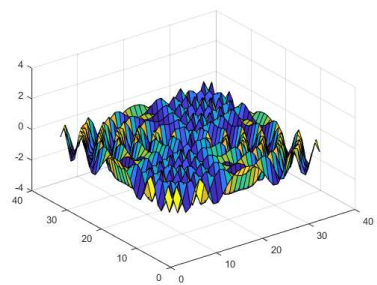
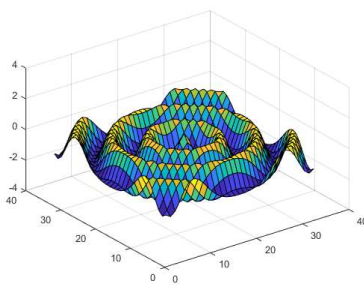
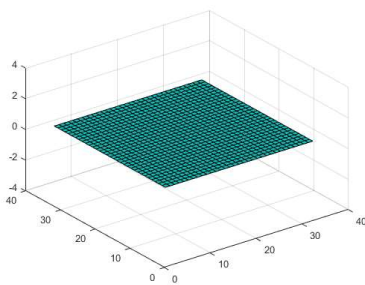


Oliver Cabral, Omar Fayoumi

Problem 1.2: Chapter 1

```
1  %{
2  Name: Assignment 1: Problem 1.2
3  Date: 09/04/2023
4  Class: CECS 271
5  Instructor: Minhthong Nguyen
6  Purpose: In this problem, we are tasked to modify the script given in
7  Section 1.2.5 in order to learn various functionalities in MATLAB such as using
8  for loops, pause, and math functions.
9  Last updated: 09/05/2023
10 %}
11
12 %Code provided in Section 1.2.5
13 [x y] = meshgrid(-8 : 0.5 : 8);
14 r = sqrt(x.^2 + y.^2) + eps;
15
16 % Modified per instructions in part A
17 % for n=-3:0.05:3;
18 for n=-4:0.05:4;
19
20     %Modified per instructions in part C
21     %z=sin(r.*n)./r;
22     z=cos(r.*n);
23
24     surf(z), view(-37, 38), axis([0,40,0,40,-4,4]);
25
26     % Modified based on instructions in part B
27     %pause(0.05)
28     pause(0.1);
29 end
```



From top left to bottom right : a) $n = 0$; b) $n = 2$ and -2 ; c) $n = 4$ and -4

Problem 2.11: Chapter 2

```
1  %{
2  Name: Assignment 1: Problem 2.11
3  Date: 09/05/2023
4  Class: CECS 271
5  Instructor: Minhthong Nguyen
6  Purpose: a) A script that converts Celsius to Fahrenheit that also gives
7  a special comments based on the temperature. b) A script that uses vectors
8  and array operations to computer Fahrenheit equivalents of Celcius
9  temperature ranging from 20 degrees to 30 degrees in 1 degrees increment.
10 Last updated: 09/05/2023
11 %}
12
13
14 %Part A; Line 14 to 29
15 c = input("Enter temperature in Celsius: ");
16 f = (c*9/5) + 32;
17
18 %Checking if Celcius is a "special" value
19 if c == -40
20     disp("The Fahrenheit temperature is " + num2str(f) + ": Only value where Farenheit = Celsius!");
21 elseif c == -100
22     disp("The Fahrenheit temperature is " + num2str(f) + ": Boiling point of water!");
23 elseif c == -37
24     disp("The Fahrenheit temperature is " + num2str(f) + ": Normal human temperature");
25 elseif c == 5526
26     disp("The Fahrenheit temperature is " + num2str(f) + ": Temperature of the Sun's surface")
27 else
28     disp("The Fahrenheit temperature is " + f)
29 end
30
31 %Part B: Line 31-35
32 format bank
33 % Create 2 arrays containing temps in C and calculate for F in 2nd array (B)
34 A = [20:1:30];
35 B = [(A*9/5) + 32];
36 T = table(A',B', 'VariableNames', ["Celsius", "Fahrenheit"]);
37 disp(T)
```

```
Enter temperature in Celsius: 1
The Fahrenheit temperature is 33.8
```

Celsius	Fahrenheit
20.00	68.00
21.00	69.80
22.00	71.60
23.00	73.40
24.00	75.20
25.00	77.00
26.00	78.80
27.00	80.60
28.00	82.40
29.00	84.20
30.00	86.00

Problem 2.25: Chapter 2

```
1  %{
2  Name: Assignment 1: Problem 2.25
3  Date: 09/05/2023
4  Class: CECS 271
5  Instructor: Minhthong Nguyen
6  Purpose: A program that displays the interest rate, amount of interest,
7  balance of a savings account given in exercise 2.25 in Essential MATLAB for
8  Engineers and Scientists (6th Edition)
9  Last updated: 09/05/2023
10 %}
11
12
13 %Preallocating memory to a matrix. Each column contains the month, interest
14 %rate, amount of interest, and new balance in order from left to right.
15 grid = zeros(12,4);
16 balance = 100000;
17
18 for month = [1:1:12]
19     grid(month,1) = month;
20
21     if balance < 110000
22         grid(month,2) = 0.01;
23     elseif balance <= 125000
24         grid(month,2) = 0.015;
25     else
26         grid(month,2) = 0.02;
27     end
28
29     grid(month,3) = grid(month,2) * balance;
30     grid(month,4) = grid(month,3) + balance + 1000;
31     balance = grid(month,4)
32 end
```

```

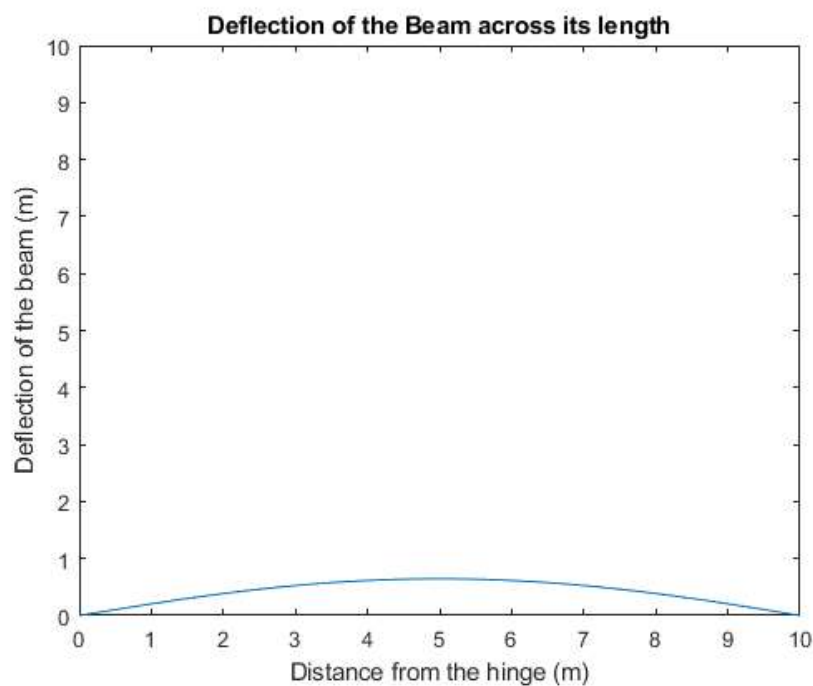
33
34 format bank
35 colname = {'Month', 'Interest Rate', 'Amount of Interest', 'New Balance'}
36 T = array2table(grid, 'VariableNames', colname)
37
38 disp(T)

```

Month	Interest Rate	Amount of Interest	New Balance
1.00	0.01	1000.00	102000.00
2.00	0.01	1020.00	104020.00
3.00	0.01	1040.20	106060.20
4.00	0.01	1060.60	108120.80
5.00	0.01	1081.21	110202.01
6.00	0.01	1653.03	112855.04
7.00	0.01	1692.83	115547.87
8.00	0.01	1733.22	118281.08
9.00	0.01	1774.22	121055.30
10.00	0.01	1815.83	123871.13
11.00	0.01	1858.07	126729.20
12.00	0.02	2534.58	130263.78

Problem 4.8: Chapter 4

```
1  %{
2  Name: Assignment 1: Problem 4.8
3  Date: 09/06/23
4  Class: CECS 271
5  Instructor: Minhthong Nguyen
6  Purpose: Calculate the deflection across a beam with a uniform load
7  Last Update: 09/07/2023
8  %}
9
10 %generate the x-axis data points a vector from 0 to 10 with a step size of 0.1
11 % a = sqrt(0.1)
12 % W EI/T^2 = 1 so we don't need to include it
13
14
15 % Formula: num/den + wx*lx
16 x = 0:0.1:10;
17 num = cosh(sqrt(0.1)*(5-x(:)));
18 den = cosh(sqrt(0.1)*5);
19 wx = 0.05*x(:);
20 lx = 10 - x(:);
21 y = (num(:)./den(:) - 1) + wx(:).*lx(:);
22
23 % Plot the y vs x graph
24 plot(x,y)
25 axis([0 10 0 10]) %
26 title("Deflection of the Beam across its length")
27 xlabel("Distance from the hinge (m)")
28 ylabel("Deflection of the beam (m)")
```



Problem 5.7: Chapter 7

```
1  %{
2  Name: Assignment 1: Problem 5.7
3  Date: 09/06/23
4  Class: CECS 271
5  Instructor: Minhthong Nguyen
6  Purpose: Calculate the cost of electricity used per residence
7  Last Update: 09/07/2023
8  %}
9
10 res = [200; 500; 700; 1000; 1500];
11 cost = calculateElectricityCost(res);
12 report = [res, cost]
13
14 % Calculates electricity cost based on x units
15 function cost = calculateElectricityCost(x)
16     s = size(x);
17     cost = [1:1:size(x)];
18     for c = 1:size(x)
19         if(x(c) <= 500)
20             cost(c) = x(c)*.02 + 5;
21         elseif(x(c) <= 1000)
22             cost(c) = 15 + ((x(c)-500)*.05);
23         else
24             cost(c) = 40 + ((x(c)-1000)*.1);
25         end
26     end
27     cost = cost';
28 end
29
```

report =

200	9
500	15
700	25
1000	40
1500	90