





## ESERCIZIO 2

## PROBLEMA

In un deposito di minerali esistono esemplari di vario peso e valore individuati da sigle di riconoscimento. Ciascun minerale è descritto da un termine che contiene le seguenti informazioni:

minerale(<sigla del minerale>, <valore in euro>, <peso in Kg>).

Il deposito contiene i seguenti minerali:

minerale(m1,591,899)	minerale(m2,536,864)	minerale(m3,587,833)
minerale(m4,562,858)	minerale(m5,545,825)	minerale(m6,558,842)
minerale(m7,573,877)	minerale(m8,594,886)	minerale(m9,529,891)

Disponendo di un autocarro con portata massima di 1700 Kg, trovare la lista L1 delle sigle di 2 minerali diversi trasportabili con questo autocarro che consente di trasportare il massimo valore possibile.

Disponendo di un autocarro con portata massima di 2550 Kg, trovare la lista L2 delle sigle di 3 minerali diversi trasportabili con questo autocarro che consente di trasportare il massimo valore possibile.

Disponendo di un autocarro con portata massima di 3400 Kg, trovare la lista L3 delle sigle di 4 minerali diversi trasportabili con questo autocarro che consente di trasportare il massimo valore possibile.

N.B. Nelle liste, elencare le sigle in ordine crescente; per le sigle si ha il seguente ordine:

m1 < m2 < ... < m9.

L1	[ ]
L2	[ ]
L3	[ ]



## ESERCIZIO 3

## PROBLEMA

Paula and Joan were selling oranges and, each day, they had an equal number of fruit but Joan had larger ones and sold them at the rate of two for a dollar, while Paula sold three of hers for a dollar. Each lady expected to sell her fruits completely (with no oranges left).

Paula had to leave for a day and asked Joan to dispose of her stock. Upon accepting the responsibility of disposing of her friend's stock, Joan mixed them together and sold them off at the rate of five oranges for two dollars.

When Paula returned the next day, the oranges had all been disposed of (not one remained), but when they came to divide the money, they found that they were just *seven* dollars short with respect to the money they would have earned selling oranges separately.

Anyway, they divided the money equally, each taking one-half. Find how much money Joan lost by the unfortunate partnership.

Enter your answer, as an integer number (of dollars), in the box below. (Taking into consideration divisors and common multiples could be helpful.)

## ESERCIZIO 4

## PROBLEMA

Si consideri la seguente procedura PROVA1.

```
procedure PROVA1;  
variables A, B float; K integer;  
A ← 0.0;  
B ← 1.0;  
K ← 0;  
while B > 0 do  
    K ← K + 1;  
    A ← A + B/16.0;  
    B ← B - A/16.0;  
endwhile;  
output K;  
endprocedure;
```

Determinare il valore di output di K.

K	<input type="text"/>
---	----------------------



## ESERCIZIO 5

## PROBLEMA

Si consideri la seguente procedura PROVA2.

```
procedure PROVA2;  
variables A, B, C, K, P integer; W float;  
A ← 1;  
B ← 3;  
W ← 0.0;  
P ← 1;  
K ← 0;  
while B > W do  
    K ← K + 1;  
    C ← B;  
    B ← A + B;  
    A ← C;  
    P ← P + P;  
    W ← P / 10.0;  
endwhile;  
output B, P, K;  
endprocedure;
```

Determinare i valori di output.

B	
P	
K	



## ESERCIZIO 6

## PROBLEMA

Si consideri la seguente procedura PROVA3.

```
procedure PROVA3;  
variables A, Q, M, J, K, N integer;  
Q ← 0;  
for K from 1 to 5 step 1 do  
  input A;  
  for J from 1 to 4 do  
    M ← A;  
    for N from 1 to 3 do  
      M ← M + K;  
    endfor;  
    Q ← Q + M + J;  
  endfor;  
  output Q;  
endfor;  
endprocedure;
```

Se i valori di input per A sono 1, 2, 3, 4, e 5 scrivere la lista L contenente nell'ordine i valori in output di Q.

L	[		]
---	---	--	---



## ESERCIZIO 7

## PROBLEMA

One day two swimmers swim lengths in a pool that is 100 m long. They start at the same time from the south end (S) of the pool, swim to the north end (N), swim back to S, then to N, and so on. They each swim at a constant speed and each turns around instantly at both ends of the pool. The swimmers are said to *cross* when they pass each other in the pool while swimming in opposite directions. We also say that they *cross* if they *arrive* at an end (N or S) at the same time.

Suppose that two swimmers, Amanda and Bob, cross at S after Amanda has swum 200 m and Bob has swum 400 m. How many times before this point did they cross?

A day later two different swimmers, Charles and David, cross at S after Charles has swum 400 m and David has swum 600 m. How many times before this point did they cross?

Put your answers, as integer numbers, in the boxes below.

Amanda and Bob	
Charles and David	

## ESERCIZIO 8

## PROBLEMA

In a sequence of 10 terms, the first term is 1, the second term is  $x$ , and each term after the second is the sum of the previous two terms. For example, if  $x = 11$ , the sequence would be

1; 11; 12; 23; 35; 58; 93; 151; 244; 395.

For some values of  $x$ , the number 463 appears somewhere in the sequence. Let  $x$  be a positive integer; what is the sum of all the values of  $x$  for which 463 appears somewhere in the sequence?

Put your answer in the box below.