CISC 106 Midterm 2 Review Spring 08

These questions are designed to help you think about course material, not to show you actual exam questions. A significant part of the exam will be multiple choice. The remainder will be short answer or coding. Research shows that the best way to study for an exam is with other people. So, group study is highly recommended. Try to teach your group members a particular topic. When studying, always take the time to explain why an answer is correct. This will help you solidify your knowledge.

1. Given a description of any function from the basic project (not the enhanced version), show how to create test parameters and use them in a call to the function.

2. Given a description of any function from the basic project (not the enhanced version) and sample input, show how to call the function and show its output (if any).

3. Show how to make a "board" with about half the squares containing goldfish.

4. Convert a simple function or expression to its vectorized form.

5. Show how to make a constant, like BLANK or GOLDFISH, in Matlab. What is the point of having named constants instead of numbers? Give two reasons.

6. Given a vector m = [1 4 6 7 3 9], give a Matlab expression that will evaluate to m with 7 removed.

7. Write a function that will remove a number from a vector. The number and vector are parameters.

8. Write a recursive and an iterative function to display a triangle of asterisks.

9. Write a recursive function to calculate a simple numeric function, like factorial or exponent.

10. Demonstrate the use of the Matlab "patch" function.

11. Given a call to patch, show what it would produce on an existing figure.

12. Create, and access the fields of, structures as shown in class.

13. Given some data in matrices, show how to plot it using the plot function.

14. Show how to store strings of different lengths in a Matlab array.

15. Pass in two vectors of the same length to a function, and create a 2d array whose first row is the contents of the first vector and its second row is the contents of the second vector.

16. Show how to use the Matlab functions length() and size() to help write for loops for a matrix of any size. When do we use length, and when do we use size?

17. Show how to extract the vector [2 3] from the vector [1 2 3 4 5]

18. Show how to extract the matrix [2 3; 6 7] from the matrix [1 2 3 4; 5 6 7 8]

19. Show how to extract the matrix **[2 3; 6 7]** from the matrix **[2 2 2 2; 1 2 3 4; 5 6 7 8; 9 9 9]**

20. Demonstrate the use of the keyword "end" inside a matrix reference.

21. What are the differences between a script and a function? Both are stored in M-files. Why have both?

- (a) Which can change command line variables?
- (b) Which has local variables whose use doesn't affect other Matlab variables?
- (c) Which must be passed parameters if its use depends on external values?
- (d) Which can be evaluated as an expression to yield a value?

22. There are important differences between values that are printed and output values. Consider the following function definitions, and assume they are in three different M-files:

```
function [] = f(x)
disp(x);
end
function result = g(x)
result = 2^*x;
end
function output = h(x)
result = 3^*x;
end
```

Which of the following function calls will run correctly?

```
(a) >> f(1)

(b) >> g(1)

(c) >> h(1)

(d) >> x = f(1)

(e) >> x = g(1)

(f) >> x = h(1)

(g) >> fprintf(`\%f`, f(1))

(h) >> fprintf(`\%f`, h(1))

(i) >> disp(g(1))

(j) >> disp(h(1))
```

23. Suppose hard drive has 32,000,000,000 bytes. About how many student records can the drive store if each record takes 250 bytes?

24. Assume that you have two directories inside your home directory, lab01 and lab02. If lab02 is your current directory at the start of each of the following questions, show how to use a single Unix shell command to:

- (a) make home your current directory
- (b) make lab01 your current directory
- (c) copy file spam.txt from lab01 to lab02
- (d) move file spam.txt from lab02 to lab01
- (e) change the name of spam.txt in lab02 to vegemite.txt
- (f) list the files in lab02

(g) delete the file marmite.txt from lab02

(h) display the name of the current directory

(i) show all .m files in the current directory

(j) change in to your home directory and create a directory for lab03 (you may use two commands for this one).

25. Find the bug in a program. Get a study mate to put a bug in three M-files, and you do the same for them, then swap papers.

26. Given a test script, write the function that it is supposed to test.

27. Given a function, write a test script for it (on the exam, you would be expected to identify boundary cases without a reminder).

28. Given a function, show how to use it from the command line.

29. Write the format specifier that goes in the blank below:

fprintf('The answer is: ____', 12.123);

so that it will print the following exactly (there are seven spaces):

The answer is: 12.123

30. Given a function that has a missing line or section of code, fill in the missing code.

31. Evaluate relational and logical expressions as Matlab does:

(a) 4 < 5 & 6 > 7(b) (5! = 5) | 1(c) !(1 & 1 | 0)(d) 4 & 3 < 2

32. Write an if statement that prints "boo" if a number is between 12 and 17, inclusive.

33. Write code that prints "blue" for numbers less than 5, "green" for numbers from 5 to 10 inclusive, and "mauve" for numbers higher than 10.

34. Write a recursive function to match a recursive definition (See Lab 4.1).

35. Given a recursive function with an error, fix it.

36. Write a for loop to display the even numbers from 0 to 10.

37. Write a for loop to count the number of sevens in a matrix x.

38. Write a for loop to change each seven in a matrix x to an 8.

39. Write a for loop to sum the elements in a matrix x.

40. Write a for loop to get user input to fill the elements in a matrix x.

41. Make a 2x3 matrix of zeros without typing any zeros.

42. Make an array of ones the same dimensions as the matrix x.