

# Student Survey

## General information

What is your gender?

- Male
- Female

In which school are you studying?

- Technological school
- Scientific lyceum
- Economic school

What year do you attend?

- First
- Second
- Third
- Fourth
- Fifth

What is your average rating in Informatics?

[ Choose among: 10 / 9 / 8 / 7 / 6 / Insufficient ]

Which are your favorite programming languages? [ *multiple options are possible* ]

- |                                |                                       |                                     |                                       |
|--------------------------------|---------------------------------------|-------------------------------------|---------------------------------------|
| <input type="checkbox"/> C/C++ | <input type="checkbox"/> Java         | <input type="checkbox"/> Scratch    | <input type="checkbox"/> Python       |
| <input type="checkbox"/> C#    | <input type="checkbox"/> Visual Basic | <input type="checkbox"/> Javascript | <input type="checkbox"/> Other: ..... |

Do you think it would be needed to spend more time on some programming concepts?

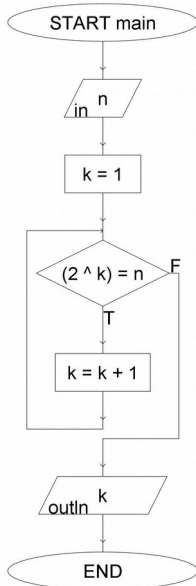
Which ones? [ *multiple options are possible* ]

- |                                                                  |                                                                         |                                       |
|------------------------------------------------------------------|-------------------------------------------------------------------------|---------------------------------------|
| <input type="checkbox"/> Variables                               | <input type="checkbox"/> Iteration loops<br><i>(while/for/do-while)</i> | <input type="checkbox"/> Recursion    |
| <input type="checkbox"/> Data types                              | <input type="checkbox"/> Arrays                                         | <input type="checkbox"/> Input/output |
| <input type="checkbox"/> Selection<br><i>(if/if-else/switch)</i> | <input type="checkbox"/> Subroutines<br><i>(functions/procedures)</i>   | <input type="checkbox"/> Other: ..... |

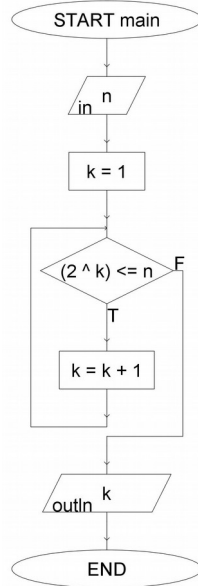
Are you usually successful in solving unfamiliar programming problems? [ *Lickert scale: 4 levels* ]

- |                       |                       |                       |                       |                       |        |
|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|--------|
|                       | 1                     | 2                     | 3                     | 4                     |        |
| Never or almost never | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Always |

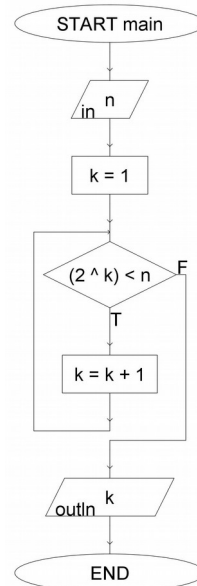
**Problem:** Design of an algorithm to determine the number of bits required to represent in binary a positive integer  $n$ ; such number of bits corresponds to the smallest exponent  $k$  such that  $2^k$  (2 raised to the  $k$ -th power) is greater than  $n$ . Which one of the proposed algorithms is correct, in your opinion?



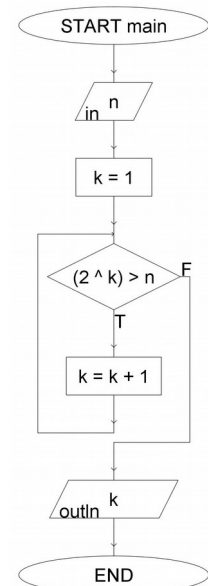
Option 1



Option 2



Option 3



Option 4

**Problem:** The program below is meant to verify if two positive integer  $m$  and  $n$  are co-primes. If the input values are  $m=15$  and  $n=44$ , how many times the *while* loop will iterate?

```

int x = m, y = n;

while ( x > 1 && y > 1 && x != y ) {

    if ( x < y )
        y = y - x;
    else
        x = x - y;
}

if ( x == 1 || y == 1 )
    printf( "m=%d e n=%d sono primi fra loro", m, n );
else
    printf( "m=%d e n=%d non sono primi fra loro", m, n );
  
```

0     1     2     3     4 or more     The loop will not terminate

**Problem:** It is assumed that the input data,  $m$  and  $n$ , of the following programs are positive integers. Two (or more) such programs are equivalent if they compute and print the same output value whenever they are executed for the same pair of positive integers  $(m, n)$ . Which ones among the five programs reported below are equivalent, in your opinion?

```
int x = m, y = n;

while ( x != y ) {

    while ( x < y )
        x = x + m;
    while ( x > y )
        y = y + n;
}

printf("risultato: %d", x);
```

Program 1

```
int x = m, y = n;

while ( x != y ) {

    if ( x > y )
        y = y + m;
    else
        x = x + n;
}

printf("risultato: %d", x);
```

Program 2

```
int x = m, y = n;

while ( x != y ) {

    while ( x < y || x > y ) {
        x = x + m;
        y = y + n;
    }
}

printf("risultato: %d", x);
```

Program 3

```
int x = m, y = n;

while ( x != y ) {

    if ( x < y )
        x = x + m;
    else
        y = y + n;
}

printf("risultato: %d", x);
```

Program 4

```
int x = m, y = n;

while ( x != y ) {

    if ( x < y )
        x = x + x;
    else
        y = y + y;
}

printf("risultato: %d", x);
```

Program 5

Have you been unsuccessful in achieving your programming tasks because of a lack of clear understanding of some mathematical/logic concepts? Which ones? [ *multiple options are possible* ]

- |                                                              |                                                     |                                               |                                                               |
|--------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------|---------------------------------------------------------------|
| <input type="checkbox"/> Boolean algebra and logic operators | <input type="checkbox"/> Concept of variable        | <input type="checkbox"/> De Morgan's formulae | <input type="checkbox"/> knowledge/meaning of terms and words |
| <input type="checkbox"/> Concept of function                 | <input type="checkbox"/> Basic concepts of geometry | <input type="checkbox"/> Set theory           |                                                               |

Which kind of errors has been most penalizing for your grading?

.....

What do you find most difficult when trying to use a loop?

- Identifying the loop condition for the *while* or *do-while* constructs
- Defining a complex condition, using logic operators (AND, OR, NOT, XOR)
- Dealing with nested loops
- Realizing, in general, when a loop must terminate to iterate
- Dealing with a variable that counts the iterations

Are the informatics topics you learnt in accordance with your expectations? [ *Lickert scale: 4 levels* ]

- |            |                       |                       |                       |                       |                |
|------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------|
|            | 1                     | 2                     | 3                     | 4                     |                |
| Not at all | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Yes, I'm happy |

Do you have any suggestion to make learning informatics more interesting?

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