PSYCO 403/505 - Matlab for Vision Research

EXAM 1 (opened book-n-computer)

NAME: _____ CCID: _____

Question 1: CONCAT.m
A. Read the program below.

```
% CONCAT.m
% written by Kyle Mathewson
% last updated 10/08/2016
% file names must use padded numbers for values smaller than 10.

fprintf('Remember to start program within data directory   \n');
namestr = input('What is the file label (all but subject number)? ','s');
ext = input('What is the file extension? ','s');
k = input('Are subject numbers added to the beginning (= 1) or end (= 2) of
file label? ');
startss = input('What is the first subject number? ');
endss = input('What is the last subject number? ');
extrainfo = input ('Remove all extraneous lines which do not start with the
subject number\n(will leave first row of column labels intact) (y/n)? ','s');

for i=startss:endss
     numi=int2str(i);

     if (k == 1)

          if (i < 10)

               fn = ['0',numi,namestr,'.',ext]
          else

               fn = [numi,namestr,'.',ext]
          end

          filename = ['all',namestr,'.txt'];


    elseif (k == 2)

          if (i < 10)

               fn = [namestr, '0', numi,'.',ext]
          else
```

```
                fn = [namestr, numi,'.',ext]
          end

          filename = [namestr,'all.txt'];

    end   % question: which statement is this end referring to?

    fida=fopen(filename,'a');

    fidr=fopen(fn,'r');

    if (fidr ~= -1)

          if(i==1)

                FIRSTLINE = fgetl(fidr);
                fprintf(fida,'%s\n',FIRSTLINE);
          end

          while (~feof(fidr))

                TLINE = fgetl(fidr);

                if (~strcmp(TLINE,''))

                      if (strcmp(extrainfo,'y'))

%  note2self: 'yes' means take out.
                            if (~strcmp(TLINE(1),numi(1)))

                                  continue; %what is this command?
                            end

                      end

                      fprintf(fida,'%s\n', TLINE);
                end
          end

          fclose(fidr);
     end
end   %which loop is this end referring to?

fclose(fida);
clear all
```

A.1 Annotate the code above explaining what each of the flow control statements are trying to do/determine. 2 points
A.2 Please describe below what the program CONCAT.m does (complete sentences please). 4 points

B. Imagine that you run this program inside a folder that contains the following files:

01-expt1.dat	experiment1.m	notes2self.txt
02-expt1.dat	inst.m	todolist.txt
03-expt1.dat	instructions.txt	readme.txt
04-expt1.dat	start.m	pilot01.m
08-expt1.dat	designexpt2.doc	pilot02.m
12-expt1.dat	designexpt1.doc	99-expt1.dat

B.1 What will be the output of the program if the user's input to the questions are:

```
namestr = '-expt1'
ext = 'dat'
k = 1
startss = 1
endss = 99
extrainfo = y
```

Be specific in your response: What's the name of the file created by this program?
Describe the contents of this new file. How many files are read? How many are created? 2 points

B.2 What would be the output of the program if the user's input to the questions are:

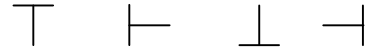
```
namestr = 'designexpt'
ext = 'doc'
k = 2
startss = 1
endss = 2
extrainfo = n
```

Explain why the new file is empty? How can the user modify the program to take care of this problem? 1 point

B.3 What would be the output of the program if the user's input to the questions are: 1 point

```
namestr = 'pilot'
ext = 'm'
k = 2
startss = 1
endss = 2
extrainfo = n
```

C. Option 1: (10 points) Write a program that creates four jpg image files, each displaying the letter: 

as a white letter on a black background, each in one of four possible orientations. 

Additional constraints:

1. Each time the program is run, the user specifies the height (how tall the T is), in pixels, as well as the pixel-width of the T(i.e., the "pen width" or how wide the lines composing the T are in pixels).
2. The resulting T must be as wide as it is tall (length of horizontal bar = length of vertical bar).
3. The black background should be a square approximately 25% larger than the height of the letter T.

Submit images and code.

Option 2: (5 points each)

a. Write a program that increases the contrast in the Durer image by a percentage specified by the user. That is, gray values closer to white are INCREASED by the user-specified percentage and gray values closer to black are DECREASED by the user-specified percentage.
b. Write a program that displaces each row in the image horizontally by one pixel to the right (incrementally). For example, if the first row occupies pixels 1 through 100, the "new" second row should occupy pixels 2 through 101; the third row should occupy pixels 3 through 102, and so on. All empty pixels in the new image should be black.

Save both images in jpg format. Submit images and code.