Table of Contents


```
function [height_cone, weight_cone] =
 PS06_salt_cone_koike_lee2219(cone_width);

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% ENGR 132
% Program Description
% Create seven (7) variables and set them equal to the values provided
 in
% the problem setup: cone width, number of conical piles, angle of
% repose, and density of salt. On calculating user defined functions
% will be implemented to calculate the height and the weight of the
% cone piles.
%
% Function Call
% [coneHeight, coneWeight] = PS06_salt_cone_koike_lee2219(cone_width);
%
% Input Arguments
%  1. diameter is the given diameter or width of the cone
%
% Output Arguments
%  1. coneHeight: is the calculated height of the cone
%  2. coneWidth: is the calculated weight of the cone
%
% Assignment Information
%   Assignment:   PS 06, Problem 1
%   Team ID:   002-08
%   Paired Partner:  Tomoki Koike , koike@purdue.edu
%   Paired Partner:  Eu Jin Lee, lee2219@purdue.edu
%   Contributor:  no contributor
%   Our contributor(s) helped us:
%     [ ] understand the assignment expectations without
%         telling us how they will approach it.
%     [ ] understand different ways to think about a solution
%         without helping us plan our solution.
%     [ ] think through the meaning of a specific error or
%         bug present in our code without looking at our code.
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```

INITIALIZATION

```
% Create seven variables

angle_repose = 32;              %the angle of the natrually formed
 slope of salt pile, aka angle of repose (degrees)
density_salt = 80;              %the density of salt (lb/ft^3)
```

CALCULATIONS

```
% Convert salt density to (metric ton)/m^3 using the conversion
% constants: 1 kg = 2.2 lb, 1 mt = 1000 kg, 1 m = 3.3 ft
% mt stands for metric tons
lb_to_kg = 2.2;
        %conversion of one kilogram per one pound (lb/kg)
kg_to_mt = 10^(-3);
        %conversion of one kilogram to metric tons (mt/kg)
cubic_ft = 3.3^3;
        %cubic foot per cubic meter (ft^3/m^3)
density_salt_metric = density_salt / lb_to_kg * kg_to_mt * cubic_ft;
        %density of salt (mt/m^3)

% height, volume, and weight of salt in a single conical pile
%calculation of the height
tangent_angle = tand(angle_repose);
        %the tangent value of the angle of repose
height_cone = cone_width * tangent_angle / 2;
        %height of one conical pile (m)

%calculation of the volume
volume_cone = pi * cone_width^2 * height_cone / 12;
        %volume of one conical pile (m^3)

%calculation of the weight
weight_cone = density_salt_metric * volume_cone;
        %weight of one conical pile (mt)
```

FORMATTED TEXT & FIGURE DISPLAYS

```
% Print the height and weight of one conical pile to the Command
 Window
% using one print command. Use language appropriate for technical
 communication.
```

```
% Display the height with 2 decimal place to the command window.
fprintf("The height of one conical pile is %.2f meters. \n" ,
 height_cone);

% Display the weight with 1 decimal place to the command window.
fprintf("The weight of one conical pile is %.1f metric tons. \n" ,
 weight_cone);
```

```
The height of one conical pile is 6.72 meters.
The weight of one conical pile is 1062.3 metric tons.
```

COMMAND WINDOW OUTPUT

[coneHeight, coneWeight] = PS06_salt_cone_koike_lee2219(cone_width);

```
%cone_width = 21.5
%
%cone_width =
%
%   21.5000
%
%[heigth_cone,weight_cone] = PS06_salt_cone_koike_lee2219(cone_width);
%The height of one conical pile is 6.72 meters.
%The weight of one conical pile is 1062.3 metric tons.
%
%heigth_cone =
%
%    6.7173
%
%
%weight_cone =
%
%   1.0623e+03
%
%
```

ACADEMIC INTEGRITY STATEMENT

We have not used source code obtained from any other unauthorized source, either modified or unmodified. Neither have we provided access to our code to another. The function we are submitting is our own original work.

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