

The American University in Cairo
Department of Computer Science & Engineering
CSCI 106-03&04&09

Dr. KHALIL	Quiz-III	Fall 2012
Last Name :		ID:
First Name:		Form – I Section No. ()

EXAMINATION INSTRUCTIONS

- * Do not turn this page until asked to do so.
- * Exam time is **50** minutes.
- * Put the answers on the same question sheet, do not use any additional papers, even for scratch.
- * Write your name, ID, section no. in the indicated places.
- * Read the exam instructions.
- * Read the honesty policy.
- * Sign the following statement.

Academic Integrity Policy

Cheating in Exams is a violation of the Academic Integrity policy of AUC. Whispering, talking, looking at someone else's paper, or copying from any source is considered cheating. Any one who does any of these actions or her/his answers indicates that she/he did any of them, will receive a punishment ranging from zero in this exam to failing the course. If repeated, it may lead to dismissal from AUC.

I have read the honesty policy and exam instructions and I am presenting this exam as entirely my effort.

Signature: _____

DO NOT USE THIS SECTION

Question	Points	Grade
1	30	
2	20	
3	25	
4	25	
Total	100	

Question 1 (30 points)

Show the output of each of the following program segments:

<pre>int x = 1, y = 1; while (x < 3) { y = y * x++; cout << "x = " << setw(2) << x << "y = " << setw(2) << y << endl; }</pre>	
<pre>const int two = 2; int n = 9; do { cout << n % two; n /= two; } while (n != 0); cout << endl << "Done!!" << endl;</pre>	
<pre>x = 5; y = 30; while (x > y) x *= 2; cout << setw(3) << x << setw(3) << y << endl;</pre>	
<pre>int a = .., b = .., c = ..; // a, b, and c are assigned some values if ((a > b) && (a <= b)) cout << "It is the first case!!" << endl; else if ((b == c) (b != c)) cout << "It is the second case!!" << endl; else cout << "It is the third case!!" << endl;</pre>	
<pre>float a = 2, b = 2, c = 1.5; int d = 4, e = 5.5, y; y = a * (b - c) + e / d; cout << " y = " << setw(4) << y << endl; a = 3.3456; b = 5.9876; cout << setprecision(1) << setw(6) << a << setw(6) << b << endl; cout << setprecision(0) << setw(6) << a << setw(6) << b << endl;</pre>	
<pre>string nm; for (int n = 0; n < 4; n++) { switch(n % three) { case 1: nm = "One!!"; break; case 2: nm = "Two!!"; break; default: nm = "Zero!!"; } cout << nm << endl; } cout << "It is Done!!" << endl;</pre>	

Question 2 (20 points)

- a) Write a C++ loop to compute and print out the sum and count of all the positive integers that are divisible by 6 and the sum and count of all the positive integers that are not divisible by 9 in the range 1 to 200 (inclusive).

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- b) Write a C++ loop to generate the following sequence:

1 2 4 8 16 32 64

[illegible]

- c) Write a C++ loop to generate the following sequence:

2 3 5 9 17 33 65

Question 3 (25 points)

A country charges its citizens an income tax each year. The tax rate is based on the Income of the year according to the following table:

Income (\$)	Tax Rate
Income < 10000	5.5%
10000 <= Income < 20000	10.4%
20000 <= Income < 40000	15.6%
Income >= 40000	23.7%

Draw a flow chart and write a program in C++ that reads a person's income, prints the tax owed **rounded to the nearest dollar. Show the three phases of software development: the analysis, design, and implementation. Implement your solution in C++ using nested-if structure, and second using the switch structure. Enforce validation on the input Income such that it is not less than 0 and not greater than 100000.**

The Analysis

[illegible]

The Flow Chart

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[illegible][illegible]

Write a C++ program to enter scores of **n** students in a test, compute and print out the average score (**avgScore**), the highest score (**highScore**), the number of scores that are below **50** (**countB50**), and the number of scores that are above **90** (**countA90**). Your program should validate the user input to only accept for **n** a positive integer value greater than **0** and not more than **40**, and for each score an integer value between **0** and **100** (inclusive).

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