CST0006 – Computer Programming Foundations

INTRODUCTION to WEEK03

In this lecture and lab section we are going to think in terms of algorithms by designing two types of pre-code systems. You should NEVER start writing any part of a program until you understand the problem you want to solve, then break each solution into a set of steps (an algorithm) that will solve your problem.

Algorithms are the steps you need to take to solve a problem. Algorithms allow you to break a problem you are trying to solve into a sequence of simple steps. These simple steps will allow you to focus on the task you are trying to solve and not about the rules and syntax of programming languages. It's always encouraged to create an algorithm for each problem you are trying to solve. Following this advice will allow you to write clean, logical programs, save time and stay focused on each step in the solution you are creating.

Defining the steps in an algorithm, will keep you from going insane. It keeps you focused on the problem you are trying to solve, by breaking the solution into bite-sized programmable tasks.

For this lab we are going to use an open source, cross platform office suite called LibreOffice. LibreOffice is the successor to OpenOffice which was acquired by Oracle when it purchased Sun Microsystems.

Download LibreOffice here: https://www.libreoffice.org

Pseudocode

Pseudocode is a descriptive language, written in English instead of a programming language. It still follows the basic idea of statements, it doesn't follow the syntactic rules of programming languages.

Here is an example of the Pseudocode for serving someone alcohol:

```
START

BEGIN LOOP

PRINT   What is your age?

GET     user's age

STORE   age variable into users_age

IF users_age > 18

    THEN

        DO  serve alcohol
        END LOOP

    ELSE

        PRINT 'You're too young!'
        LOOP

FINISH
```

Pseudocode Solution

We are going to create Pseudocode to boil an egg in **LibreOffice Writer**. For this you will take the **available instruction set** and the **available items list** and create a solution for boiling an egg. You don't have to use all the instructions, but they are there if you need them.

Here are the rules we are going to use for our Pseudocode.

Available Instructions

START

DO

PRINT

GET

STORE

IF/THEN/ELSE

BEGIN LOOP/LOOP/END LOOP

FINISH

Available Items

Egg, Water, Pot, Heat, Time

NOTE: You don't need to go into an in-depth description about opening a cupboard and getting a pot, just say:

DO get pot

DO put water into pot

DO put pot on heat

…

Marking

1 mark for a correct algorithm to solve the problem

1 mark for using a LOOP

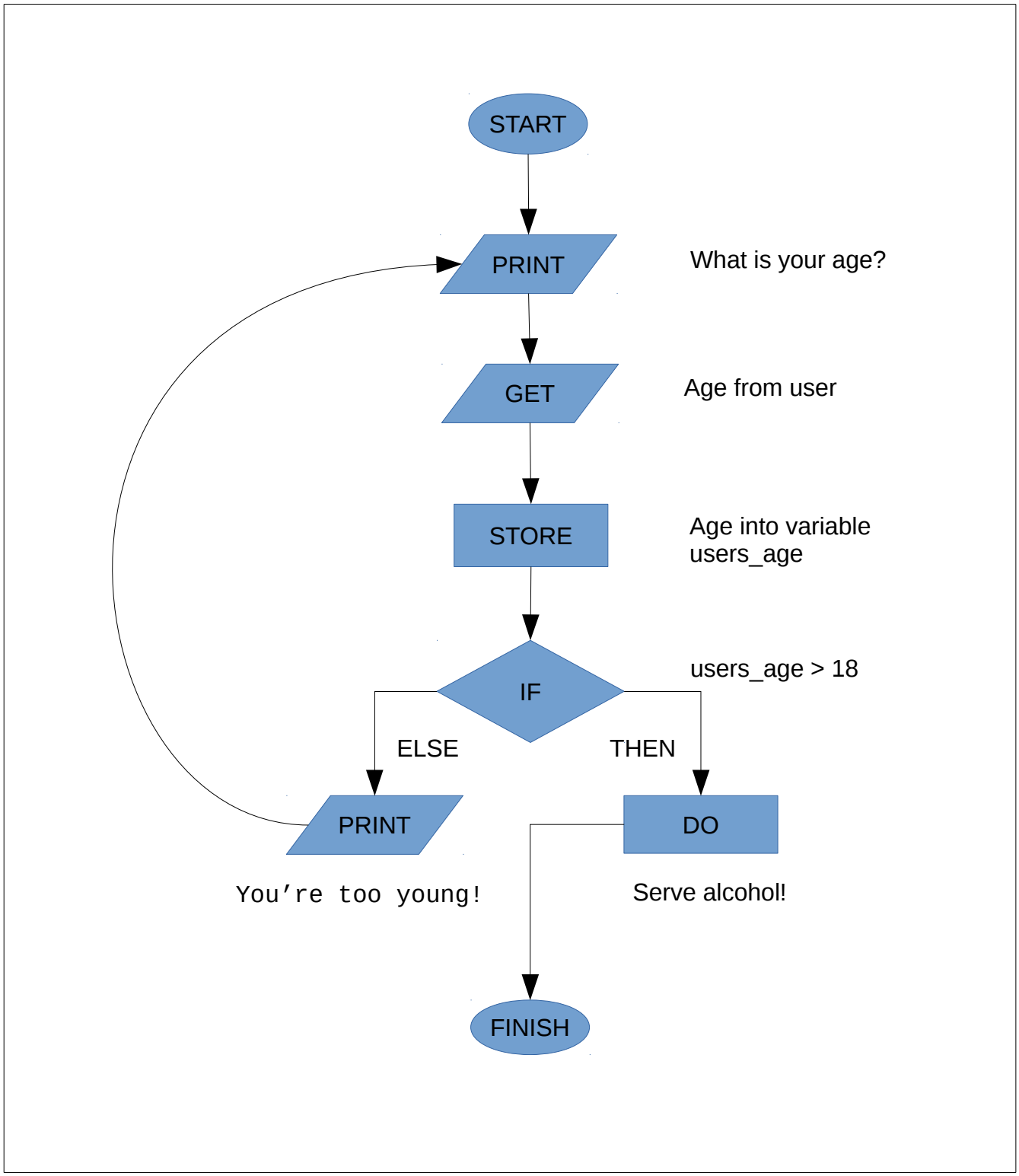
1 mark for using an IF (to make a decision)

1 mark for using the time item

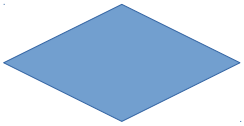
1 mark for saving your document as a PDF and submitting it to blackboard

Flowcharts

Flowcharts are a simple diagram that uses a set of symbols to represent the types of steps needed to create a solution to a given problem.



Flowchart Programming Symbols

Symbol	Name	Function
	START/END	Oval represents a start or end point
	ARROW	Arrow represents a connector that shows relationships and logic flow from one state to the next
	INPUT/OUTPUT	Parallelogram represents input and output
	PROCESS	Rectangle represents a process
	DECISION	Diamond represents a decision and will show the results of an IF statement True/False will show different arrow paths

Flowchart Solution

Since you have already created Pseudocode, this step is already half-done. You just need to create a flowchart of each step created of your Pseudocode. Use the above programming symbols to create the flowchart **LibreOffice Draw**.

Marking

1 mark for a similar solution as your Pseudocode

1 mark for using a using the correct shapes

1 mark for using an showing an arrow that loops

1 mark for using START/END properly

1 mark for saving your document as a PDF and submitting it to blackboard