ECE 257 - LESSON 17
FOR AND WHILE LOOPS - PART II

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IN CLASS

BREAK AND CONTINUE STATEMENTS

1. A for loop with a break statement

```
for k = 1: 5
    if k == 3
        break
    end
    disp(['k=', num2str(k)])
end
```

   a. What does the break statement do

2. A for loop with a continue statement

```
for k = 1: 5
    if k == 3
        continue
    end
    disp(['k=', num2str(k)])
end
```

   a. How is the continue statement different from the break statement

BASIC WHILE LOOPS

3. A simple while loop

```
n = 1;
x = input ('Enter first data point: ');
sum_x = x;
while sum_x < 100
    x = input ('Enter next data point: ');
    sum_x = sum_x + x;
    n = n + 1;
end
disp (['It took n = ', num2str(n), 'data points for sum_x to reach 100']);
```

   a. Describe what this while loop is doing
   b. How are while loops different from for loops

4. Write a program to determine the smallest value of N for which

$$\sum_{n=1}^{N} \frac{1}{n} > s$$

for given value of s. Test your program for $s = 1$, $s = 2$, $s = 5$ by showing that

$$\sum_{n=1}^{N-1} \frac{1}{n} < s \quad \text{and} \quad \sum_{n=1}^{N} \frac{1}{n} > s$$

As usual make use of a Table

LOGICAL ARRAYS AND VECTORIZATION

5. A program using a logical array

```
a = [2  7  4;  5  2  8]
b = a > 5
a(b) = 5
```

   a. Describe the vector b
   b. What does $a(b) = 5$ do
   c. How are logical arrays like the find function

6. A variation on Exercise 5

```
a = [2  7  4;  5  2  8]
b = a >= 5
a(b) = 5
a(~b) = -5
```

   a. Describe what's going on in this program

7. Write a program using a logical array to plot $x(t) = |5\cos(2\pi 100t)|$