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Assignment 3

Zagrodzki; CSCI 1320-112

Assignment 3 – Vector and Matricies

**Task 1) Column Vector Generation**

1. Colon Operator
   1. colvec1 = (-18:-12)';
   2. colvec2 = (8:4:16)';
   3. colvec3 = (16:-6:4)';
2. Linspace
   1. colvec1 = linspace(-18,-12,7)';
   2. colvec2 = linspace(8,16,3)';
   3. colvec3 = linspace(16,4,3)';

**Task 2) Efficient Matrix Generation**

>> M =  13      10       7

           1        5        9

          30      20      10

           5       15      25

>> M = [linspace(13,7,3);linspace(1,9,3);linspace(30,10,3);linspace(5,25,3)];

1. >> m1 = M(4,3);
2. >> m2 = M(:,3);
3. >> m3 = M([[1:2]+[5:6]+[9:10]]);

**Task 3) Find and Eliminate**

>> vec = [-11, 5, 3, 2, -18, 4, -5, 5, -66];

1. Find function

>> vec = vec(find(vec>0));

1. Logical Vectors Method

>> vec = vec(vec>0);

**Task 4) Transpose Matrix**

>> x = [1 2 3; 1 2 1; 3 5 1];

Transposemat function

function y = transposemat(x);

%transposemat(x) returns the transpose of matrix x

r1 = [x(1,1);x(1,2);x(1,3)];

r2 = [x(2,1);x(2,2);x(2,3)];

r3 = [x(3,1);x(3,2);x(3,3)];

y = [r1,r2,r3];

end

>> transposemat([1 2 3; 1 2 1; 3 5 1])

ans =

1 1 3

2 2 5

3 1 1

>> disp(transposemat([1 2 3; 1 2 1; 3 5 1]))

1 1 3

2 2 5

3 1 1

**Task 5) Easter Sunday**

% Henry Meyerson

% Easter Sunday Calculator

% Assignment 3 - Task 4

% Set Year

y = input('Please enter the year: ');

% Math

% Step 2

a = mod(y,19);

% Step 3

b = fix(y/100);

c = mod(y,100);

% Step 4

d = fix(b/4);

e = mod(b,4);

% Step 5

g = fix((8 \* b + 13)/25);

% Step 6

h = mod(19 \* a + b - d - g + 15, 30);

% Step 7

j = fix(c/4);

k = mod(c,4);

% Step 8

m = fix((a+11\*h)/319);

% Step 9

r = mod((2 \* e + 2 \* j - k - h + m + 32),7);

% Step 10

n = fix((h - m + r + 90)/25);

% Step 11

p = mod((h - m + r + n + 19),32);

% Print Out

fprintf('In %d, Easter Sunday fell on %d/%d.\n',y,n,p)

**Task 6) throwBall\_func.m**

function p = throwBall\_func(v, a, M)

h = 1.5; %Starting height of 1.5 meters

g = 9.8; %Gravity Defines at 9.8 m/s/s

t = linspace(0,M,10000);

y = h + (v \* sin(a \* pi/180) \* t) - (0.5 \* g \* t.^2);

p = ~isempty(find(y<0));

end