

Remember to indent the bodies of your IF-THEN statements and looping structures.

- 1) (2 pts) The program below is supposed to perform the same task as the one in the notes. Explain why this program is not correct.

```
total = 0;
flag = 0;
while (flag == 0)
    t = input('Input next value ');
    if(t < 0)
        flag = 1;
    end
    total = total + t;
end

ts = ['Total of values entered = ' num2str(total)];
disp(ts)
```

- 2) (4 pts) Modify the (correct) program from the notes that reads and totals the series of user input numbers to also compute the average of the input values. You will need to add another accumulation variable that counts the number of values that are input. Test your program using the numbers

4, 7, 8, 2, 3, 9, 13, 6, 12.

- 3) (4 pts) Write a program that will ask the user to input an integer $n \geq 0$ and computes $n!$. Recall that $n!$ is defined as

$$n! = n \cdot (n - 1) \cdot (n - 2) \cdots 2 \cdot 1.$$

and that by definition, $0! = 1$.

This is another type of accumulation operation, but here you are accumulating a product instead of a sum, so you need to initialize your accumulation variable differently. The key is to find a way to relate the formula for $n!$ to a loop index variable. Test your program using the values $n = 0, 3, 7$.

- 4) (2 pts) The code below is nearly the same as the one in the notes, but one small change was made. What effect on the vector y does this change have?

```
x = linspace(-1,1,21)';
y = zeros(size(x));
for i = 1:length(x)
    if(x(i) < 0)
        y(i) = x(i)^3 - x(i) + 5;
    else
        y = x(i)^2;
    end
end
```

- 5) (2 pts) Generate any 4×4 matrix A you wish, then type

```
>> sum(A)
```

How does the `sum` function behave when the input is a matrix? How would you sum all the elements of a matrix?