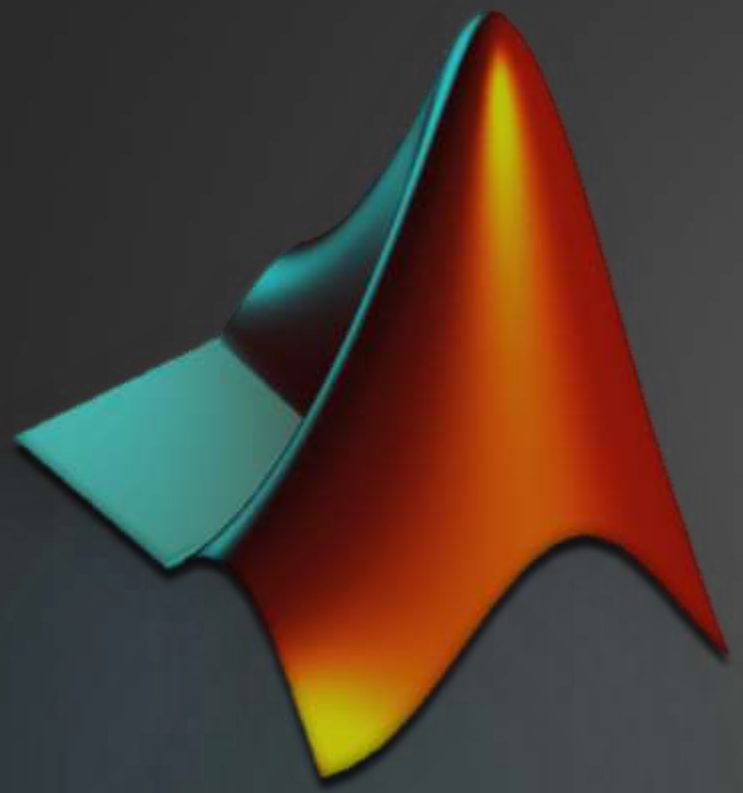

TANK OVERFLOW

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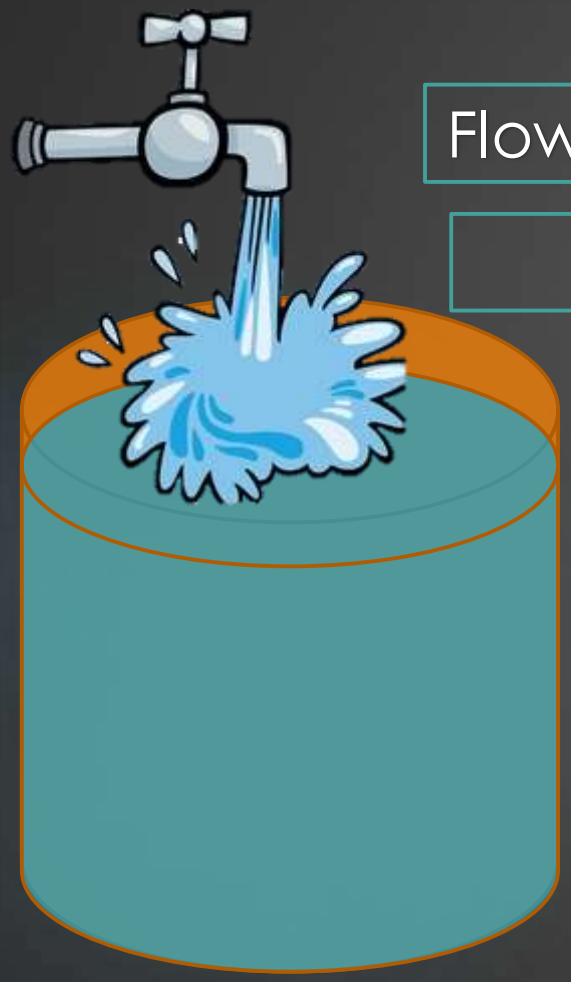
Tank Overflow Concept

- Water flowing into the tank much faster for a certain amount of time can overflow from the tank.
- By using MATLAB we can determine whether a tank of a certain size will overflow in a specific amount of time.

Will it overflow?



Flow rate, F =10 m^3/min

Time, t=120 min

Height, h = 10m

Radius, r = 5m

V_tank= $\pi r^2 h$

V_liquid= Ft

Code

```
clear all;

r = 5;
h = 10;
F = 10;
pi = 3.1416;
t = 120;

V_tank = pi * r^2 * h;
V_liq = F * t;

V_tank
V_liq

if V_liq > V_tank
     disp(['Overfilled Tank by '  num2str(V_liq-V_tank)])
else
    disp('Tank not Overfilled')
end
```

Output

Tank_Overflow_Detection.m

```
1  clear all;
2
3  r = 5;       %radius(m)
4  h = 10;      %height(m)
5  F = 10;      %flow rate(m^3/min)
6  pi = 3.1416;
7  t = 120;     %time(min)
8
9  V_tank = pi * r^2 * h;
10 V_liq = F * t;
11
12 V_tank
13 V_liq
14
15 if V_liq > V_tank
16      disp(['Overfilled Tank by '  num2str(V_liq-V_tank)])
17 else
18     disp('Tank not Overfilled')
19 end
20
```

Current Folder

Workspace

```
>> Tank_Overflow_Detection

V_tank =

  785.4000


V_liq =

        1200

Overfilled Tank by 414.6
>>
```

What happens in case of spherical container?

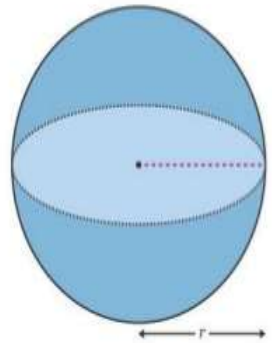
Tank_Overflow_Detection.m

```
1 -    clear all;
2 -    r = 5;       %radius(m)
3 -    F = 10;      %flow rate(m^3/min)
4 -    pi = 3.1416;
5 -    t = 120;     %time(min)
6
7 -    V_tank =4/3 * pi * r^3 ;
8 -    V_liq = F * t;
9
10 -   V_tank
11 -   V_liq
12
13 -   if V_liq > V_tank
14 -        disp(['Overfilled Tank by '  num2str(V_liq-V_tank)])
15 -   else
16 -       disp('Tank not Overfilled')
17 -   end
18
19
```

Volume of a Sphere

The volume of a sphere is given by the following formula:

$$V = \frac{4\pi r^3}{3}$$



Output

```
>> Tank_Overflow_Detection

V_tank =

  523.6000


V_liq =

        1200

Overfilled Tank by 676.4
>>
```

The container will overflow with greater amount than
that of a cylindrical container

Importance

- make handling the water storage system considerably more comfortable and easy.
- Prevent the wastage of water

THANK YOU