CSE105 Introduction to Programming in Java, 2016
Assignment 1, prepared by Chris Trathen

Instruction
(1) There are 5 questions for the first assignment. Each question is worth 20 marks. The assignment is worth 15% of the total mark for CSE105.
(2) Plagiarism will be very closely monitored. You should be very cautious when you discuss with classmates. Two similar answers will all get zeros marks or more serious consequences. After the marking, some of the students will be interviewed to confirm their independence in the completion of the assignments.
(3) The deadline for submission of Assignment 1 is: **6:00pm, October 16, 2016 Sunday**. You should pack all of your code with WinRAR, using your student ID as the file name and then upload it to ICE. The uploading link will be automatically stopped after 6:00pm.

Question 1

The factorial function of a positive integer n is the product of all the integers from 1 to n. For example, the factorial of 5 is 1x2x3x4x5 = 120. This is usually expressed as 5!=120. By definition 0!=1. Write a program that calculates the factorial n!.

Write a program that accepts as input a number between 0 and 20 and calculates the factorial of that number.

Question 2

Write a program that prints a table of temperature conversion from Celsius to Fahrenheit. For example:

Celsius	Fahrenheit
100	212
5	41
……	
-5	23

The exact range of data used is your choice. This is example only.

Use the formula F = C * 9 / 5 + 32

Perform the calculation using floating point arithmetic, but display the results as the closest integer.

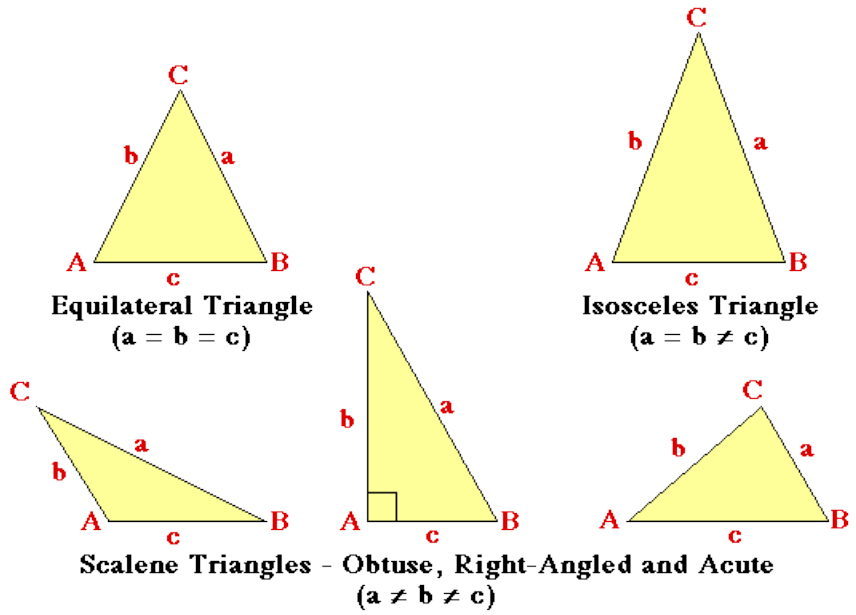
Question 3

Write a program that analyses a triangle. Input the length of 3 sides of a triangle from the keyboard.

Firstly, reject any input that does not represent a triangle.

Then determine whether the triangle is:

- Equilateral - all sides the same length
- Isosceles - two sides the same length
- Scalene - no sides the same length



Question 4

A leap year is a year with 366 days. A leap year has the 29th February. A year is a leap year if it is divisible by 4 except for the century years (divisible by 100). Century years are only leap years if they are divisible by 400. Write a program that accepts a year and determines if it is a leap year.

Use a separate method to test if a year is a leap year.

The following information will help when you test your program. The leap years 1800 to 2400:

1804	1904	2004	2104	2204	2304
1808	1908	2008	2108	2208	2308
1812	1912	2012	2112	2212	2312
1816	1916	2016	2116	2216	2316
1820	1920	2020	2120	2220	2320
1824	1924	2024	2124	2224	2324
1828	1928	2028	2128	2228	2328
1832	1932	2032	2132	2232	2332
1836	1936	2036	2136	2236	2336
1840	1940	2040	2140	2240	2340
1844	1944	2044	2144	2244	2344
1848	1948	2048	2148	2248	2348
1852	1952	2052	2152	2252	2352
1856	1956	2056	2156	2256	2356
1860	1960	2060	2160	2260	2360
1864	1964	2064	2164	2264	2364
1868	1968	2068	2168	2268	2368
1872	1972	2072	2172	2272	2372
1876	1976	2076	2176	2276	2376
1880	1980	2080	2180	2280	2380
1884	1984	2084	2184	2284	2384
1888	1988	2088	2188	2288	2388
1892	1992	2092	2192	2292	2392
1896	1996	2096	2196	2296	2396
	2000				2400

Question 5

Write Java program to check if a number is Armstrong number.

An Armstrong number of 3 digit is a number for which sum of cube of its digits are equal to the number.

Examples:

371 is an Armstrong number because 3*3*3 + 7*7*7 + 1*1*1 = 371.

123 is not an Armstrong number because 1*1*1 + 2*2*2 + 3*3*3 = 36.

This assignment is individual work. Plagiarism (e.g. copying materials from other sources without proper acknowledgement) is a serious academic offence. Plagiarism will not be tolerated and will be dealt with in accordance with the University Code of Practice on Assessment.