

Sample Midterm

This are sample questions for the midterm covering conditional statements, user input, string escape characters, loops and functions. You can use the solutions as a hint of how to solve them, but you need to figure them out on your computer. You will have about 10 minutes for each question, but you will be able to use your computer and internet, however the latter without communication with other students including via chats or bulletin boards.

1. Write a function that asks the user explicitly for input from the keyboard. The function has no argument. The user enters a distance in miles and the function prints out the value in football fields. For the purpose of this exercise, a football field is 120 yards long. One mile is 1760 yards.
2. Write a function that asks the user for a number. The function then prints out a sentence patterned along the following interaction. The user enters 7 and the program prints out " 7 " is a nice number. Notice the quotation marks around 7. The program should work if the user enters the number as an English number such as 7.
3. Write a function that takes as argument two numbers x and y and returns $2a+b$, where a is the larger and b is the smaller of the numbers x and y . For example, if the user calls the function with parameters 5 and 4, then the return value is 14.
4. Calculate the following sum $\sum_{i=1}^n \frac{x^i + 1}{x^2 + 1}$ as a function of x and n .
5. Calculate the following product $\prod_{i=0}^n \frac{1 + x^i}{2 + x^i}$ as a function of x and n .
6. A function that returns the count of all numbers i between 1 and 10 000 (ends included) that fulfill simultaneously the conditions that $2 \cdot i + 1$ is divisible by five and that $i^2 + 2$ divided by four has remainder 3.