

CS 210 - Fundamentals of Programming I

Spring 2006 - In-class exercise for 2/21/06

10 points

Names: _____

This exercise should be completed in pairs. The purpose of this exercise is to work with the case selection construct. Here is a problem statement, analysis, and design for today's in-class exercise.

Problem Statement

Write a simulator for a simple calculator. It should repeatedly perform a computation until the user wants to quit.

Main Program

- Analysis

Objects	Type	Kind	Name
Operation choice	char	varying	choice
User continuation answer	char	varying	answer
First operand	double	varying	operand1
Second operand	double	varying	operand2
Result	double	varying	result

- Design

1. Do

- 1.1 Print the operation menu using PrintMenu()
- 1.2 Read in choice
- 1.3 Read in operand1, operand2
- 1.4 Select on choice
 - 1.4.1 Case '+'
 - 1.4.1.1 Compute result = operand1 + operand2;
 - 1.4.2 Case '-'
 - 1.4.2.1 Compute result = operand1 - operand2;
 - 1.4.3 Default case
 - 1.4.3.1 Display error message
 - 1.4.3.2 Set result to 0
- 1.5 Display result
- 1.6 Ask the user if want to do another
- 1.7 Read in answer

2. While answer is 'Y' or 'y'

Function PrintMenu

- Analysis - no objects
- Design
 1. Display a menu of choices

1. (4 points) Create a new project, then download the program `inclass12.cpp` from the course webpage and add it to your project. Build and run this program. Answer the following questions:

- a. What is the boolean expression in this program?
- b. What is the selection expression in the `switch` statement?
- c. Why does each case in the `switch` statement end with a `break` statement?
- d. When does the default case of the `switch` statement execute?

2. (6 points) Users of the calculator would like to be able to multiply and divide. Modify your program in the following way:

- Add two new menu items “* : multiplication” and “/ : division”
- Add a case for selection choices ‘*’ and ‘/’ in the case construct that computes the result for multiplication and division, respectively. Note that division by 0 is an illegal operation, so your program should handle this situation by printing out an error message and setting the result to 0.

Save your program, then rebuild and run it. Test it until you are satisfied that it works.

When you have completed this exercise, print out your program file and turn it in with one copy of this exercise sheet with your answers to the questions.