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## Homework #2

```
clear;
close all;
clc;

enrollment = [
% Year
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008
2009 2010 2011 2012 2013 2014 2015      2016      2017
% UM
9996 9928 9213 9451 9945 10282 10698 11135 11222 11358 11435 11797
11912 11818 11867 11501 11168 10901 11247 11286      10922      11219
11240
% UMA
6023 5496 5248 5130 5612 5617 5575 5722 5943 5538 5494 5257 5101 4974
5054 5074 4974 4990 4770 4664      4683      4416      4014
% UMF
2510 2512 2446 2507 2479 2413 2435 2395 2420 2349 2452 2424 2265 2227
2238 2322 2269 2179 2061 1960      2016      2000      2080
% UMFK
731 767 690 827 926 886 897 827 924 1076 1193 1339 1269 1102 1126 1073
1080 1169 1209 1327      1559      1904      1760
% UMM
856 915 884 899 908 927 1017 1068 1313 1191 1149 1259 1093 1023 964
951 863 925 892 810      786      745      701
% UMPI
1278 1347 1307 1344 1378 1427 1367 1560 1546 1652 1548 1655 1533 1455
1436 1434 1453 1463 1263 1138      1289      1326      1408
% USM
9721 9966 10230 10462 10645 10820 10966 11382 11007 11089 10974 10478
10453 10009 9655 9654 9301 9385 8923 8428      7739      7855      7794
];
```

## Problem #1

```
% Split the enrollment data into the respective universities.
year = enrollment(1,[1:end-1]);
um = enrollment(2,[1:end-1]) / 1e3;
uma = enrollment(3,[1:end-1]) / 1e3;
umf = enrollment(4,[1:end-1]) / 1e3;
umfk = enrollment(5,[1:end-1]) / 1e3;
```

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```

umm = enrollment(6,[1:end-1]) / 1e3;
umpi = enrollment(7,[1:end-1]) / 1e3;
usm = enrollment(8,[1:end-1]) / 1e3;

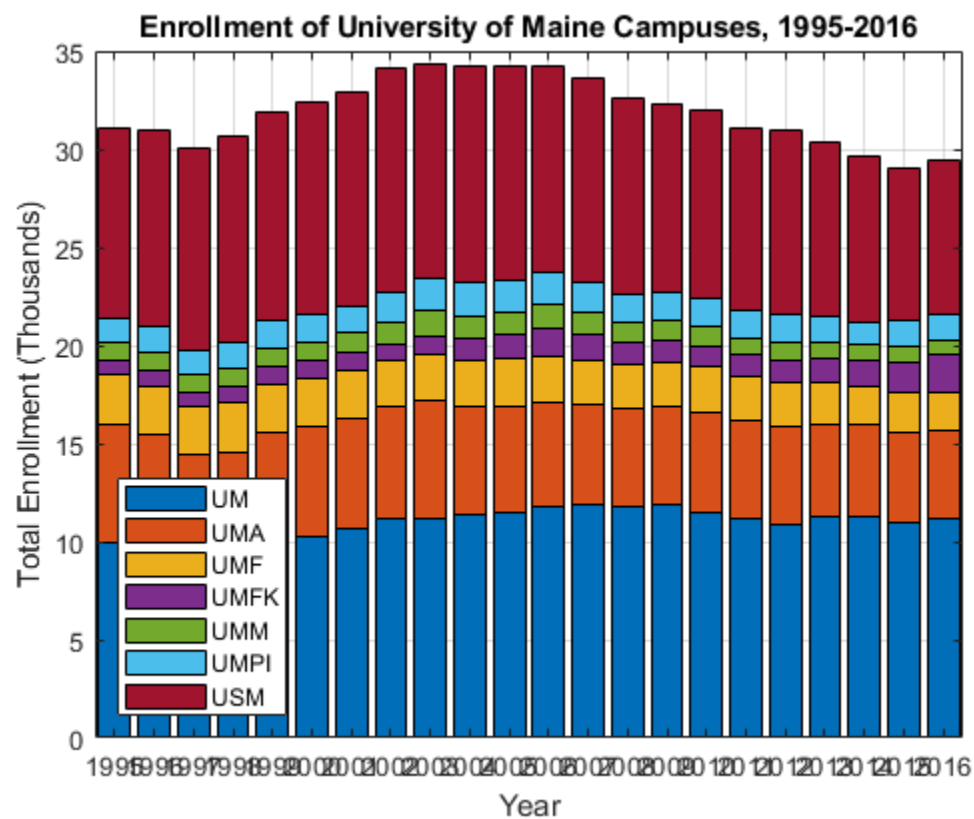
```

## Figure 1

```

% Create a stacked bar graph for the different university enrollemnts.
% Divide by 1e3 to put in terms of thousands.
figure(1);
bar(year, enrollment([2:8], [1:end-1]))' / 1e3, 'stacked');
% Now make the graph match the one in the HW.
grid on;
title('Enrollment of University of Maine Campuses, 1995-2016');
xlabel('Year');
ylabel('Total Enrollment (Thousands)');
xlim([1994.5 2016.5]);
set(gca, 'XTick', [1995:1:2016]);
legend('UM', 'UMA', 'UMF', 'UMFK', 'UMM', 'UMPI', 'USM', 'Location', 'southwest');

```



## Figure 2

```

% Create a line chart for UM and USM enrollment percentages.
% Find the total enrollment and multiply by 100 to get %.
figure(2);
UMpercent = (um ./ sum(enrollment([2:8], [1:end-1]))) * 100;

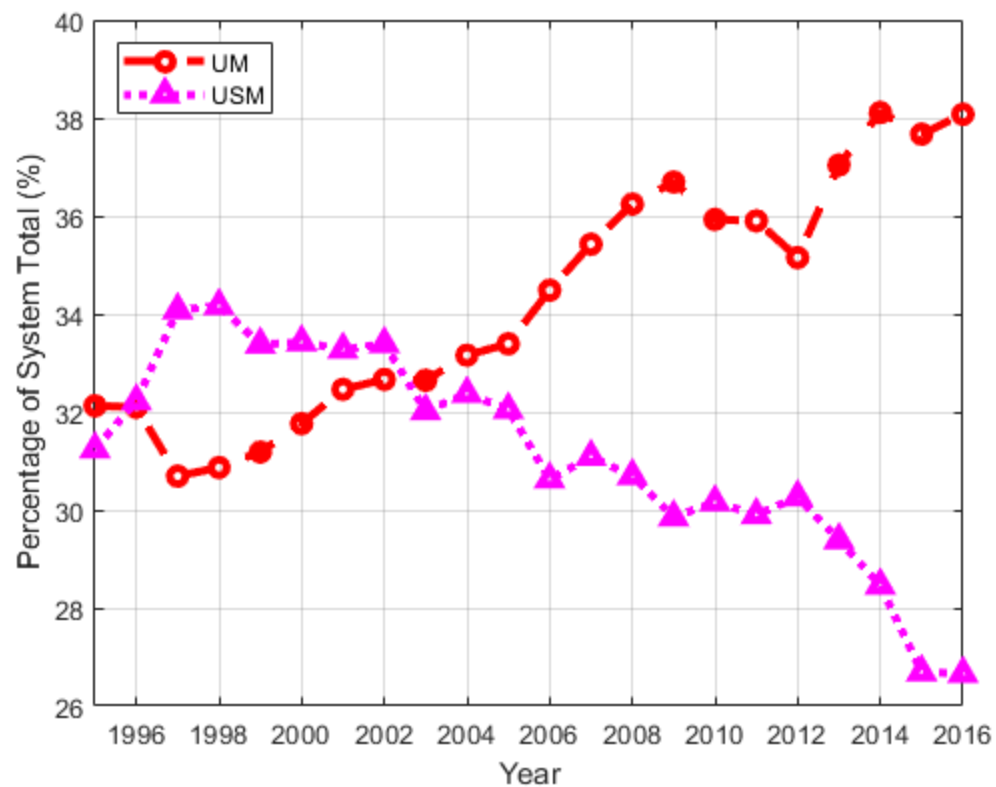
```

---

```

USMpercent = (usm ./ sum(enrollment([2:8], [1:end-1]))) * 100;
% Plot UM data, wait, then plot the USM data.
plot(year, 1000 * UMpercent, '--or', 'LineWidth', 3);
hold on;
plot(year, 1000 * USMpercent, ':m^', 'LineWidth', 3);
% Make the graph match the one in the HW.
grid on;
legend('UM', 'USM', 'Location', 'northwest')
xlim([1995 2016]);
xlabel('Year')
set(gca, 'XTick', [1996:2:2016]);
ylabel('Percentage of System Total (%)')

```



**Figure 3**

```

% Plot a stacked bar graph and line chart on top of each other.
figure(3);
% An array of the line chat data
data = [1000 * UMpercent; 1000 * USMpercent];

% Use plotyy for two different y axis values.
% ax is the axis information. ax(1) is bar chart. ax(2) is line
chart.
% hBar is the bar chart data.
% hLine is the line chart data.

```

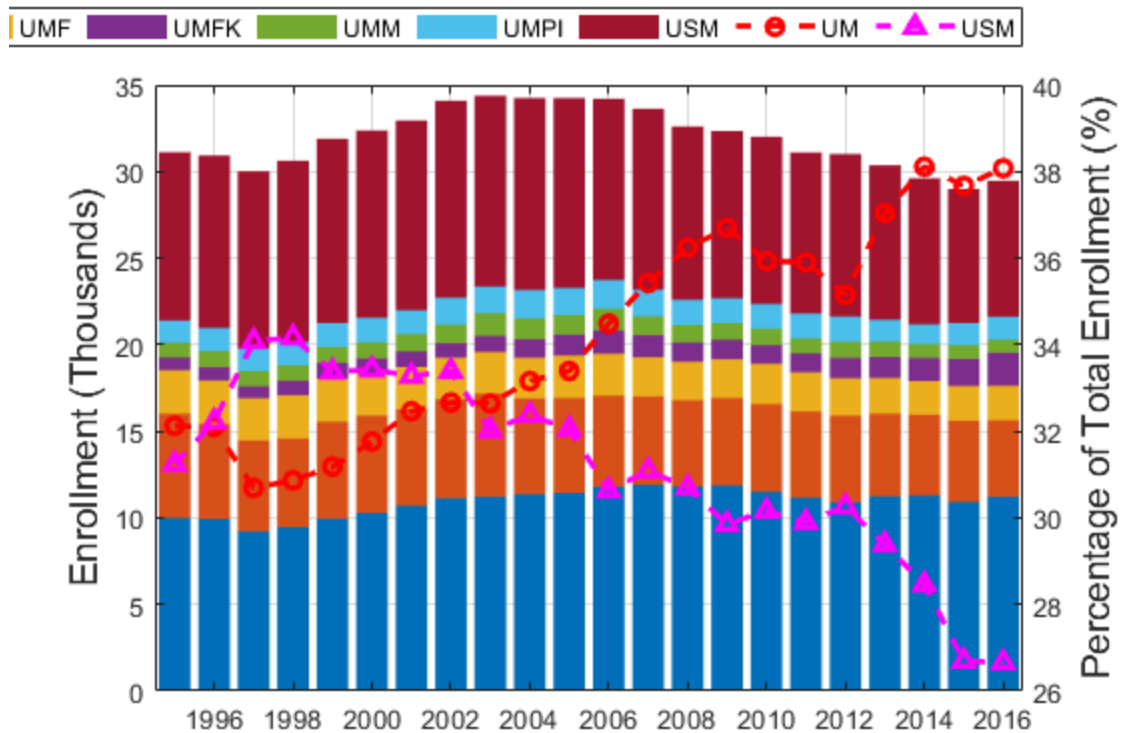
---

```
[ax, hBar, hLine] = plotyy(year, enrollment([2:8], [1:end-1])/1e3,
    year, data, 'bar', 'plot');
set(hBar, 'BarLayout', 'stacked');

% Make the appropriate Y axis labels.
ylabel(ax(1), 'Enrollment (Thousands)', 'FontSize', 14);
ylabel(ax(2), 'Percentage of Total Enrollment (%)', 'FontSize', 14);

% Make the lines of the line chart look correctly.
set(hLine(1), 'LineStyle', '--', ...
    'Marker', 'o', ...
    'Color', 'r', ...
    'LineWidth', 2);
set(hLine(2), 'LineStyle', '--', ...
    'Marker', '^', ...
    'Color', 'm', ...
    'LineWidth', 2);

% Now make the graph look like the HW.
grid(ax(1), 'on');
xlim(ax(1), [1994.5 2016.5]);
xlim(ax(2), [1994.5 2016.5]);
ylim(ax(1), [0, 35]);
ylim(ax(2), [26, 40]);
set(ax(1), 'YTick', 0:5:35);
set(ax(2), 'YTick', 26:2:40);
legend('UM', 'UMA', 'UMF', 'UMFK', 'UMM', 'UMPI', 'USM', 'UM', 'USM', 'Location',
xticks([1996:2:2016]));
```



**Figure 4**

```
figure(4);

% Get the year over year growth.
YOY = diff(um);
YOYyear = linspace(1996, 2016, 21);

% Plot the bar chart and line chart on top of eachother.
[ax, hBar, hLine] = plotyy(year, um, YOYyear, YOY *
    10, 'bar', 'plot');

% Make the appropriate Y axis labels.
ylabel(ax(1), 'Enrollment (Thousands)', 'FontSize', 14);
ylabel(ax(2), 'Year over year growth (%)', 'FontSize', 14);

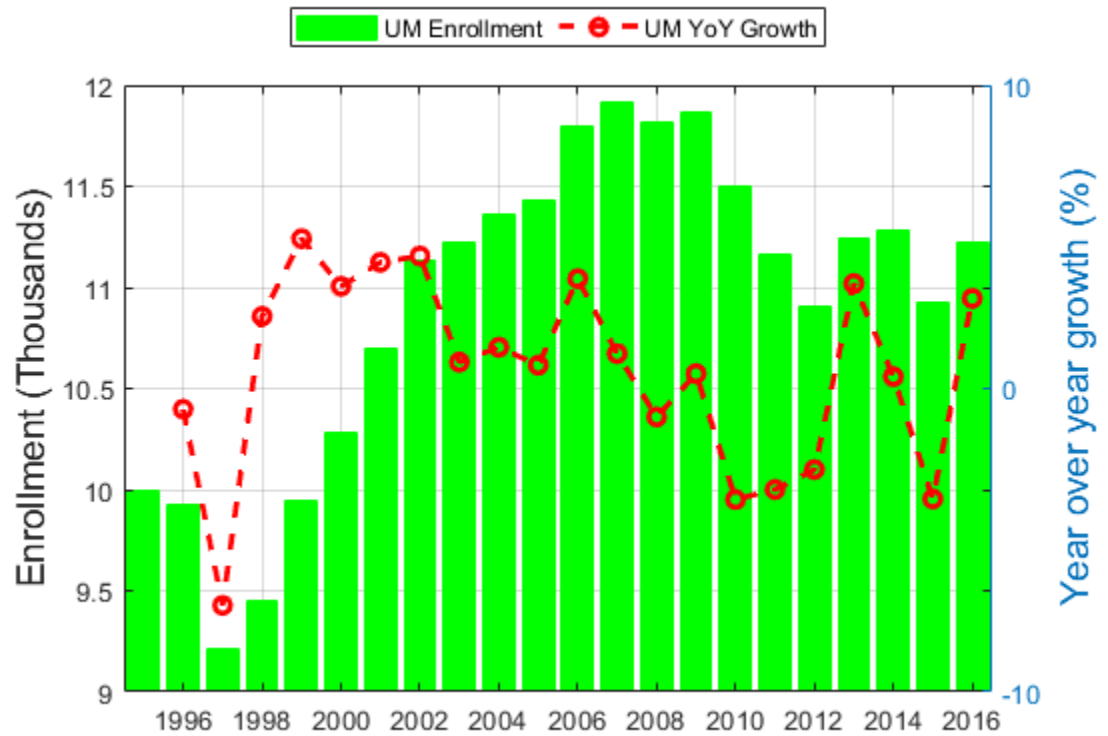
% Set the parameters of the line and bar chart.
set(hLine(1), 'LineStyle', '--', ...
    'Marker', 'o', ...
    'Color', 'r', ...
    'LineWidth', 2);
set(hBar(1), 'FaceColor', 'g', ...
    'EdgeColor', 'g');

% Set the axes to be correct.
```

```

grid(ax(1), 'on');
ylim(ax(1), [9, 12]);
ylim(ax(2), [-10, 10]);
yticks(ax(1), [9:.5:12]);
xlim(ax(1),[1994.5 2016.5]);
xlim(ax(2),[1994.5 2016.5]);
legend('UM Enrollment', 'UM YoY
      Growth', 'Location', 'northoutside', 'Orientation', 'horizontal');
xticks([1996:2:2016]);

```



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