

Programming Exercises - PRO1 - Session 10

Exercise 10.01

Write a program that asks the user for a username, a password and a confirmation password. Keep asking the user until the password and confirmation passwords match. Then print out the entered username and password and exit.

Exercise 10.02

There is an old story about a wise man (in some versions of the story it's the guy who invented the game of chess) who does some kind of favor for a king (in the versions with the chess creator the favor was simply that he created that game). The king is very grateful and wants to pay the wise man some money, but the wise man presents another idea for his payment, and because it appears to be very modest the king instantly accepts. That was a mistake...

The payment idea that the wise man presented worked like this: The king should take a standard 8x8 square chessboard, and on the first square he should place a single grain of wheat, on the second square two grains, on the third square 4 grains, and so on doubling the number of grains each time he moved to the next square. His payment would then simply consist of the number of wheat grains that should be on the chessboard.

Create a program that uses a loop to calculate the number of grains on the last square of the chessboard, plus the total number of grains on the chessboard. Hint: Since the wise man was indeed wise, you will need to store the values in a double, since neither int nor long will be able to hold such large values.

Exercise 10.03

The value of π can be calculated like this: $\pi = 4 \times \left(1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \frac{1}{9} - \frac{1}{11} + \frac{1}{13} - \frac{1}{15} + \dots \right)$

The longer the series is continued the closer to the value of π the result gets.

- Create a program that uses a loop to run the above equation to calculate the value of π , and then prints it out. The program should ask the user to input for how many iterations the loop should run. Experiment with different input values to see if you can get π calculated with an accuracy of 5 decimals.
- (Optional) Modify the program so that rather than asking the user to input the number of iterations, the loop should simply continue running until the 5 decimals of accuracy is achieved. Then print out the calculated value of π and how many iterations was needed.

Exercise 10.04

[Gaddis] Algorithm Workbench 1, p. 367

[Gaddis] Algorithm Workbench 5, p. 367

[Gaddis] Algorithm Workbench 8, p. 368

[Gaddis] Programming Challenges 1, p. 370