Algorithms and their history

A presentation for the euro math 2011 by
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Introduction

Ladies and gentlemen,

Dear fellow students,

I am happy to be given the chance to participate in this conference. I would like to share my thoughts with you, concerning this particular branch of mathematics.

Generally and the definition

An algorithm

- Is a sequence of clear rational operations

- Aims at the solution of the problems

- Has a finite and time

$$\begin{tikzcd} & \text{problem} \arrow[d] & \\ & \text{Algorithm} \arrow[d] & \\ \text{Input} \arrow[r] & \text{Computer} \arrow[r] & \text{output} \end{tikzcd}$$

Characteristics

- Its programming language
- Its sequence
- Its selection
- Its repetition/ iterations

The characteristics of the Programming languages

- Their own syntax

- Their own vocabulary

Programmatic languages

- Fortran
- Cobol
- Pl/I
- Pascal
- Ada
- Basic
- Logo

Pseudocode

Pseudocode is a code having with the nowadays rapid development of technology educational objectives. Unlike with the computer or the programming languages identifies more and more with mathematics because it uses more mathematical symbols

History

- During the Middle Ages the term meant the performing of four mathematical calculations.
- Immediately linked to decimal numbering system.
- They originated in Arabia
- Their name is misspelling of the writer's name Al- Kuarismi

Secant method if f(x)=0

$$\lambda = \frac{f_0}{x_0 - x_2} = \frac{f_1}{x_1 - x_2}$$

$$f_0(x_1 - x_2) = f_1(x_0 - x_2)$$

$$(-f_0)x_2 + f_1 x_2 = (-f_0)x_1 + f_1 x_0$$

Secant method

$$(f_1 - f_0)x_2 = f_1 x_0 - f_0 x_1$$

$$x_2 = \frac{f_1 x_0 - f_0 x_1}{f_1 - f_0}$$

An algorithm for secant method

- REM SECANT METHOD FOR SOLUTION OF NON-LINEAR ALGEBRAIC EQUATION F(X)=0

```
INPUT XO,   XI,   E
10 FO = XO *   (XO - 1!)   *  (XO + 1!)
FI  = XI  *   (XI   -   1!)   *   (XI  +  1!)
X2  =   (FI  * XO   -  FO   *  XI)   /   (FI  -  FO)
PRINT X2
XO = XI X1   = X2
IF ABS(X1  - XO)   > E GOTO 10
PRINT  '_____________'
END
```

Euclid’s Algorithm in use

- The greatest common divisor of the numbers 124 and 34.

a	b	exemplification
124	34	124>34
34	22	22=124 mod 34 (22 is the residual of 124/34)
22	12	12=34 mod 22 (12 is the residual of 34/22)
12	10	…..
10	2	….
2	0	When the b or the a is 0 the algorithm terminate and 2 is the greatest common divisor

Euclid's algorithm in Basic

- *REM Euclid's algorithm for greatest common divisor*
- *PRINT "Type two integers greater than 0"*
- *INPUT A,B*
- *IF B=0 THEN GOTO 80*
- *IF A > B THEN GOTO 60*
- *LET B=B-A*
- *GOTO 20*
- *LET A=A-B*
- *GOTO 20*
- *PRINT A*
- *END*

Consulting bibliography

- Encyclopedia domi
- Introduction to Contemporary Information Technology
- Wikepedia.org

Conclusion

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