

Extra programming exercises for ACS course

Exercises are taken from <http://www.cplusplus.com/forum/articles/12974/> and modified to adapt them to VBA course. They are a mixture of very easy, difficult and very long exercises.

WARNING: these exercises include functions and techniques which have **not** been presented in class (and thus will not be asked at the exam). They are here only to give you the possibility to think and do further exercises.

Grading Program

Write a program that allows the user to enter the grade scored in a programming class (0-100). If the user scored a 100 then notify the user that they got a perfect score.

★ Modify the program so that if the user scored a 90-100 it informs the user that they scored an A

★★ Modify the program so that it will notify the user of their letter grade
0-59 F 60-69 D 70-79 C 80-89 B 90-100 A

Cola Machine

Write a program that presents the user w/ a choice of your 5 favorite beverages (Coke, Water, Sprite, ... , Whatever).

Then allow the user to choose a beverage by entering a number 1-5.
Output which beverage they chose.

★ If your program uses if statements instead of a select case statement, modify it to use a select case statement. If instead your program uses a select case statement, modify it to use if/else-if statements.

★★ Modify the program so that if the user enters a choice other than 1-5 then it will output "Error. choice was not valid, here is your money back."

While(user == gullible)

Requires:

Write a program that continues to ask the user to enter any number other than 5 until the user enters the number 5.

Then tell the user "Hey! you weren't supposed to enter 5!" and exit the program.

★ Modify the program so that after 10 iterations if the user still hasn't entered 5 will tell the user "Wow, you're more patient than I am, you win." and exit.

★★ Modify the program so that it asks the user to enter any number other than the number equal to the number of times they've been asked to enter a number. (i.e. on the first iteration "Please enter any number other than 0" and on the second iteration "Please enter any number other than 1" etc. etc. The program must behave accordingly exiting when the user enters the number they were asked not to.)

Pancake Glutton

Write a program that asks the user to enter the number of pancakes eaten for breakfast by 10 different people (Person 1, Person 2, ..., Person 10)

Once the data has been entered the program must analyze the data and output which person ate the most pancakes for breakfast.

★★ Modify the program so that it also outputs which person ate the least number of pancakes for breakfast.

★★★★ Modify the program so that it outputs a list in order of number of pancakes eaten of all 10 people.

i.e.

Person 4: ate 10 pancakes

Person 3: ate 7 pancakes

Person 8: ate 4 pancakes

...

Person 5: ate 0 pancakes

Bracketing Search

Write a program that calculates a random number 1 through 100. The program then asks the user to guess the number.

If the user guesses too high or too low then the program should output "too high" or "too low" accordingly.

The program must let the user continue to guess until the user correctly guesses the number.

★ Modify the program to output how many guesses it took the user to correctly guess the right number.

★★★★ Modify the program so that instead of the user guessing a number the computer came up with, the computer guesses the number that the user has secretly decided. The user must tell the computer whether it guessed too high or too low.

★★★★★ Modify the program so that no matter what number the user thinks of (1-100) the computer can guess it in 7 or less guesses, using a smart technique to choose each new number.

Tic Tac Toe

Make a two player tic tac toe game, asking the players their moves and depicting the X or the O on the A1:C3 range.

★★★★★ Modify the program so that it will announce when a player has won the game (and which player won, X or O)

★★★★ ★★ Modify the program so that it is a one player game against the computer (with the computer making its moves randomly)

★★★★★★★ Modify the program so that anytime the player is about to win (aka, they have 2 of 3 X's in a row, the computer will block with an O)

Fun with Subs

Write a sub titled say_hello() that outputs to the screen "Hello"

★ Modify the sub so that it takes an integer argument and says hello a number of times equal to the value passed to it.

★★ Make a function that takes two integers arguments and then returns an integer that is the product of the two integers.

(i.e., integer1: 4, Integer2: 5 returns: 20)

★★★ Make a sub called half() that takes an integer argument. The sub must print the number it received to the screen, then the program should divide that number by two to make a new number. If the new number is greater than zero the sub then calls the sub again half() passing it the new number as its argument. If the number is zero or less than the sub exits

Call the sub half() with an argument of 100, the screen output should be
100
50
25
...
...
1.

Strings are your friends, until they betray you.

Write a program that asks for a user first name and last name separately.
The program must then store the users full name inside a single string and out put it to the string.
i.e.

Input:

John

Smith

Output:

John Smith

★ Modify the program so that it then replaces every a, e, i, o, u w/ the letter z.

i.e.

John Smith -> Jzhn Smzth

★★★ Modify the Program so that it reverses the users name

i.e.

John Smith -> htimS nhoJ

★★★★★ Modify the Program so that it asks also the date of birth and the sex and displays the first part of the Italian tax code according to following official rules.

Cognome (3 lettere): Vengono prese le consonanti del cognome nel loro ordine: solo se sono insufficienti, si prelevano anche le vocali, sempre nel loro ordine e, comunque, le vocali vengono riportate *dopo* le consonanti.

Nome (3 lettere): Vengono prese le consonanti del nome nel loro ordine in questo modo: se il nome contiene quattro o più consonanti, si scelgono la prima, la terza e la quarta, altrimenti le prime tre in ordine. Solo se il nome non ha consonanti a sufficienza, si prendono anche le vocali: in ogni caso le vocali vengono riportate *dopo* le consonanti.

Anno di nascita (2 cifre): si prendono le ultime due cifre dell'anno di nascita;

Mese di nascita (1 lettera): ad ogni mese dell'anno viene associata una lettera in base a questa tabella:

Lettera	Mese	Lettera	Mese	Lettera	Mese	Lettera	Mese	Lettera	Mese	Lettera	Mese
A	gennaio	E	maggio	P	settembre	C	marzo	L	luglio	S	novembre
B	febbraio	H	giugno	R	ottobre	D	aprile	M	agosto	T	dicembre

Giorno di nascita e sesso (2 cifre): si prendono le due cifre del giorno di nascita (se è compreso tra 1 e 9 si pone uno zero come prima cifra); per i soggetti di sesso femminile a tale cifra va sommato il numero 40.