```matlab
%% Lab 7 by Cole Bardin Section 62
%% Pacman Game!
%% Questions 1-2
clc, clear, close all

xcoords = [0, 1, 2, 3, 2, 3, 2, 1, 0];
ycoords = [2, 1, 1, 2, 2.5, 3, 4, 4, 3];
zcoords = [1, 1, 1, 1, 1, 1, 1, 1, 1];

pacman = [xcoords; ycoords; zcoords];

fill(pacman(1,:), pacman(2,:), 'y', 'LineWidth', 4)
axis([-1,5, -1, 5])
title("Cole's Pacman Image")
ylabel('y')
xlabel('x')

% Question 3
hold on
plot(2,3.25, 'o', 'MarkerSize', 20, 'MarkerFaceColor','k')

%% Questions 4-5
clc, clear, close all
translate = @(dx,dy) [1,0,dx;0,1,dy;0,0,1];
rotate = @(d) [cosd(d), -sind(d), 0; sind(d), cosd(d), 0; 0,0,1];
scale = @(k) [k, 0, 0; 0, k, 0; 0, 0, 1];

Q4 = [5;8;1];
translate(3,5)*Q4

V1 = rotate(30) * rotate(60) * [7;24;1]
V2 = rotate(90) * [7;24;1]

% Question 6
x_maze = [0, 25, 25, 0, 0, 15, 15, 5, 5, 20, 20, 0];
y_maze = [0, 0, 25, 25, 10, 10, 15, 15, 20, 20, 5, 5];

fill(x_maze, y_maze, 'cyan', 'LineWidth',4)
title("Pacman Maze")
xlabel("x")
ylabel("y")
axis([-5, 30, -5, 30])

%% Question 7
clc, clear, close all
xcoords = [0, 1, 2, 3, 2, 3, 2, 1, 0];
ycoords = [2, 1, 1, 2, 2.5, 3, 4, 4, 3];
zcoords = [1, 1, 1, 1, 1, 1, 1, 1, 1];

pacman = [xcoords; ycoords; zcoords];
x_maze = [0, 25, 25, 0, 0, 15, 15, 5, 5, 20, 20, 0];
y_maze = [0, 0, 25, 25, 10, 10, 15, 15, 20, 20, 5, 5];

translate = @(dx,dy) [1,0,dx;0,1,dy;0,0,1];
rotate = @(d) [cosd(d), -sind(d), 0; sind(d), cosd(d), 0; 0,0,1];
scale = @(k) [k, 0, 0; 0, k, 0; 0, 0, 1];
% a)
% Insert second Loop for the PACMAN maze
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x_maze = [ x_maze(1:6) x_maze+30 x_maze(7:12)];
y_maze = [ y_maze(1:6) y_maze+10 y_maze(7:12)];

% b)
% Insert 3rd and 4th Loops for PACMAN maze
x_maze = [ x_maze(1:12) x_maze+60 x_maze(13:24)];
y_maze = [ y_maze(1:12) y_maze+20 y_maze(13:24)];

f1 = figure(); % Handle for a new figure
mymap = [cool; hot; summer; jet]; % Combine more than one colormap for exotic effects
colormap(mymap)
% Enlarge figure to almost full screen.
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0.1, 0.1 0.9, 0.9])
% Plot your maze using fill and the fancy custom colormap named mymap
Cfill = rand(size(x_maze)); % random color fill using the colormap
fill(x_maze, y_maze, Cfill, 'LineWidth', 2, 'EdgeColor', 'red')
hold on % we will add more items soon.
% Fine tune the axes
ax = gca; ax.Color = [0, 0, 0.4]; % dark blue background
axis equal tight
axis([-5, 120, -5, 60])
set(gca, 'Color', 'black')

% Store and plot all eight turning points
TP = [22.5 22.5 2.5 2.5; 2.5 22.5 22.5 12.5]; % turning points in the first loop
TP = [TP, TP + [30;10], TP + 2*[30;10], TP + 3*[30;10]]; % concatenate with TPs in the↙
second loop

plot(TP(1,:), TP(2,:), 'h', 'MarkerSize',16, 'MarkerEdgeColor','b',↙
'MarkerfaceColor','y');
pacman_handle = fill(pacman(1,:),pacman(2,:),'y', 'LineWidth', 2);

black_jewel_handle = plot(105, 42.5, 'd', 'MarkerFaceColor','k', 'MarkerSize',20);

% add 24 bonus jewels
jewel_locations = [ 12.5 22.5 22.5 12.5 2.5 12.5; 2.5 7.5 17.5 22.5 17.5 12.5]; % the six↙
jewels in loop 1
jewel_locations = [ jewel_locations, jewel_locations + [30;10], jewel_locations + 2*[30;↙
10], jewel_locations + 3*[30;10] ]; % 6 more jewels in loop 2

% Add 12 more jewels in loops 3 and 4
% Just repeat the last line but using 2*[30;10]] instead.
% Bonus depends on color of each jewel
jewel_colors = ["red", "blue", "green", "magenta", "yellow", "cyan"];
jewel_colors = [jewel_colors jewel_colors jewel_colors jewel_colors]; % repeats four↙
times

jewels = []; % vector of handles for each jewel plot
% Plot all the bonus jewels using a for loop
for n = 1:numel(jewel_colors)
    x = jewel_locations(1,n); y = jewel_locations(2,n);
    h = plot(x, y, 'd', 'MarkerSize', 14, 'MarkerFaceColor', jewel_colors(n));
    jewels = [jewels, h];
end
% Add a display message near the bottom
text(40, 0, 'Jewels:', 'FontSize', 20, 'Color', 'red' )

% Question 8% Read each sound file in now so they will play quicker when we are ready.
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filename1 = "pacman_beginning.wav";
filename2 = "pacman_intermission.wav";

[music1,Fs1] = audioread(filename1);
[music2,Fs2] = audioread(filename2);

% Questions 9-10
clc, axis("off")
f1.Color = [0, 0, 0.4];
dx = 0.5; dy = 0.0;% Pacman starts out moving directly to the right.
current_pacman = pacman;
pacman_center = [1.5; 2.5]; % center point of the Pacman figure
score = 0; % points awarded for gobbling jewels
void = [22.5 ; 12.5]; voids = [void void+[30;10] void+[60;20]]; % the three voids
jewel_count = 0; % number of jewels gobbled down by PACMAN
for i =1:1000 % This is more than enough moves.
    current_pacman = translate(dx, dy) * current_pacman;
    pacman_center = pacman_center + [dx; dy];

    % Handle bonus jewels (excludes the final black jewel)
    [~,index] = ismember(pacman_center',jewel_locations','rows');
    if index > 0
        jewel = jewels(index);
        x = jewel_locations(1, index); y = jewel_locations(2, index);
        jewel_color = jewel.MarkerFaceColor;
        score = score + 10*sum(jewel_color);
        fprintf('Found a %s jewel at location [%.1f, %.1f] Reward: + %d\n', jewel_colors↙
(index), x, y, 10*sum(jewel_color))
        pacman_handle.FaceColor = jewel_color;
        title_message = strcat("PACMAN SCORE: ", int2str(score) );
        title(title_message, 'Color', 'magenta')
        jewel_count = jewel_count + 1;
        plot(60 + 5*mod(jewel_count-1,6), 5* floor((jewel_count-1)/6), 'd', 'MarkerSize',↙
14, 'MarkerFaceColor', jewel_color);
        delete(jewel)
        pause(0.4) % extra time delay when a jewel is gobbled
    end
    pause(0.1) % Time delay to create the illusion of an animation.
    delete(pacman_handle)

    % Students just need to add code here for crossing the void.
    % Pacman earns 100 points on each crossing of the voids
    if ismember(pacman_center', voids', 'rows')
        % Add code here to handle crossing the void
        % 1. Increase the score by 100
        score = score + 100;
        % 2. Update the title message and display it in the title in magenta
        title_message = strcat("PACMAN SCORE: ", int2str(score) );
        title(title_message, 'Color', 'magenta')
        % 3. Using fprintf, display the requested message in the command window.
        fprintf("Reward for crossing the void: +100 points\n");
        % 4. Play music1 using the sound command.
        sound(music1, Fs1);
        pause(0.4) % extra time delay when a void is crossed
    end

    % Handle the turning points.
    % First check if Pacman has arrived at a turning point, all of which
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    % are stored in the array TP. If yes, rotate counter-clockwise by 90
    % degrees.

    if ismember(pacman_center',TP','rows')
        % Rotate direction of motion 90 degress counter-clockwise
        new_direction = rotate(90) * [dx; dy; 1];
        dx = new_direction(1); dy = new_direction(2);

        % Rotate Pacman 90 degrees counter-clockwise
        x = pacman_center(1); y = pacman_center(2); % Get pacman coordinates.
        current_pacman = translate(x, y)*rotate(90)*translate(-x, -y) * current_pacman;
        pacman_handle = fill(current_pacman(1, :), current_pacman(2, :), 'yellow',↙
'LineWidth', 2);
        % Handle finding the large black jewel. End of the game! Success!!!
    elseif isequal(pacman_center, [105; 42.5])
        % DONE!! SUCCESS!! Pacman found the magic BLACK jewel!
        score = 2 * (score + 50); % Instant 50 points. Then entire score is doubled!
        fprintf('Magic black crystal doubles your score to %d\n',score )
        delete(black_jewel_handle)
        pacman_handle = fill(current_pacman(1, :), current_pacman(2, :), 'yellow',↙
'LineWidth', 2);
        title_message = strcat('CONGRATULATIONS! SCORE DOUBLED: ', {' '}, int2str↙
(score));
        title(title_message, 'Color', 'magenta')
        fprintf('Congratulations! Pacman has found the magic BLACK crystal and won his↙
eye!\n')
        eye = [0.5; 0.75] + pacman_center; % Give Pacman an eye as a reward!
        plot( eye(1),eye(2), 'bo', 'MarkerFaceColor', 'black', 'MarkerSize', 4)
        break % Game Over!
    else
        pacman_handle = fill(current_pacman(1, :), current_pacman(2, :), 'yellow',↙
'LineWidth', 2);
    end
end

% Have Pacman flash to celebrate victory!
for n = 1:21 % Flash 21 times
    pause(0.1) % Time delay to create the illusion of flashing.
    delete(pacman_handle)
    if mod(n,2)==0
        pacman_handle = fill(current_pacman(1, :), current_pacman(2, :), 'blue',↙
'LineWidth', 2);
    else
        pacman_handle = fill(current_pacman(1, :), current_pacman(2, :), 'yellow',↙
'LineWidth', 2);
    end
    plot( eye(1),eye(2), 'bo', 'MarkerFaceColor', 'blue', 'MarkerSize', 4) % Redraw the↙
eye
end

% At the end of the game, play the second PACMAN music sound.
sound(music2,Fs2);
```