

COSC600 - Midterm Exam

NOTES:

1. Your exam is open book meaning you are free to use your text and source code we've produced in the class. Internet sources, other students, etc are not allowed.
2. You may only use things we've covered in class thus far. Loops are not allowed. For strings, the split() method is not allowed. If you are unsure of something, please ask.
3. Do not write comments. While this is expected for assignments and labs and any other work you do, it is not required for your exam so as to save time.
4. You should create one project for all of your programs. You can name it whatever you like. You are not required to create packages but you can if you want. Once complete, zip your source files and upload them. You are only required to submit the contents of your src directory. You can name your zip file whatever you like.

1. Write a program called Q1 which will input a string and two integers and print the part of the string enclosed by the two numbers, inclusive. [10 marks]

Example:

Enter a string and two numbers:

This is a string

6 8

...would print 's a' where there is a space between the letters.

2. Write a program called Q3 which will input a 4-digit number and determine if it is a palindrome. A palindrome number is a number whose digits are the same forward and backward. I.e. 1331 is a palindrome. 3473 is NOT a palindrome. You can assume that any input number will always be exactly 4 digits but you must input the number as a single four-digit integer. [10 marks]
3. Write a program called Q4 which will implement an integer number guessing game for three integer numbers. The program will randomly generate three single digit numbers and the user will enter three numbers as their guess. There are three possible outcomes: [15 marks]
 - a. The users numbers are an exact match – output "Exact Match!"
 - b. The user matches 2 of 3 numbers. – output "Close: 2 correct!"
 - c. The user matches less than 2 numbers – output "Oops. That wasn't a very good guess!"

4. Chinese New Year Zodiac is made up of 12 different animals which are used to represent years. The animals of the Chinese zodiac are, in order, rat, ox, tiger, rabbit, dragon, snake, horse, goat, monkey, rooster, dog and pig. [20 marks]

The year 2000 was the year of the dragon. The following year, 2001, was the year of the snake, 2002 was horse and so on.

Write a program called Q5 which will take a year between 2000 and 2100 as input, calculate which of the animals that year corresponds to and return a message to the user telling them what animal that year corresponds to from the Chinese zodiac.

5. All books are assigned an ISBN number. ISBN-10 numbers consist of 10 digits. The last digit is a checksum which is calculated from the first 9 digits as follows: [15 marks]

ISBN-10: $d_1d_2d_3d_4d_5d_6d_7d_8d_9d_{10}$

$$(d_1 \times 1 + d_2 \times 2 + d_3 \times 3 + d_4 \times 4 + d_5 \times 5 + d_6 \times 6 + d_7 \times 7 + d_8 \times 8 + d_9 \times 9) \% 11 = d_{10}$$

For example, if you had a set of 9 digits as 172364817 the tenth digit would calculate as

$(1 \times 1 + 7 \times 2 + 2 \times 3 + 3 \times 4 + 6 \times 5 + 4 \times 6 + 8 \times 7 + 1 \times 8 + 7 \times 9) \% 11 = 5$ so the resulting ISBN-10 will be 1723648175.

The one exception to this is if the answer calculates to 10. In that case the last digit is set to X.

Write a program called Q6 which will input a nine-digit number, calculate the tenth digit and append it to the inputted digits to produce an ISBN-10. Your program will then output the resulting ISBN-10.