inzva Algorithm Programme 2018-2019

Bundle 2

Algorithms - 1

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Contents

1 Basics

1.1 Listing

A list example from intro-1 document:

- `ls` - list files in current directory. Usage: `ls`

- `cd` - change directory. Usage: `cd ~/Desktop`.

- `mkdir` - make a new directory. Usage: `mkdir directory_name`

- `mv` - move command(cut). Usage: `mv source_path destination_path`.

- `cp` - copy command. Usage: `cp source_path destination_path`

- `rm` - remove command. Usage: `rm file_path`

1.2 Links and References

Link to inzva web page.

"A computer would deserve to be called intelligent if it could deceive a human into believing that it was human."[1]

1.3 Pages

After this points, we can clear the remaining part of the page with **cleardoublepage** command

2 Codes and Math

2.1 Codes

2.1.1 C++

```cpp
int fibonacci( int n ){

        int result = 1, previous = 1;

        for( int i=2 ; i<=n ; i++ ){
                int tmp = result;
                result += previous;
                previous = tmp;
        }

        return result;
}
```

2.1.2 Python

```python
class Fraction:

        def __init__(self, numerator, denominator):
                self.numerator, self.denominator = numerator, denominator

        def bigFraction(a, b):

                if a.numerator * b.denominator > a.denominator * b.numerator:
                        return a

                return b

a, b = Fraction(15, 20), Fraction(12, 18)  # Create two Fractions in order to compare them
biggest = bigFraction(a, b)

print(biggest.numerator, biggest.denominator)
```

2.2 Mathematical Formulas

You can write mathematical formulas between $ symbols. Examples:

$\frac{f(x+h)-f(x)}{h}$, $[2, \sqrt{N}]$, $h\sum_{i=1}^{r} i^2$, $f(x) = x^{\frac{3}{5+x}} \cdot (x-20)$

You can use double $ for formatting:

$$\int_0^2 f(x)dx = (c + 0.2 * 2 + 12.5 * 2^2 + 2^3) - (c + 0.2 * 0 + 12.5 * 0^2 + 0^3) = 58.4$$

2.2.1 Functions With Cases

$$f(n) = \begin{cases} 1 & \text{if } n = 0 \text{ or } n = 1 \\ f(n-1) + f(n-2) & \text{if } n > 1 \end{cases}$$

References

[1] "Computing Machinery and Intelligence". Book by Alan Turing, 1950.