

## ENG6 SQ 2016

### Lab 4

#### Section A07

**Monday 7:10pm – 8:00pm**

**Submission ends at 8:00pm sharp!**

Please create a script (.m file) and save as LA#P#\_XXX.m where XXX = your initials and # = lab number and problem number.

**At the top of script file, put the following comments:**

% <ENG 6, SQ16 Lab number>

% <First Name, Last Name>

% <ID Number>

% <Section Number>

**\* Submit only one MATLAB script (.m), containing all problems onto Smartsite.**

**Create sections for different problems by using appropriate comments (e.g., %% Problem 1).**

- Use relevant and precise comments within your script to explain your steps.
- Use the function '***disp()***' or '***fprintf()***' to display answers or output for each task.  
(Do not leave off semi-colons from your lines of code to print out answers.)

**When submitting your script, make sure to:**

- **Submit 1 (.m file) before the end of the lab time. Your submission will include a timestamp – any late submission will not be graded!**  
If your section ends at 8:00 PM, submit by 7:59 PM.
- **Click the honor pledge, or else your lab will not be submitted.**

**Reminder: Completion of weekly reading activities (of online textbook) is part of your lab grade.**

**\*\* No discussion or online resources (except online textbook) is allowed.**

**Use MATLAB doc (type *help* with specific function name for quick review) for help.**

A company rents out solar panels to its customers. The company makes money by

- 1) charging each customer a monthly rental fee, and
- 2) selling the unused electricity from each customer back to the electricity company.

The panels are rented out to customers according to the rules below:

- 1) For each customer: **Total energy available for sale** = total **energy generated** – total **energy consumed**
- 2) The company's monthly income (revenue): Monthly revenue = **rental fee** + 80% \* **total energy available for sale** \* **cost per kWh**

Assume the company has 17 customers, and their energy usage as shown in table below.

Customer	Average <b>Energy Consumed</b> Each Month (kWh)	Customer	Average <b>Energy Consumed</b> Each Month (kWh)
1	200	11	310
2	170	12	370
3	150	13	380
4	260	14	50
5	120	15	430
6	430	16	180
7	300	17	400
8	320		
9	340		
10	460		

Assume **400 kWh** is the **energy generated** every month for every customer, and each customer's **rental fee** is **\$25** per month. Electricity is sold back to the electricity company at **5 cents per kWh**. You do not lose money if the customer consumes too much energy – you simply don't sell any energy back to the electricity company on that month.

**\* Enter the data in the table into a vector. Use loops and conditional statements to do following (do not calculate manually):**

**a)** What is the company's total monthly revenue?

The company spends an initial cost of 150,000 dollars to purchase the solar panels.

**b)** Using the revenue from part **a**, find how long (how many months) until the company breaks even? (hint: use *while* loop)

Break even is the point at which the initial cost (money spent by business owner to get the panels) is recovered through profits.