236319
Programming Languages
HW01
Dry

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April 2023

1

1.1

The expression outputs the string "s a f 0 t". It is written in JSFuck, which is a style of writing JS code using only the following characters: `()[]+!`.

1.2

The following command:

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

outputs `2 3 6 3 1 9`.

2

2.1

```
fun factorial_aux n prod =
    if n = 1 then
        prod
    else
        factorial_aux (n - 1) (prod * n);

fun factorial n =
    factorial_aux n 1;
```

2.2

```
fun fibonacci_aux n prev curr =
    if n = 0 then
        prev
    else
        fibonacci_aux (n - 1) (curr) (prev + curr);

fun fibonacci n =
    fibonacci_aux n 0 1;
```

3

3.1

Here are some of the differences between enum in C and enum in Pascal:

- In C, the enum type is weak, meaning you can treat any enum variable as if it was an integer, and so compare it to integers, increase and decrease it to your liking, etc... In Pascal however, enums are their own type, and so cannot be compared or treated as integers unless explicitly cast to the integer type (using the **ord** function).
- In C, since enums are treated as integers, they can also be assigned values that don't have any meaning for their enum type. In Pascal, the values of enum variables can only be within the enum's range, meaning you can't increase, decrease, or assign an enum variable outside of the range of values defined in the enum type.

3.2

Here are some of the restrictions (and their reasoning) on the **set** type in Pascal:

- A **set** cannot contain multiple elements of the same value. This is due to the fact that sets in Pascal are supposed to mimic mathematical sets, and mathematical sets are defined such that you cannot have the same element multiple times in a set.
  - A restriction that stems from this is that sets of any type are limited in size to the size of that type. e.g. boolean sets are restricted to having a maximum of 2 elements (true and false).

- A **set** can only contain members of a single type. Moreover, a set can only contain members of ordinal types with a range between 0 and 255, and so any set can contain at most 256 elements. This restriction stems from the implementation of sets in Pascal, as they are implemented as an array of bits, each indicating whether an element is or isn't a part of the set.