



ABOUT LEARNING TO PROGRAM

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BACKGROUND – MY INTRODUCTION TO PROGRAMMING

WHERE

- Zimuto High School,
Masvingo, Zimbabwe

WHEN

1999 – 2002 Ordinary Level
(GCE O' Level),

- Subject – Computer Studies
- Language – BASIC/DBASE
III

STAGES

1. Define The Task/Tasks
2. Write an Algorithm/ Pseudocode
3. Write Code
4. Debug And Test
5. Deploy

DEFINE THE TASK/TASKS

- The first important task/stage in programming.
- Understand what it is you are required to do.
- Break down the question/project/task into small tasks.
- Can use either bottom/up or top/down modular approach.

EXAMPLE – DEFINE THE TASKS

PROBLEM

- Consider a sales rep of a network marketing company selling goods in ZAR but paying in USD. Calculate the USD value of order after discount. Discount rate ranges from 20% to 35% depending on order size. Forex rate uses current rate. The following discount rates apply for a given order size:

DISCOUNT RATES

Order Size (ZAR)	Discount Rate (%)
<= 900	20
901-1800	25
1801-2700	30
2701 -	35

WRITE AN ALGORITHM/PSEUDOCODE

- Step by step instructions written in a plain/natural language, e.g. English, Portuguese, etc., which show the actions to be taken in order to achieve a particular goal.

ALGORITHM/PSEUDOCODE

Start

Enter the total_value of order in ZAR

Enter the current_rate USD:ZAR

Determine the discount rate*

Calculate total value in USD*

Calculate discount*

Calculate amount to be paid*

Return total value in ZAR, total value in USD, discount and amount to be paid

End

ALGORITHM/PSEUDOCODE – DETAILED

DETERMINE DISCOUNT RATE

*If $\text{total_value} \leq 900$ then
 $\text{discount_rate} = 20\%$

Else if $\text{total_value} \leq 1800$ then
 $\text{discount_rate} = 25\%$

Else if $\text{total_value} \leq 2700$ then
 $\text{discount_rate} = 30\%$

Else $\text{discount_rate} = 35\%$

End if

CALCULATE TOTAL VALUE IN USD AND DISCOUNT RATE

* $\text{total_value_usd} = \text{total_value} /$
 current_rate

* $\text{discount} = \text{total_value_usd} * \text{discount_rate}$

* $\text{amount_due} = \text{total_value_usd} - \text{discount}$

WRITE CODE

- Write the program using the syntax of the chosen programming language.
- Done in the program's development environment to enable testing.
- In our case, python, using an IDE of your choice.

IF... STATEMENT - PYTHON

if total_value <= 900:

discount_rate = 0.20

elif total_value <= 1800:

discount_rate = 0.25

elif total_value <= 2700:

discount_rate = 0.30

else:

discount_rate = 0.35

IF... STATEMENT – C

```
if (total_value <= 900) {  
    discount_rate = 0.20;  
}  
else if (total_value <= 1800) {  
    discount_rate = 0.25;  
}  
else if (total_value <= 2700) {  
    discount_rate = 0.30;  
}  
else {  
    discount_rate = 0.35;  
}
```

IF... STATEMENT – C++

```
if total_value <= 900 {  
    discount_rate = 0.20;  
}  
else if total_value <= 1800 {  
    discount_rate = 0.25;  
}  
else if total_value <= 2700 {  
    discount_rate = 0.30;  
}  
else {  
    discount_rate = 0.35;  
}
```

IF... STATEMENT – VISUAL BASIC

If total_value <= 900 Then

discount_rate = 0.20

Elseif total_value <= 1800 Then

discount_rate = 0.25

Elseif total_value <= 2700 Then

discount_rate = 0.30

Else

discount_rate = 0.35

End If

COMPARISON BETWEEN PSEUDOCODE AND CODE

ALGORITHM/PSEUDOCODE

CODE/PROGRAM

- Semantics –
meaning of your
code

- Syntax – grammar of
your code

DEBUG AND TEST

- Involves testing the program to determine if it is working as expected.
- Process is repeated until the program is running without errors and giving required output.
- Normally takes up most of the programmer's time.
- Code normally tends to yield unexpected results.

DEPLOY

- Package your application for deployment and start using your application.
- Different languages deploy applications in a different manner.
- You therefore need to know how to deploy/publish your app using your IDE.

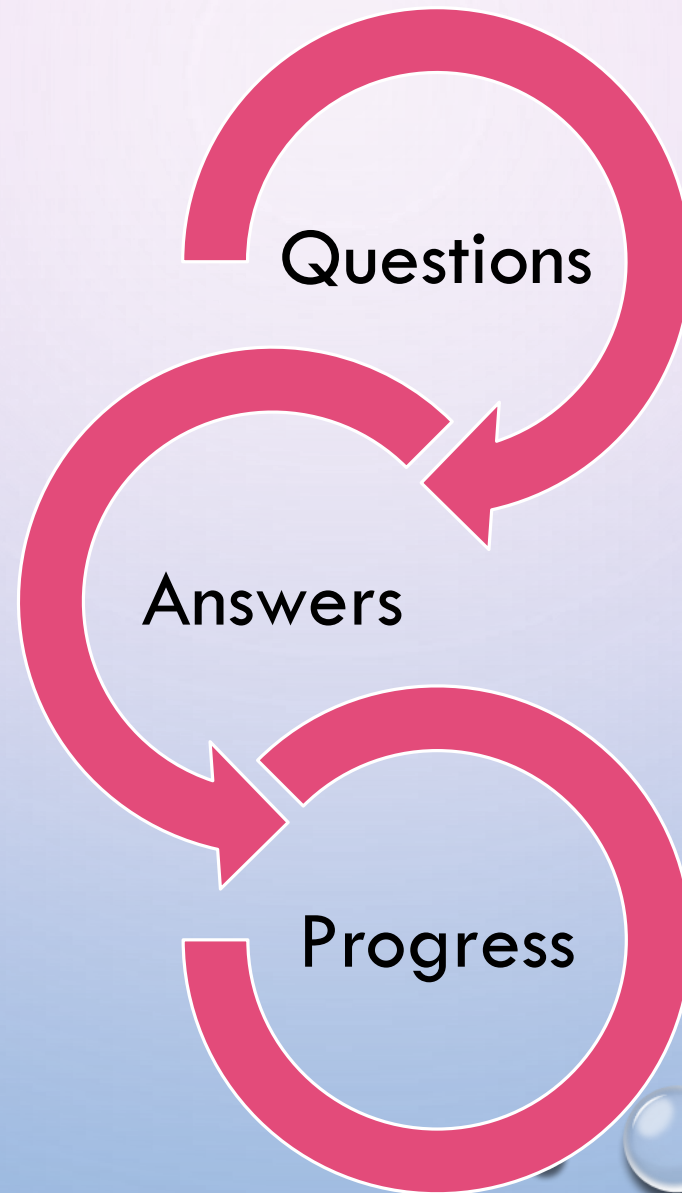
RESOURCES USED IN LEARNING PROGRAMMING

2000s

- Textbooks
- Teacher's notes and guidance
- Projects by students before you

2010 - DATE

- Textbooks
- Teacher's notes and guidance
- Projects by students before you
- Internet - many websites, videos including Stackoverflow, Github, MVA, etc.
- PyCons and many other conferences
- Learning to program has never been this easy!!!





Thank You!

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