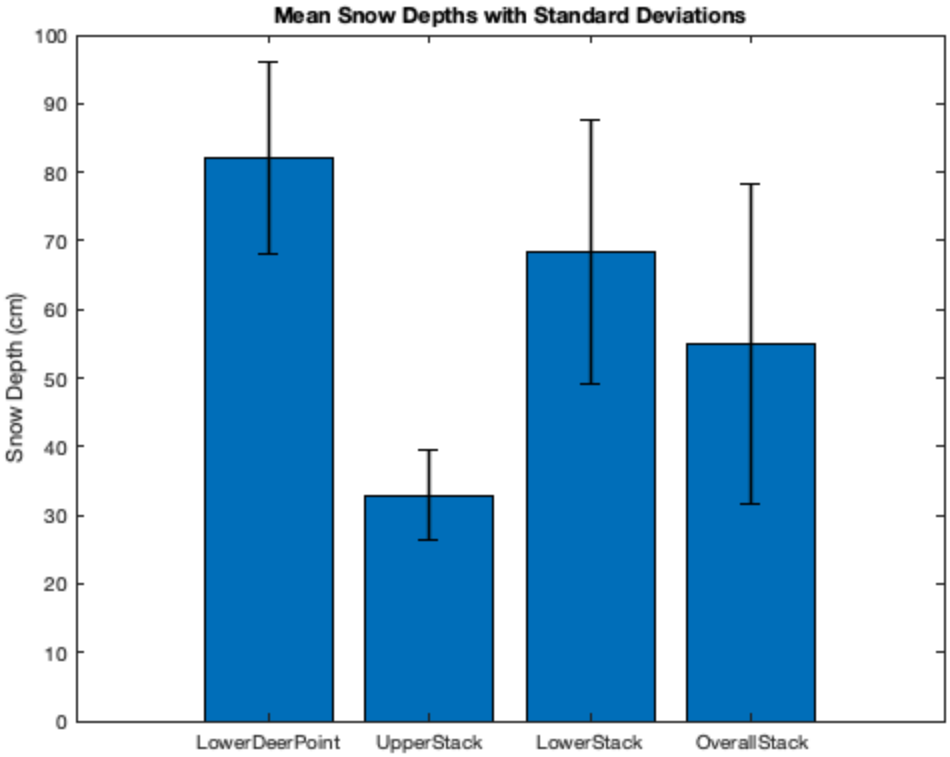




Standard dev plotting:

```
means = [mean(Lower_Deer_Data), mean(Upper_stack_data),
 mean(Lower_stack_data), mean(Stack_Data)];
stds = [std(Lower_Deer_Data), std(Upper_stack_data),
 std(Lower_stack_data), std(Stack_Data)];

figure
bar(means)
hold on

errorbar(means, stds, 'k', 'LineStyle', 'none', 'LineWidth', 1.5)
ylabel('Snow Depth (cm)')
xticklabels({'LowerDeerPoint', 'UpperStack', 'LowerStack', 'OverallStack'})
title('Mean Snow Depths with Standard Deviations')

disp('Standard dev plotting was helpful because I wanted to see
 variability in the data and how they deviate from the mean values');
fprintf('\n');
```

Standard dev plotting was helpful because I wanted to see variability in the data and how they deviate from the mean values



Standard deviation:

```
standard_dev_lowerstack = std(Lower_stack_data);
standard_dev_upperstack = std(Upper_stack_data);
standard_dev_stackoverall = std(Stack_Data);
standard_dev_deer = std(Lower_Deer_Data);

str = 'The standard deviation of the overall Stack Rock data is: ';
disp([str, num2str(standard_dev_stackoverall)]);

str = 'The standard deviation of the lower transect of Stack Rock data
 is: ';
disp([str, num2str(standard_dev_lowerstack)]);

str = 'The standard deviation of the upper transect of Stack Rock data
 is: ';
disp([str, num2str(standard_dev_upperstack)]);

str = 'The standard deviation of the Lower Deer Point data is: ';
disp([str, num2str(standard_dev_deer)]);

fprintf('\n');
```

The standard deviation of the overall Stack Rock data is: 23.43
The standard deviation of the lower transect of Stack Rock data is:
19.2819

```
The standard deviation of the upper transect of Stack Rock data is:
 6.5491
The standard deviation of the Lower Deer Point data is: 13.8823
```

Mean, median, mode, range

```
fprintf('\n');

mean_value_stack = mean(Stack_Data);
str = 'The mean of the overall Stack Rock data is: ';
disp([str, num2str(mean_value_stack)]);

mean_value_upperstack = mean(Upper_stack_data);
str = 'The mean of the upper transect of Stack Rock data is: ';
disp([str, num2str(mean_value_upperstack)]);

mean_value_lowerstack = mean(Lower_stack_data);
str = 'The mean of the lower transect of Stack Rock data is: ';
disp([str, num2str(mean_value_lowerstack)]);

mean_value_deer = mean(Lower_Deer_Data);
str = 'The mean of the Lower Deer Point data is: ';
disp([str, num2str(mean_value_deer)]);

fprintf('\n');

median_value_stack = median(Stack_Data);
str = 'The median of the overall Stack Rock data is: ';
disp([str, num2str(median_value_stack)]);

median_value_upperstack = median(Upper_stack_data);
str = 'The median of the upper transect of Stack Rock data is: ';
disp([str, num2str(median_value_upperstack)]);


median_value_lowerstack = median(Lower_stack_data);
str = 'The median of the lower transect of Stack Rock data is: ';
disp([str, num2str(median_value_lowerstack)]);

median_value_deer = median(Lower_Deer_Data);
str = 'The median of the Lower Deer Point data is: ';
disp([str, num2str(median_value_deer)]);

fprintf('\n');

mode_value_stack = mode(Stack_Data);
str = 'The mode of the overall Stack Rock data is: ';
disp([str, num2str(mode_value_stack)]);

mode_value_upperstack = mode(Upper_stack_data);
str = 'The mode of the upper transect of Stack Rock data is: ';
disp([str, num2str(mode_value_upperstack)]);
```

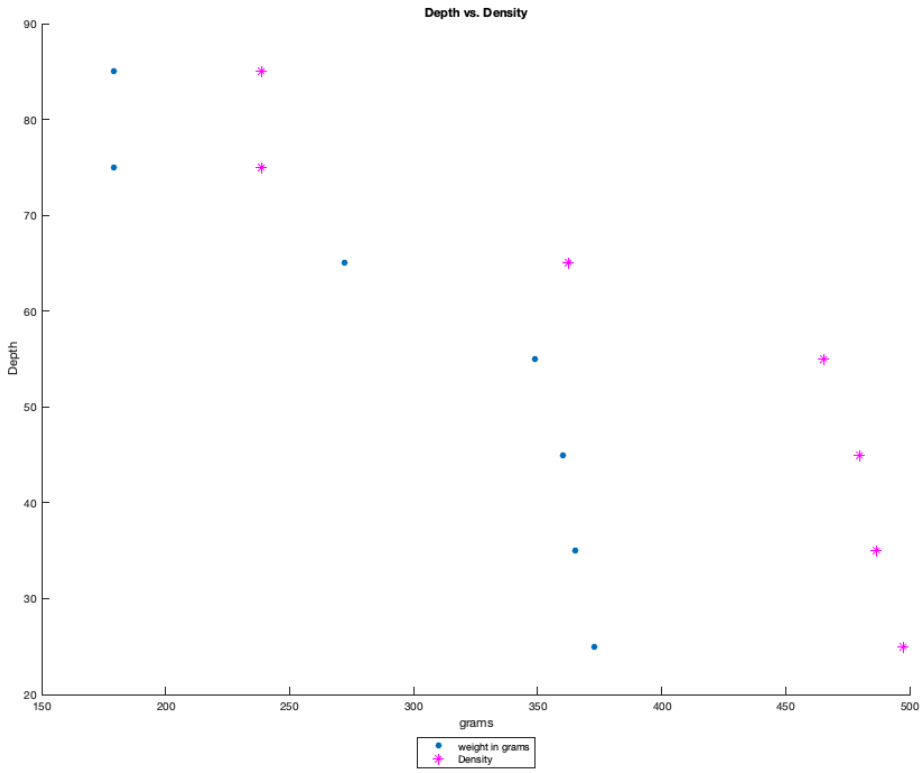
```
mode_value_lowerstack = mode(Lower_stack_data);
str = 'The mode of the lower transect of Stack Rock data is: ';
disp([str, num2str(mode_value_lowerstack)]);

mode_value_deer = mode(Lower_Deer_Data);
str = 'The mode of the Lower Deer Point data is: ';
disp([str, num2str(mode_value_deer)]);


fprintf('\n');

range_value_stack = range(Stack_Data);
str = 'The range of the overall Stack Rock data is: ';
disp([str, num2str(range_value_stack)]);

range_value_upperstack = range(Upper_stack_data);
str = 'The range of the upper transect of Stack Rock data is: ';
disp([str, num2str(range_value_upperstack)]);


range_value_lowerstack = range(Lower_stack_data);
str = 'The range of the lower transect of Stack Rock data is: ';
disp([str, num2str(range_value_lowerstack)]);

range_value_deer = range(Lower_Deer_Data);
str = 'The range of the Lower Deer Point data is: ';
disp([str, num2str(range_value_deer)]);

fprintf('\n');
disp('clc to clear the command window');
```

```
The mean of the overall Stack Rock data is: 54.9655
The mean of the upper transect of Stack Rock data is: 32.9091
The mean of the lower transect of Stack Rock data is: 68.4444
The mean of the Lower Deer Point data is: 82.087

The median of the overall Stack Rock data is: 50
The median of the upper transect of Stack Rock data is: 33
The median of the lower transect of Stack Rock data is: 59.5
The median of the Lower Deer Point data is: 79

The mode of the overall Stack Rock data is: 25
The mode of the upper transect of Stack Rock data is: 25
The mode of the lower transect of Stack Rock data is: 48
The mode of the Lower Deer Point data is: 90

The range of the overall Stack Rock data is: 71
The range of the upper transect of Stack Rock data is: 20
The range of the lower transect of Stack Rock data is: 48
The range of the Lower Deer Point data is: 45
```

clc to clear the command window

Snow pit data:

```
figure('Position', [600 600 1000 800]);

depths = [85, 75, 65, 55, 45, 35, 25];
grams = [179, 179, 272, 349, 360, 365, 373];
volume = 0.75; % in cubic meters
density = grams / volume; % in grams per cubic centimeter

scatter(grams, depths,'o','Filled');
ylabel('Depth');
xlabel('grams')
title('Depth vs. Density');

hold on;
scatter(density,depths,'*','m');



% fine_depths = 25:0.1:85;
% fine_density = interp1(depths, density, fine_depths, 'spline');
%
%
% plot(fine_density,fine_depths,'m')
% xlabel('Depth from the bottom in cm')
% ylabel('Snow density in g/cm^3')
% title('85 cm deep snow pit - snow densities from Lower Deer Point -
 February 17th, 2023')
% hold on;

% scatter(fine_density,fine_depths,'k');

legend('weight in grams','Density', 'Location', 'southoutside')
```



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