236319
Programming Languages
HW01
Dry

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1.1

The expression outputs the string "s a f 0 t", and is written in a compressed and obfuscated style. This style is sometimes used in code golf, where the goal is to write code that is as short as possible, or in obfuscation challenges, where the goal is to make the code difficult to understand or reverse-engineer.

1.2

The following command:

```
console.log(+!+[]+!+[],
            +!+[]+!+[]+!+[],
            +!+[]+!+[]+!+[]+!+[]+!+[]+!+[]+!+[],
            +!+[]+!+[]+!+[],+!+[],
            +!+[]+!+[]+!+[]+!+[]+!+[]+!+[]+!+[]+!+[]+!+[])
```

outputs 2 3 6 3 1 9.

2

2.1

```
fun factorial n : int = if n = 1 then n else (factorial (n - 1)) *
    n;
```

2.2

```
fun fibonacci n : int = if n = 1 then 0 else if n = 2 then 1 else
    fibonacci(n - 1) + fibonacci(n - 2);
```

3

3.1

Both Pascal and C programming languages support the concept of enumerations, which allow you to define a set of named constants with underlying integer values. However, there are some differences in how enumerations are implemented and used in Pascal and C. Here are some of the main differences:

Syntax: In Pascal, you define an enumeration type using the "type" keyword, followed by the name of the type and the list of possible values In C, you define an enumeration type using the "enum" keyword, followed by the name of the type and the list of possible values (each separated by a comma).

Default Values: In Pascal, the first value in an enumeration list is assigned the value 0 by default, and each subsequent value is assigned the next integer value. However, you can explicitly assign values to each member if you want. In C, the first value in an enumeration list is assigned the value 0 by default, and each subsequent value is assigned the next integer value. However, you can explicitly assign values to each member if you want.

Scope: In Pascal, enumeration types are defined at the same level as other types, such as records and arrays. They can be used in any part of the program where a type is expected.In C, enumeration types are usually defined in the global scope (outside of any function), and can be used in any part of the program where a type is expected. However, you can also define enumeration types within a function, in which case they can only be used within that function.

Type Safety: In Pascal, enumeration types are distinct types that are not compatible with other types, even if they have the same under- lying integer values. In C, enumeration types are represented as integers, and are compatible with other integer types.

3.2

In Pascal, a set type is a special type that represents a collection of distinct values of a given base type. There are some restrictions on set types in Pascal:

1. The base type must be an ordinal type, which means it can be ordered and assigned integer values. This includes integer, char, boolean, enumeration types, and subrange types.

2. The maximum number of elements in a set depends on the size of the base type. For example, if the base type is an enumeration with 8 values, the maximum number of elements in the set is 256 (2^8).

3. The elements of a set are represented as bits in memory, and the size of a set depends on the number of elements in the base type. For example, a set of days of the week requires one byte of memory, since there are 7 elements.

The restrictions on set types exist for several reasons:

Efficiency: By representing sets as bit patterns in memory, Pascal can perform set operations such as union and intersection using

Type Safety: By restricting sets to ordinal types, Pascal ensures that set operations are meaningful and well-defined.

Compiler Compatibility: The restrictions on sets were designed to ensure that Pascal programs could be compiled and executed on a wide range of computer architectures and operating systems.