

COP 3330 Suggested Exercises for Week 1

Printing

1) Play around with printing, specifically the '\t' character and give a description of exactly how it works.

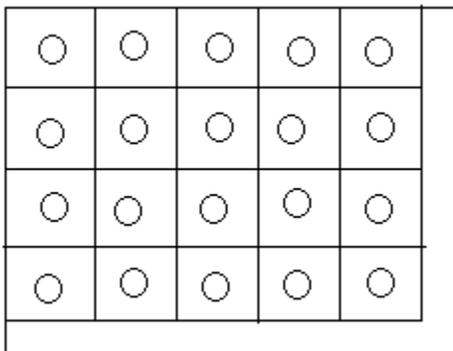
Variables, Input, Assignment Statement

2) Write a program that prompts the user to enter two points on the Cartesian plane with different x coordinates and calculates the slope of the line through those points.

3) Write a program that asks the user for the price of gasoline per gallon, the number of gallons of gas currently in their car, the miles per gallon their car gets, and the length of their road trip in miles and calculates and prints out the amount the user will have to spend on extra gas to complete the road trip. (You may assume that the user will have to buy some gas to complete the trip.)

4) Imagine a two-way straight railway and two trains approaching each other from opposite directions. You need to compute how long (in minutes) it would take for these trains to come side by side. You will also compute how many miles each train travels till then. Write a program to read in the distance (in miles), speeds of the trains (in miles per hour), and output the time to meet (in minutes) and the distance traveled by each train (in miles).

5) You want to have a program that calculates the number of pepperonis to place on rectangular pizzas. For each pizza, you want the user to be able to choose the “density” of pepperonis according to the following design:



Essentially, each pepperoni is roughly centered in a square of the pizza of some given size (perhaps 35 mm by 35 mm). We portion the rectangular pizza into as many rows and columns as we can, of this fixed size. Each of these square cells of the pizza get one piece of pepperoni. Depending on the dimensions of the pizza, some room may be leftover on the right side and bottom of the pizza that are too small to form the squares desired. These areas do not get any pepperonis.

Write a program that takes in the length and width of the pizza in millimeters, as well as the size of the bounding square for one pepperoni, in millimeters, and calculates the total number of pepperonis needed for the pizza.

If Statement

6) Add to program #2 (previous page) asking the user to enter a third point on the Cartesian plane and print out whether or not that point is on the line defined by the first two points. No need to print out the slope of the line here.

7) Augment program #6 to allow the user to enter the first two points with the same x-coordinate.

8) Two competing companies offer different bulk buying plans for buying boxes of cereal. The first 100 boxes are at one price point, the next 1000 are at a second price point and all subsequent boxes are at a third price point. Ask the user to enter the three price points for two companies as well as the number of boxes they desire to buy. Your program should print out which company they should go with and how much their purchase will cost. If both companies will provide the same price, you may choose either. Consider the price points of two companies shown below:

Company	Price for first 100	Price for next 1000	Price for rest
1	\$2.99	\$1.99	\$1.50
2	\$2.50	\$2.25	\$1.75

If we buy 2000 boxes of cereal from company 1, we spend $100 * \$2.99 + 1000 * \$1.99 + 900 * \$1.50 = \3639 . If we buy the same boxes from company 2, we spend $100 * \$2.50 + 1000 * \$2.25 + 900 * \$1.75 = \4075 . Thus, in this case, we should go with company 1.

9) Research the rule for leap years and write a program that prompts the user to enter in a year (after 1582) and prints out whether or not the year entered was/will be a leap year.

10) Write a program that determines whether or not Anna and Bob were at the restaurant at the same time. Ask the user when Anna and Bob arrived at and left the restaurant, respectively. (The user should answer in number of minutes after midnight, and assume that both arrived and left on the same day.) Determine whether or not Anna and Bob were at the restaurant at the same time, and if so, for how many minutes they overlapped. For example, if Anna arrived at 720 minutes after midnight and left 800 minutes after midnight and Bob arrived at 600 minutes after midnight and left 740 minutes after midnight, they were at the restaurant together for 20 minutes. (Note: If Bob leaves at the same time Anna arrives, then they were not at the restaurant at the same time.)