

COMP281 Assignment 1 Report

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Problem 1014

Since the first radius entered must be less than or equal to the second radius, the program accepts the first radius first and then the second radius.

The description states that the input radius is an integer, so the two radii are defined as int, and the output is described as float, so the output area and perimeter are defined as the float.

This problem will use the number 3.14 several times, so define 3.14 as a constant. Because the problem describes that the sum of the area and circumference of all circles will be output, starting with the first input radius and increasing the radius by '1' at each step until the second input radius is reached. So I use a while loop in which I calculate the area and circumference of the first input radius case and add him to the previous one, which is zero without the previous one, and before the end of the loop, add one more to the radius until the radius is greater than the second input radius, then exit the loop.

Use the format specifier in the print statement to control the precision of the output, ".3f" means output floating point numbers and controls the number of digits printed after the decimal point.

Setting frequently used quantities as constants and using the format specifier in the print statement to control the precision of the output are features of the C language.

Resources used: COMP281 Lecture 03.pdf

Problem 1018

The problem description mentions that the use of strings is not allowed, and the assignment requirements also mention that library string.h cannot be used, so I came up with the idea of using recursion to solve the problem, as I studied functional programming (Haskell) last semester, and the core of Haskell is to use recursion to do loop and solve problems.

Each time a letter is read using scanf, if the EOF end-of-file character is not read, the letter will continue to be read recursively until the EOF is read, then the letter will be printed, thus starting from the last letter and completing the output in reverse order.

In C, scanf will return EOF when it reads the end of a file stream.

Resources used: <https://www.cprogramming.com/tutorial/c/lesson16.html>

Problem 1022

1022 requires a string to be accepted and the number of characters of each type to be counted so getchar is used to obtain and determine each character by comparing the ASCII code of the character, a character greater or equal than the letter a and less or equal than z, or a character greater or equal than A and less or equal than Z means

that the ASCII code of the character is greater or equal than the letter a and less or equal than z or the ASCII code of the character is greater or equal than A and less or equal than Z, which means that the character is an English character. By the same token, if the character is equal to a space, it is a space, if it is greater than or equal to 0 and less than or equal to 9, it is a numeric character, and if it is not one of these, it is classified as other characters.

In C, getchar reads the end of the file stream and returns EOF, and compares the size of characters with other characters by ASCII code.

Resources used: <https://www.cprogramming.com/tutorial/c/lesson16.html>

Problem 1030

The question is to obtain the Nth decimal digit after A/B. Related to the numerical method of long division. The overall idea is to multiply the result of A/B by the Nth power of 10. After this calculation, the number I am looking for is the one place. Specifically, the code uses a loop to find N from the first decimal place until it finds N. When the N is greater than 0, N minus one and multiply the A by 10. The first decimal is obtained by current A / B. Since the result is type int, the number after the decimal point is omitted. Taking the remainder of A's result allows the computer to continue to calculate the next digit of the original equation.

In C, turning a floating point number directly into an int type removes the number after the decimal point.

Resources used: <https://stackoverflow.com/questions/26048153/getting-the-nth-decimal-of-a-float>

Problem 1032

Because requirements am not allowed to use system functions defined in string.h. But I want to use the strlen function is string.h, So I need to write my own function to calculate the length of the string instead. My function to calculate the length of a string takes a pointer to the string, which defaults to the string's first character, adds one to the length each time it is pointed backward and returns the length size when the pointer is at the end of the string. Use the exhaustive violent method to find substrings, with a string s1 and substring s2, the first round of the loop starts with the first character of s1, sets a position marker, and then compare with substring s2 one by one, if the comparison is the same, then the position marker is moved backward, compare the next character, if the first character is not the same, then the round of comparison is over, after the comparison is over, if the value of the position marker and s2 string length is the same, then it means that a substring is found, go to increase the value of count. A second loop is then started, starting with the second character of s1 and comparing it again, and so on.

In c, fgets reads line breaks, so I want to replace the line break with an '/0' before judging it.

Resources used: COMP281 Lecture 07.pdf