Solutions

Problem 1: A Simple Calculator (122090007_A1_calculator.cpp)

The program first gets the users' input, and named "expression". There are four main variables. "result" is used to store the final result; "current_number" is used to store the last number that the program has recognized; "current_operator" is used to store the operator that the program meets.

After getting the input, the program started to travel through the input. It used the isdigit() function to judge whether the character is a number or not. If is, the program let it be the variable "number", and check that whether the next character is a number or not. If is, the program times 10 to "number" and add the current number to let it be the right number. For example, 64 → 6 * 10 + 4.

The program then will meet the operator, and stored it into "current_operator". Judging the operator, if it is '+' or '-', it does not affect the order of calculation, so the program will first add the current number to the result, and them clear the current_number, let the number that the program reads now be the current number. If it is "*" or "/", the program will first use the current_number to do the calculation and renew the current_number. In this way we can prioritize multiplication and division.

At last, the program finish travel through the expression and there is only one current_number remained. We simply add it to the result and print out the result so the program finished.

Problem 2: Check-Tic-Tac-Toe-Game (122090007_A1_tic_game.cpp)

There are three lines of input. The program first adds them together to a string called "gameboard". We first check if there are empty or not. The program used str.find() to check whether there is 'E' or not. If no, means the game end, it output "True". If not, the program then check if there are row equal, simply check the gameboard[0] to gameboard[2] is same or not and so on. The column check is similar, check (0, 3, 6) (1, 4, 7) (2, 5, 8) is same or not. The diagonal check (0, 4, 8) and (2, 4, 6). Finally, the program prints out whether true or not.

Problem 3: Remove-Comments (122090007_A1_rem_comments.cpp)

The program defined two functions. First is used to remove block comments. It will start to remove the comment from "/*", and stop when meet "*/". Second is used to remove line comments, when meet "//", it will remove it and the things after "//" at that line. Finally, the program skips the empty line and print out the result.

Problem 4: Permutation and Combination (122090007_A1_ per_com.cpp)

The program first defined a recused function that calculate factorial. Then by the formula we define two functions calculate permutation and combination. The program uses the users input to calculate permutation and combination.