The Great Computer Challenge Visual Basic Level IV

Lottery

The new state lottery game consists 13 ping pong balls numbered 1 through 13. Each week there is a random drawing where 6 balls are selected, without replacement. Since the balls are not replaced between selections, none of the six balls selected can have the same number.

You have been tasked to write an "EASY PICK" program that generates 5 simulated lottery plays. Write a program that produces five independent sequences of six random numbers between 1 and 13 where, within the sequence, the numbers are not be repeated. Display the results with each of the five sequences sorted in ascending order.

Sample OutputPick 1:2,6,7,9,10,12Pick 2:1,3,6,7,11,13Pick 3:4,7,8,9,12,13Pick 4:2,4,5,6,8,9Pick 5:5,6,7,9,11,13

(20 points)

Pizza

It's been a late night working on Visual Basic. You and a friend are hungry and decide to order a pizza. Your local pizza joint has two sizes of pizza. One is a 1000 twip diameter pie, and the other is a 1400 twip diameter pie. The price of the 1400 twip radius pie is 1/3 more than the 1000 twip pie. You argue that it makes more sense to splurge for the larger pie because a 1400 twip diameter pie has almost twice the surface (and therefore eating) area as a 1000 twip diameter pie. Your friend doesn't believe you. Armed with the knowledge that the area of a circle is equal to PI multiplied by the radius squared, develop a project which uses the graphics **Circle** method to draw the two pies, calculate their area, and display the calculated area on a form.

(20 points)

Watch Your P's and Q's

Write a program which will display all possible orderings, called <u>permutations</u>, of the letters \mathbf{P} and \mathbf{Q} . If the display takes more than one screen, the user should have an opportunity to pause before moving to the next screen. (You wouldn't want to miss one of those lovely permutations!) Remember, a permutation cannot be repeated more than once. Here is a sample dialog for the program, though you can desing your own interaction:

How many P's (0-10)? 3 How many Q's (0-10)? 2 The permutations are: PPPOO

> PPQPQ PPQPPQ PQPPQ PQPQP PQQPP QPPPQ QPPQP QPQPP QPQPP

There are 10 permutations altogether.

Hint: There is a simple formula for the total number of permutations. Factorial (n) = n * (n-1) * (n-2) * ... * 2 * 1, and if p= number of P's chosen, and q = number of Q's chosen, then Number of permutations = <u>Factorial(p+q)</u> Factorial(P) * Factorial(q) This won't necessarily help you display the permutations, but it will tell

you how many there are.

(30 points)

Contestris

There is a four column well down which you can drop blocks. Blocks cannot change their horizontal position nor can they totate as they drop down the well; they can just pile up on top of each other. There are 10 kinds of blocks (all of which are one square high and one, two, three or four squares wide), each kind of block is denoted by a letter.

Block Description

- A Single square in the left-most column
- B Single square in the second column from the left
- C Single square in the third column from the left
- D Single square in the right-most column
- E Two square block in the two left-most columns
- F Two square blocks in the middle two columns
- G Two square block in the two right-most columns
- H Three square block in the three left-most columns
- I Three square block in the three right-most columns
- J Four square block which fills up all four columns across

Input to the Program

The user will type in 7 letters (A thru J with repetitions allowed) which tell the program the order in which the blocks are being dropped down the well.

Output from the Program

The program has to produce a diagram which shows how the blocks will stack up. The next page has a sample program dialog, though your interaction may be slightly different.

(30 points)

Sample Program Dialog

Please enter the order of the blocks (7 letters, A-J): A,A,E,D,G,I,E

E Block 7	E Block 7		
	I Block 6	I Block 6	I Block 6
E Block 3	E Block 3		
A Block 2		G Block 5	G Block 5
A Block 1			D Block 4