```
clear

%Name: David
%Student ID: David George

table =  input_data();
%A)
    figure
    plot_data(table);

%B)
       figure
       plot_normality(table);

 %C)
      disp("PART C)..");
      [rejectBefore p]= Kolmogorv_Smirnov(table(table.game  < 40, :));
      if rejectBefore == 0
          disp("Before the 40th game, it is normal");

      else
          disp("Before the 40th game, it is NOT normal");
      end

       [rejectAfter p]= Kolmogorv_Smirnov(table(table.game  >=
 40, :));
      if rejectAfter  == 0
          disp("After the 40th game, it is normal");

      else
          disp("After the 40th game, it is NOT normal");
      end

 %D)
    % For a Z test to be conducted there are three condidions that
 must be
    %met. There must be: independance, normaility, and population
 standard
    %deviation must be known. Their is indepdance as points per game
 and
    %the game number are independant of eachother, one does not
 determine
    %the other. I.E, just becasuse it is the fist game, this does not
    %enttail a specifc ppg.
    %
    %There is normality as the qq plots depecit a roughly straight
 line,
    %histograms apoximatley follow the over laid nomral distrubtion,
    %and boxplots are symmetrical. This in conjunciton with
    %Kolmogorov-Smirnov test, which confimed normal distrubtuons
 before and
    %after the 40th game,makes the normal assumption valid.
```

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    %
    %
    %Lastly, the population standard deviation is known,as the data
 given
    %to us is not a sample, and represents the entirity of the last
 season,
    %thus the entire population. Therefore the standard deviation
    %calucalted is the population standard deviation.

    % Taken together (independance,normality, and known sigma) a Z-
test can
    % be conducted.
    %
    % Null Hypothesis: The Expected PPG is the same as the Expcted PPG
    % before and after the 40th game.


  %E)
    disp("PART E)...");
    testing(table);



function table = input_data()

    %Reading table, casting vaaribles to the correct type
    data= readtable("basketball-ppg.csv");
    data.game = double(data.game);
    data.ppg = double(data.ppg);
    table = data;
end

function plot_data(table_data)

    %Time Series of player's PPF as a funciton of game number
   plot(table_data.game, table_data.ppg);
   title(" Points per game (PPG) versus Games");
   xlabel("Game Number");
   ylabel("Points per game (PPG)");
   hold on

   %Dashed verticle line at the 40th game
   xline(40,'--r');

end


function plot_normality(table)

      %The following makes a subplot of the qq plots
      % The histograms
      % The boxplots
      % Before and after the 40th game to visually check for normality
```

```
        subplot(3, 4 , [1, 2]);
        qqplot(table.ppg(table.game < 40));
        subplot(3, 4 , [3,4]);
        qqplot(table.ppg(table.game >= 40));
        subplot(3,4,[5 , 6]);
        histfit(table.ppg(table.game < 40));
        title("Before 40th game");
        xlabel("Points per game");
        ylabel("frequencey");
        subplot(3,4,[7, 8]);
        histfit(table.ppg(table.game >= 40));
        title("After 40th game");
        xlabel("Points per game");
        ylabel("frequencey");

         subplot(3,4,[9 10 11 12]);
         x1 = table.ppg(table.game < 40);
          x2 = table.ppg(table.game >= 40);
          x = [x1;x2];
          g = [ones(size(x1)); 2*ones(size(x2))];

          boxplot(x,g);
          title("Points per Game before and after 40th game");
          ylabel('Points Per Game');
          xlabel("Games");
          set(gca,'XTickLabel',{'Before 40th Game','After 40th Game'});


end

function [reject p] = Kolmogorv_Smirnov(data)

    % H0: "the data is normally distributed"
    x = data.ppg;

    % Rescale x for Norm(0,1) comparison:
    xx = (x - mean(x)) / sqrt(var(x));
    [reject p] = kstest(xx, 'Alpha', 0.01);

end


function testing(data)

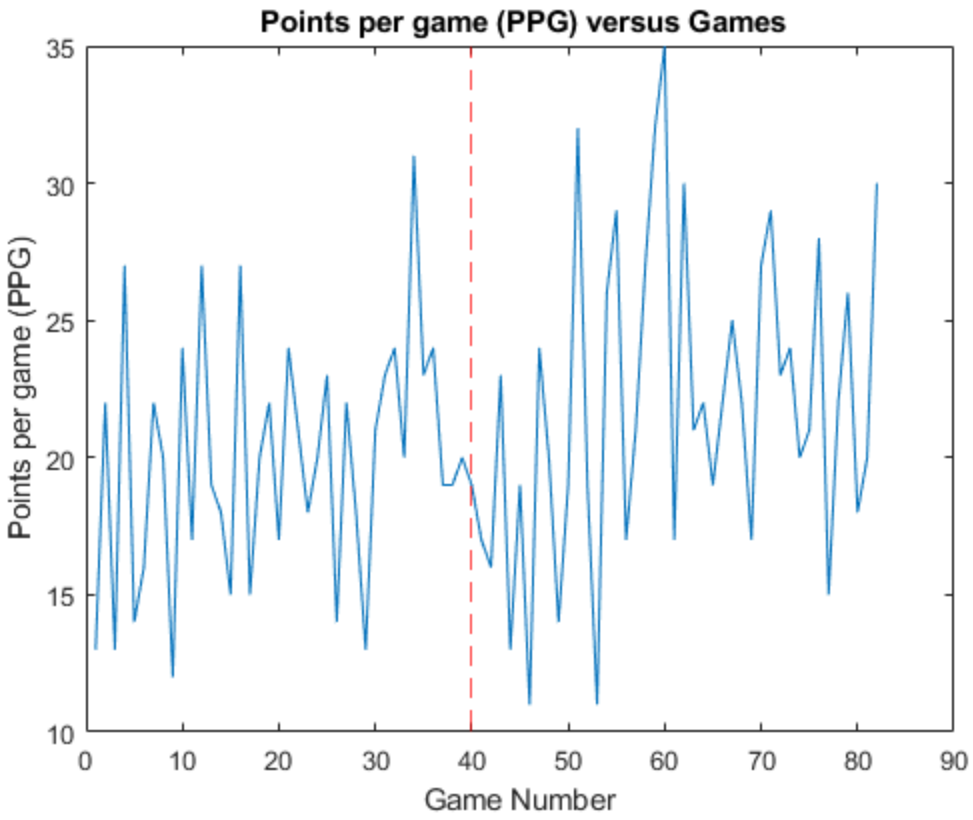

    %H0: Exptected points per game is the same, before and after the
 40th game

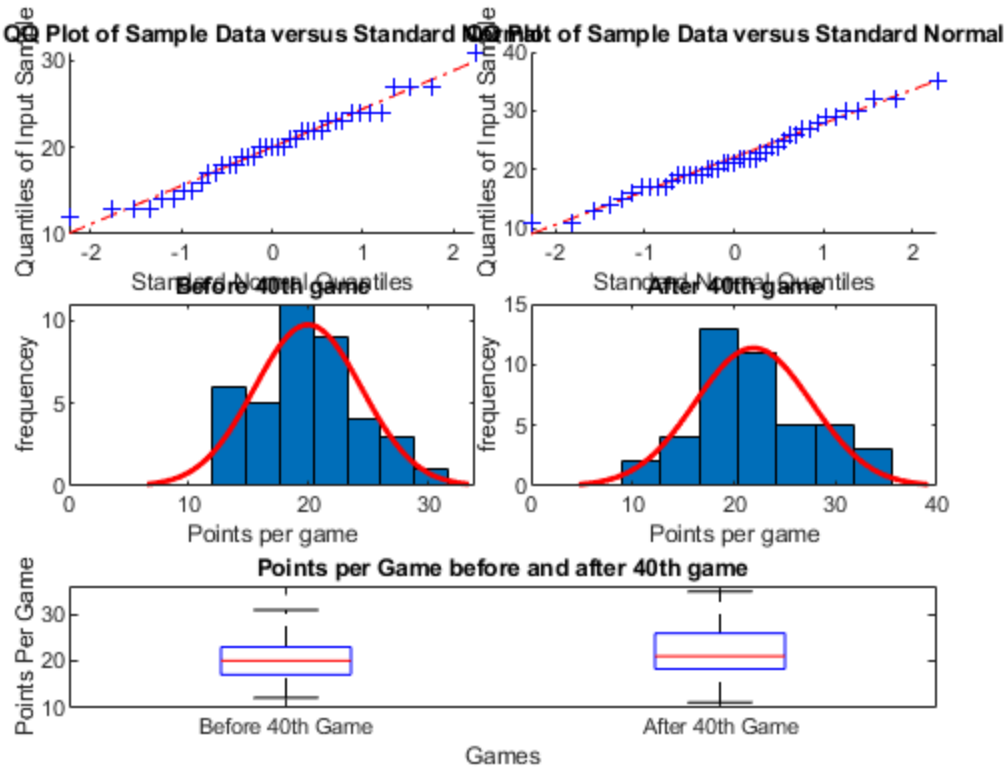
    hypothesis_test = ztest(data.ppg(data.game >= 40),
 mean(data.ppg(data.game < 40)),sqrt(var(data.ppg(data.game
 >=40))), "Alpha", 0.01);

    %If 0 then ztest fails to reject null hyptohesis
    %IF 1 then ztest rejects null hypothesis
```

```
    if hypothesis_test == 0
        disp("The null hypothesis is not rejected, therefore the
 average points before and after the 40th game are not signifacltly
 differnt. This result does NOT suport the league's suspiscion");
        return;
    end
    disp("The null hypothesis is  rejected, therefore the average
 points before and after the 40th game IS signifacltly differnt. This
 result DOES suport the league's suspiscion");
        return;
    end
```

PART C)..
Before the 40th game, it is normal
After the 40th game, it is normal
PART E)...
The null hypothesis is not rejected, therefore the average points before and after the 40th game are not signifacltly differnt. This result does NOT suport the league's suspiscion





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