Øving 10 Datateknikk

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March 17, 2019

Oppgave 1 - Practice-oppgaver

```
%Practice 8.1

%Creating two different cell arrays:
cellA={1:5,'Random input', 12; 5.43,"Random string", 9}
cellB={13,20;16,'March'};

%Creating expression
test1=cellA{randi(size(cellA,1)),randi(size(cellA,2))};

clear all

%Creating a function based on earlier expression
function randomCell(inputCell)

inputCell{randi(size(inputCell,1)),randi(size(inputCell,2))}
end

%Practice 8.2

%Creating structure
onepart=struct('part_no',123,'quantity',4,'costper',33.95);

fprintf('$%.2f\n',onepart.costper);

clear all
```

```
%Practice 8.3

%Creating vector 'parts'

parts(3)=struct('partno',106,'quantity',20,'costper',7.5);
parts(1)=struct('partno',123,'quantity',4,'costper',33);
parts(2)=struct('partno',142,'quantity',1,'costper',150);

%Printing Item id and total cost
fprintf('\n  Item# Cost\n\n')
for i=1:length(parts)
    fprintf('%6d ...
        %6.2f\n',parts(i).partno,parts(i).costper*parts(i).quantity);
end

clear all
```

```
%Practice 8.4
%Modify function
function printcylvols(cyls)
for i=1:length(cyls)
    [vol,sA]=cylvol(cyls(i).dimensions);
    fprintf('Cylinder %c has a volume of %.1f in ^3,\n and a ...
        surface area of %.2f\n',cyls(i).code,vol,sA);
end
end



function [cvol,sArea]=cylvol(dims)

cvol=pi*dims.rad^2*dims.height;
sArea=(2*pi*dims.rad^2)+(2*pi*dims.rad*dims.height);


end

%Testdata
cyls(3)=struct('code','c','dimensions',struct('rad',3,'height',6),
'weight',9);
cyls(1)=struct('code','a','dimensions',struct('rad',2,'height',3),
'weight',5);
cyls(2)=struct('code','b','dimensions',struct('rad',4,'height',4),
'weight',6);
```

Oppgave 2- Celle-array

```
%Oppgave 2a

function nCell= celleT(iCel)

nCell=iCel;
for i=1:size(iCel,1)
    for y=1:size(iCel,2)
        if iCel{i,y}=='n'
            nCell=lower(cellstr(iCel));
            elseif iCel{i,y}=='o'
                nCell=upper(cellstr(iCel));
        end
    end
end
```

```
%Oppgave 2b

nCell={};
for n=1:4;
    x=input(['Input string with a length of ' num2str(n) ' ...
        elements: '],'s');
    if length(x)==n & isstrprop(x,'alpha')
        nCell(end+1)=cellstr(x);
    else if ¬isstrprop(x,'alpha')
            error('Not a string. Try again');
        else
            while length(x)≠n
                disp('Wrong. Try again.');
                fprintf('\n');
                x=input(['Input string with a length of ' ...
                    num2str(n) ' elements: '],'s');
            end
                nCell(end+1)=cellstr(x);
        end
    end
end

nCell

clear all
```

```
%Oppgave 2c

function output = abc(x,n) %x is a single letter, n is an int

out=[];
output={};

for i=0:n-1
    c1=double(x)+i;
    c2=char(c1);

    out=[out,c2];
    output(end+1)=cellstr(out);


end

disp(output);
```

Oppgave 3 -Strukturer

```
%Oppgave 3a

%Creating structure
sylindre(3)=struct('dimensjon',struct('radius',3,'hoyde',6),'vekt',
9,'kode','c');
sylindre(1)=struct('dimensjon',struct('radius',3,'hoyde',6),'vekt',
7,'kode','x');
sylindre(2)=struct('dimensjon',struct('radius',4,'hoyde',2),'vekt',
5,'kode','a');
```

```
%Function – Oppgave 3a
%Merk:Lignende oppgave. Samme funksjon benyttet.

function volar(cyls)

for i=1:length(cyls)
    [vol,sA]=cylvol(cyls(i).dimensjon);
    fprintf('Cylinder %c has a volume of %.1f cm^3,\n and a ...
        surface area of %.2f cm.\n',cyls(i).kode,vol,sA);
end
end


function [cvol,sArea]=cylvol(dims)

cvol=(pi*dims.radius^2*dims.hoyde);
sArea=(2*pi*dims.radius^2)+(2*pi*dims.radius*dims.hoyde);

end
```

```
%Oppgave 3b
%Loads datafile and creates a structure.
%Calculate average
x=load('quiz.dat');

x1=int16(x(:,1));
x2=x(:,2);
x3=x(:,3);
x4=x(:,4);

[r c] = size(x);

for i=1:r
    studenter(i)=struct('id_no',x1(i),'quiz',[x2(i) x3(i) x4(i)]);
    fprintf('Average score for student #%d is ...
        %.2f.\n',studenter(i).id_no,mean(studenter(i).quiz));

end
```