

# CSIS 104 –Intro. To Computer Science

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# Evaluation Policy

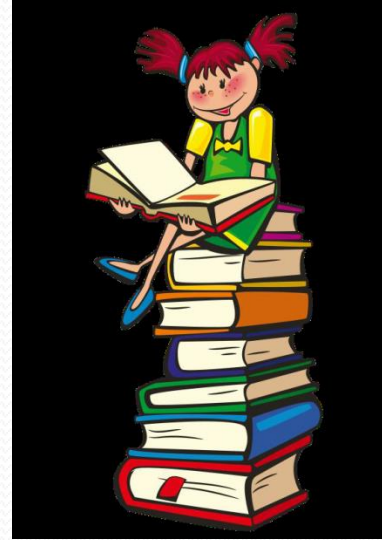
- 3 Quizzes(Best2outof3) 25%
- Assignment 10%
- Final 65%

# Course Policy

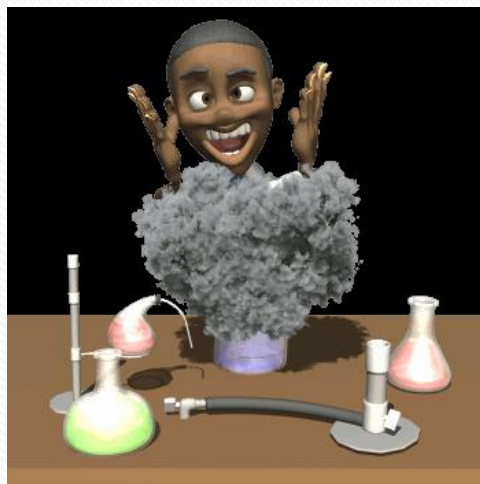
- You are advised to attend the lecture and to take notes.
- You are not allowed to attend in any tutorial other than your assigned one, under any circumstances.
- If you are late more than 15 minutes, you are counted absent.
- Prepare each week's material before entering the lab, ask questions, use the office hours.
- Each T.A. is offering 2 office hours.

# Material & Notifications

- <http://met.guc.edu.eg/Courses/Material.aspx?crsEdId=781>



# Motivation



- Simulate the chemical reactions on the computer

# Objectives

- Improving reasoning abilities to solve problems.
- Learning about programming languages.
- Modeling biology and chemistry real-life scenarios efficiently.
- Understanding industry-standard programming practice and design.
- Do NOT study by heart the definitions!

# What is Algorithm ? “Informally”

- **Algorithm:**
  - Is a step by step method for solving a problem
- **Example of a problem:**
  - **Calculate your GPA:**
    - Insert the grades
    - Sum the grades
    - Divide them by the no. of subjects
    - Write the output



# What is Algorithm ? “Informally”

- **Computing agent:**
  - Is an entity capable of performing the steps described in the algorithm, that is, executes the algorithm. This could be:
    - a person
    - a robot
    - a living cell (of an organism or a bacteria)
    - a computer
- If we can specify an algorithm to solve a problem, then we can automate its solution



# What is Algorithm ? “Informally”

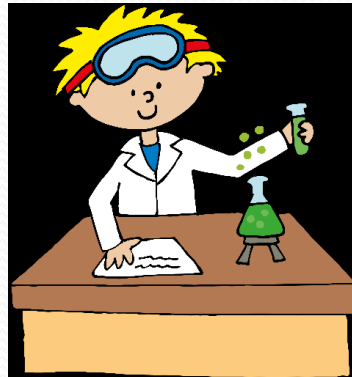
- **Computer Science:**
  - **Is the study of algorithms, including:**
    - Their formal and mathematical properties
    - Their hardware realizations
    - Their linguistic realizations
    - Their applications

# What is Algorithm ? “Informally”

- **Why use a computer?**
  - Computers are fast
  - They can store very large amount of information
  - They are not task specific
  - Their tasks can be automated:
    - computers are excellent at performing the same task over and over again on similar pieces of data.

# What is Algorithm ? “Formally”

- Algorithm:
  - Is a well-ordered collection of unambiguous and effectively computable operations that, when executed, produces a result and halts in a finite amount of time.

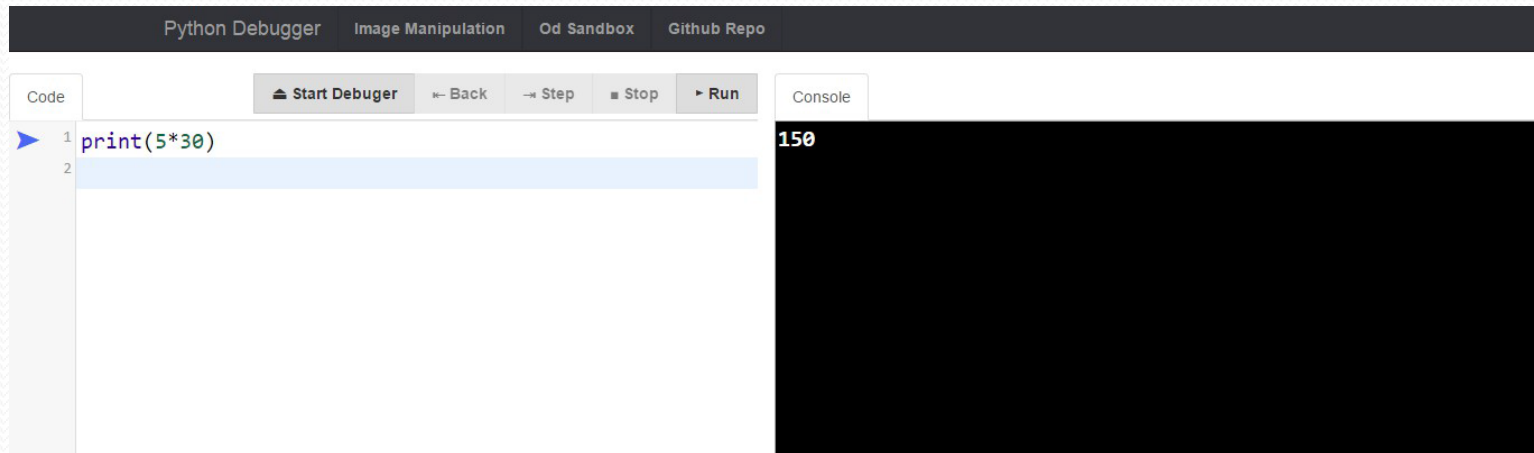


# What is Algorithm ? “Formally”

- **An algorithm is well-ordered:**
  - Each step of the algorithm is executed in the order in which it is written, or else the order is clearly stated.
- **An algorithm is unambiguous:**
  - The algorithm must be clearly stated, in terms that the computing agent (e. g., computer) understands (e.g. sign).
- **An algorithm is effectively computable:**
  - It must be possible for the computing agent to perform the operation and produce a result (no division by zero).
- **An algorithm must halt in a finite amount of time:**
  - A must even if it would take centuries to finish.

# Python Debugger

- <http://amrdraz.github.io/python-debugger/>
- <http://student.guc.edu.eg/intranet/Faculties/media%20Engineering%20Technology/Software/python-debugger/>



The screenshot displays a web-based Python debugger interface. At the top, there is a dark navigation bar with the following tabs: "Python Debugger", "Image Manipulation", "Od Sandbox", and "Github Repo". Below this, a control bar contains buttons for "Start Debugger", "Back", "Step", "Stop", and "Run". The main area is split into two panels. The left panel, labeled "Code", shows a code editor with two lines: line 1 contains `print(5*30)` and line 2 is empty. A blue arrow cursor is positioned at the start of line 1. The right panel, labeled "Console", has a black background and displays the output `150` in white text.