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 total_value <=900 then

discount_rate = 20%

Else if total_value <= 1800 then

discount_rate = 25%

Else if total_value <= 2700 then

discount_rate = 30%

Else discount_rate = 35%

End if

CALCULATE TOTAL VALUE IN USD AND DISCOUNT RATE

*total_value_usd = total_value /

current _rate

*discount = total_value _usd *

discount_rate

*amount_due = total_value _usd –

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

- Semantics – meaning of your code

CODE/PROGRAM

- Syntax – gramma 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.

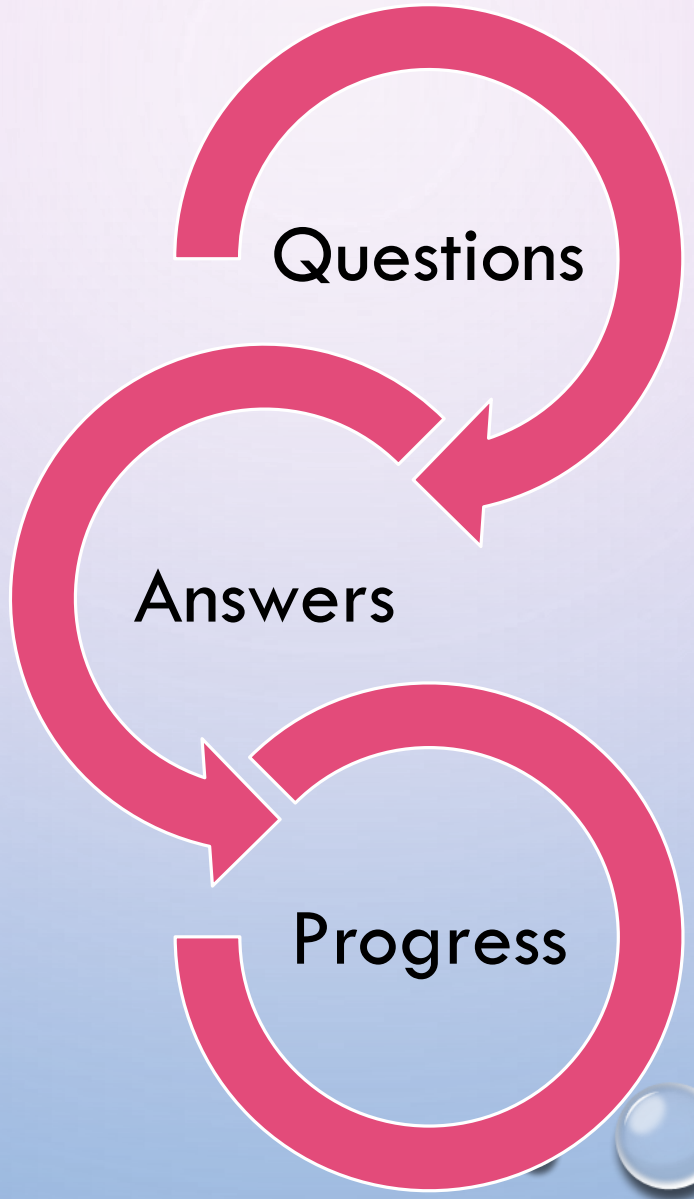
RESOURCES USED IN LEARNING PROGRAMMING

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!!!


Questions
Answers
Progress

Thank You!

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