

Informatics 3, Written exam 1 (sample) (2024-04-12)

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1. The following code should print the first 10 prime numbers. There are 2 logical errors in the code. What are these? (No need to fix the code, a few sentences to describe the errors is enough.) (10 points)

```
#include<iostream>
using namespace std;

bool prim(int n) {
    for(int i = 2; i < n; i++) {
        if(n % i == 0) {
            return false;
        } else {
            return true;
        }
    }
}

int main(void) {
    for(int i = 0; i < 10; i++) {
        if(prim(i)) {
            cout << i << endl;
        }
    }
    return 0;
}
```

2. Write a function called *shopping*. The function takes 2 equal sized arrays and their size: (10 points)

- *amount* contains how many we bought from the given item, *int* array,
- *price* contains how much the given item costs, *float* array.
- *hossz* contains how many items there are, in other words the size of the arrays, simple *int*.

The function should return how much we have to pay for all the bought items. Write a simple *main* function as well to test the function (2-3 items is enough).

3. Write a function that finds the first and last occurrence of a given character in a given C string and returns their indexes. The function takes: (10 points)

- a C string in which we're searching, *char* array.
- a character we're looking for, simple *char*.
- additional parameters based on the solution method.

4. Write a Polygon class that's able to represent an arbitrary planar polygon. *(10 points)*

- It should have a constructor that takes the arrays of the x and y coordinates and constructs the polygon from them.
- It should have *area* and *circumference* methods.
- If needed it should have a destructor as well.

You only need to implement the constructor and the destructor.

5. Given the usual linked list: *(10 points)*

```
struct list_e {  
    int num;  
    struct list_e *next;  
};
```

Write a function that tells whether a given value is in the list or not. Its parameters are:

- *start*, pointer to the first element of the linked list, *struct list_e**.
- *elem*, the value we're looking for, simple *int*.