

PEER ASSISTED STUDY SESSIONS

Facil: Charles Bergeron Course: SYSC 2006 AB Date: Mon. Sep. 23 Thu. Sep. 26, 2013
Office Hour: Thursday am TB 302 Email Address: charles_bergeron@carleton.ca

PASS MOCK EXAM – FOR PRACTICE ONLY

Course: SYSC 2006 Facilitator: Charles Bergeron
Dates and locations of mock exam take-up: Dec 9, ME 3275, 6:00

IMPORTANT:

It is **most beneficial** to you to write this mock final **UNDER EXAM CONDITIONS**. This means:

- Complete the final in 3 hour(s).
- Work on your own.
- Keep your notes and textbook closed.
- Attempt every question.

After the time limit, go back over your work with a different colour or on a separate piece of paper and try to do the questions you are unsure of. Record your ideas in the margins to remind yourself of what you were thinking when you take it up at PASS.

The purpose of this mock exam is to give you practice answering questions in a timed setting and to help you to gauge which aspects of the course content you know well and which are in need of further development and review. Use this mock exam as a *learning tool* in preparing for the actual exam.

Please note:

- Come to the PASS session with your mock exam complete. There, you can work with other students to review your work.
- Often, there is not enough time to review the entire exam in the PASS session. Decide which questions you most want to review – the facilitator may ask students to vote on which questions they want to discuss.
- Facilitators do not bring copies of the mock exam to the session. Please print out and complete the exam before you attend.
- Facilitators do not produce or distribute an answer key for mock exams. Facilitators help students to work together to compare and assess the answers they have. If you are not able to attend the PASS session, you can work alone or with others in the class.

GOOD LUCK!

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#0 C language understanding quiz!

- What is a memory leak? Why is this potentially dangerous?
- If I print an integer as a character, what would happen, if anything?
- What are the differences between an array of characters and a string, if any?
- What are the differences between a float and a double, if any?
- What does malloc do exactly? Why sizeof()?
- How do linked lists differ from arrays? When would I use one and not the other? How do they differ from a memory allocation stand point?
- Can we check two floats for equivalence? Should we?
- With what data structures can we simulate a stack? What are some unique properties of a stack?
- What are the restrictions of a queue data type?
- What is recursion?

#1 Write a function that takes in an array of integers, and sorts the array from smallest number to largest.

#2 Draw the stack frame diagram at the given points for the code below. (It would be good practice to draw the diagram for every question in this mock!!!)

<pre>int main(void) { int x = 3; int* p; p = &x; p = foo(x,p); //////////////////////////////////// *p = 5; p = rawr(x, *p); ////////////////////////////////////</pre>	<pre>int* foo(int a, int* b) { *b = (*b)*a; char* x = malloc(a*sizeof(char)); //////////////////////////////////// x[2] = 1; x[1] = 'k'; //////////////////////////////////// return (malloc(sizeof(int)) char* rawr(int a, int b) { a = pow(a,b); b = b-3; char* s = malloc(sizeof(char)*4); s[0] = 'H'; s++; s[0] = 'I'; return s;</pre>
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#3 (Ignore this question if recursion has not been covered in class) Write a recursive function that calculates the factorial of a number (i.e. 5! = 5x4x3x2x1). It is up to you as to how to structure the function, as long as it is recursive.

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#4 Write the source code for a function that initializes a linked list of length num. This linked list should be of type student, given below. Also, each student id should be initialized in order, starting from 1. (First student is 1, second student is 2, so on).

```
typedef struct student {  
  
    int id;  
    float grade;  
    student* next;  
  
}STUDENT;  
  
_____ class_create(int num); (What is the return type?)
```

#5 Write the source code for a function that takes in a linked list, consisting of “student” structs. This function should then remove any students with a grade field below 50.0 .

```
Void student_remove( student* class);
```

#6 Say a struct “customer” represents a customer waiting in line at a store. Write a function that adds customers to the line, and also asks and initializes the customer’s order (as a number). The order is an integer stored within the customer struct as an integer. It is recommended to try solving this question for both the array and linked-list based implementation of a queue.

```
typedef struct customer {  
  
    int order;  
    float cost;  
  
} CUSTOMER;
```

```
Void customer_add(Q* line);
```

#7 Write the source code of a function that will go through a line of customers, totalling up their total cost. Assume the cost is a float stored within the customer struct. Don’t forget to apply tax (13%). Assume that you start from the front of a queue, and work your way towards the end.

```
float line_cost(Q* line);
```

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