CS215 Winter 2007 – Final (D. Hepting)
April 20, 2007
CL232 – 09:00-12:00

PLEASE READ: There are 120 marks available (and 180 minutes in which to complete the exam). The exam is closed book. You have been given 3 exam booklets: 2 to hand in and the other (optionally) for rough work (please return it if it is unused). On the booklets with your answers, fill in the fronts completely (except where noted). Between the 2 booklets, there are 22 page sides. In the top left corner of each page side, number the page sides IN SEQUENCE, 1-22. Answer 1 and ONLY 1 question per page side. Put your answer for question *n* on page side *n* (as you've numbered them). You DO NOT have to fill the page side with your answers! Quality is more important than quantity. The only place where you should write on the exam is after Question 22. Please indicate (YES or NO) if you would like to have your code included in the version of the web-based participant pool management system that goes into use at the University of Regina and becomes available as open source. If you don't indicate a preference, your code ***will*** be included. When you have completed the exam, return this sheet tucked inside your exam booklet. If you follow all of these instructions, you will earn 4 marks (no part-marks awarded on these). Questions about exam questions will not be answered during the exam – note your assumptions in your answers.

Part 1 of 3 (Choose 16 of 18 questions x 5 marks).

1. What is a better alternative to big-bang integration?

2. How should test cases for a routine be devised?

3. Why should you be concerned about the layout of your code? Explain.

4. Discuss when it is appropriate to use more than 1 return in a routine.

5. What is the pseudocode programming process, with loop creation as an example?

6. What are some techniques you can use to improve the quality of software that you write?

7. What are 2 things to remember about pointers? Where should pointers point after they are finished pointing?

8. What is the span of a variable and why is it important?

9. What should you do before "seeing if it compiles"? Why? What's a word that McConnell used to describe this attitude (starts with an 's')?

10. What is the similarity between scenarios and test cases (written before coding)?

11. What is defensive programming and what are some techniques to put it in practice?

12. Relate routine-naming to the concept of abstraction. What makes a good routine name?

13. How can you maintain the conceptual integrity of a project?

14. What role do users play in the construction of quality software?

15. How do you achieve readability in your code?

16. When don't comments add value to code, and when (and how) do they add value?

17. How can "lazy" be good? What is good to keep in mind when programming?

18. What is the value measuring various aspects of your own software construction? Give examples.

Part 2 of 3 (2 questions x 10 marks).

19. Discuss your experience on the course project in terms of the course material. If you had it to do all over again, would you do anything differently?

20. Discuss, with some specifics, how complexity, coupling, and cohesion are related.

Part 3 of 3 (2 questions x 10 marks).

21. Identify 10 things to fix in this code, then ***briefly*** why you chose them and how to fix them.

```
void HandleStuff(CORP_DATA & inputRec, int crntQtr, EMP_DATA empRec,
    double &estimRevenue, double ytdRevenue, int screenX, int screenY,
    COLOR_TYPE &newColor, COLOR_TYPE &prevColor, StatusType &status,
    int expenseType)
{
int i;
for (i = 0; i < 100; i++ ) {
    inputRec.revenue[i] = 0;
    inputRec.expense[i] = corpExpense[ crntQtr ][i];
    }
UpdateCorpDatabase( empRec );
estimRevenue = ytdRevenue * 4.0 / (double) crntQtr;
newColor = prevColor;
status = SUCCESS;
if (expenseType == 1) {
    for (i = 0; i < 12; i++ )
        profit[i] = revenue[i] - expense.type1[i];
    }
else if (expenseType == 2) {
        profit[i] = revenue[i] - expense.type2[i];
        }
```

```
else if (expenseType == 3) {
        profit[i] = revenue[i] - expense.type3[i];
        }
```

22. In the following, what are the problems and how can the code be improved? (2 parts x 5 marks).

a)

```
switch(InputVar) {
      case 'A': if (test) {
                        // statement 1
                        // statement 2
      case 'B':         // statement 3
                        // statement 4
                        …
                        }
                …
                break;
      …
}
```

b)

```
int result = RetrievePayrollData(data, true, false, false, true);
```

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I, _____ (print name), understand that the class project for cs215 may go on to be used at the University of Regina, and elsewhere (under an open source software license).

YES, I AGREE to allow my code to be included _____ (signature)

NO, I DO NOT AGREE to allow my code to be included _____ (signature)

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That's it. Have a great summer.