

OHJ-1106 Programming I: Exam 26.03.2007

Write your answers on a separate paper. Write clearly! The lecturer is not an expert in hieroglyphics. Put your name and student number on each answer sheet. Copy the grid below to the top of the first answer sheet.

1	2	3	4	5	=

Make sure you read the questions carefully before answering them. Cell phones and calculators are *NOT* allowed in the exam. The maximum amount of points is 30. Good luck!

Problem 1

Explain shortly the following concepts. An example alone isn't enough.

1. pseudocode (1p.)
2. the scope of a variable (1p.)
3. associativity (1p.)
4. short-circuit evaluation (1p.)
5. const (1p.)
6. compiler(1p.)

(6p.)

Problem 2

1. Why is comparing real numbers (variables of the type double) dangerous with the == and the != operators? How should the situation be handled? (3p.)
2. You are testing a program. During a long test run, the program ends execution in segmentation fault(core dumped)
How can you find the place in the code that produces the error? (3p.)

(6p.)

CONTINUES!

Problem 3

1. Bill managed to scramble the text in a file called "my_thesis.txt". The file contents was changed into this:

```
w*nter the dur*ng TUT at wr*tten been has the*s Master's Th*s  
...man*plulat*on.str*ng on *s the*s the of emphas*s The 2006.
```

i.e. the word order has been reversed and the character 'i' has been replaced with the * character.

Help Bill to sort his thesis out as the next department council's meeting is less than a month away. Implement functions that correct the word order and replace the * with the original 'i'. Implement also a main that reads the text from the file and writes the corrected text into "corrected.txt".

You can use the following string's **own** functions in your solution:

```
string& append(const string& s);  
string& erase(size_type pos, size_type n );  
string& replace(size_type pos, size_type n, const string& s);  
size_type find(const string& s);  
string substr(size_type pos, size_type n);  
string& insert(size_type pos, const string& s);  
operators =, ==, +, <, >
```

(6p.)

Problem 4

Add the required error checking into the following code segments:

1.

```
int div = 0;  
int num = 0;  
cin >> div >> num;
```
2.

```
cout << num/div << endl;
```
3.

```
int val = array[ num ];
```

(3p.)

CONTINUES

Problem 5

1. When running the style program to your code with
`/home/kurssit/style/style -w -v1 -f1 -s -cp1file code.cc`
you get the following feedback:

Warnings:

File: bad_style.cc

ACLP: No comments found in file.

CABP: No beginning comment.

AONC, line 10: Numeric constant bigger than 10.

LWMS, line 10: Multiple statements on line.

AONC, line 12: Numeric constant bigger than 10.

BWBP, line 14: A braceless block found.

AONC, line 18: Numeric constant bigger than 10.

BLIP, line 20: Badly indented line in block.

INSP, line 21: Badly placed braces.

...

What can you say about the code based on this. What needs to be improved in the code? (3p.)

2. The programmer doesn't always need to implement everything from scratch but library implementations can be used instead. Give two examples of the libraries of C++ and describe what they can be used for. Use examples. (3p.)

(6p.)

Problem 6

The Finnish Ice Hockey league's playoffs are starting. Describe the data structures and types you would use to store the players in a team. Each team can have 20 players per game. The following information is stored for each player: name, number, position and number of goals. The position can be goaltender, defense or forward.

(3p.)

THE END!