LEARN PROGRAMMING

STUDY GROUP - SESSION #2

Weekly: Wednesday 19:15 to 22:15
R307 G29

WHO ARE WE?

- International FIN students.
- Masters in DKE/DE
- Have few years of experience with software development.
- Programming Language expertise C/C++, C#, Java, Python, R

Volunteers

Asema Hassan - MS(DE)

Rahul Jethwani - MS(DE)

Shadi Akhras - MS(DKE)

Axel Garcia - MS(DE)

Jatin Garg - MS(DKE)

Jawad Ahmad - MS(DE)

Kantha Raju - MS(DKE)

WHO ARE WE?

Asema Hassan

Past:

-MS(CS) with AI

-3 years mobile game development experience from Islamabad, Pakistan.

-Lecturer of Game design and Development

Present:

MS(DE) - 4th Semester

Working as Research Assistant/Developer in DZNE Oct'15

MS Thesis

Languages: C/C++, Objective C, C#, Java

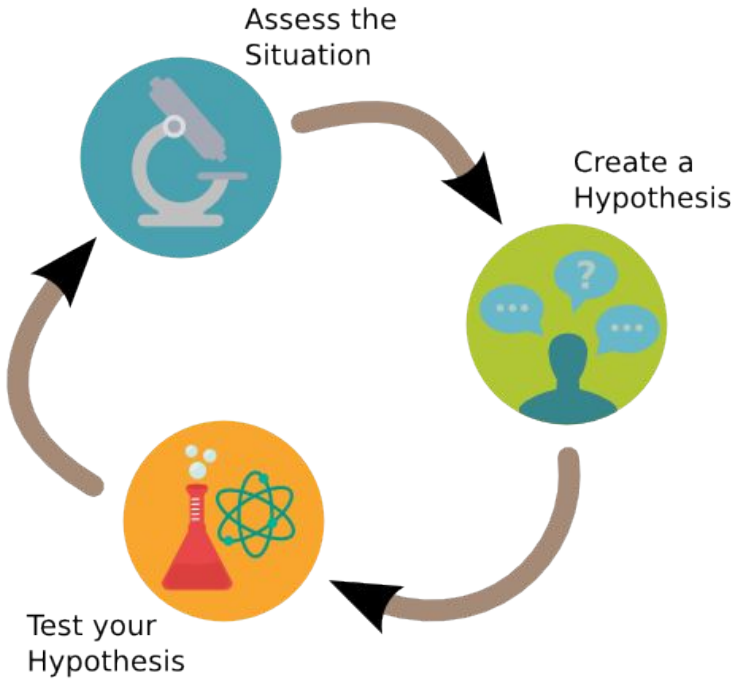
Linkedin: https://de.linkedin.com/in/asema-hassan-00682258

What is OUR PLAN?

- **Programming basic concepts**
- **Problem solving**
- **Pseudocode**
- **Flowcharts**
- Algorithms
- Syntax
- Compiling
- Debugging
- Bug fixing
- PRACTICE..PRACTICE..PRACTICE

PROBLEM SOLVING

1. Identify problem
2. Make a plan to solve problem
3. Divide problem into sub-tasks
4. Solve each tasks, step-by-step
5. Combine solution of sub-tasks
6. Test the solution
7. Does it solve the problem? YES/NO
8. End



PROBLEM SOLVING

Developing an **Algorithm** is really just a type of Problem Solving.

-We have to:

READ and understand the problem

THINK about different solutions to the problem

DESIGN an approach that will solve the problem

IMPLEMENT that design

TEST to see if it works

PSEUDOCODE

A simple human **readable** notational language to solve a problem. **You are describing a logic plan to develop a program, you are not programming**

RULES:

1. Write only one statement per line
2. Capitalize initial keyword
3. Indent to show hierarchy
4. End multi-line structures
5. Keep statements language independent

Keywords: **READ, WRITE, IF, ELSE, ENDIF, WHILE, ENDWHILE**

PSEUDOCODE (CGPA CALCULATOR)

```
BEGIN
INITIALISE counter =1
INITIALISE totalGradePoints = 0
INITIALISE totalCreditPoints = 0
INITIALISE numOfCourses = 0
INITIALISE cgpa = 0
READ numOfCourses
```

```
WHILE counter<=numOfCourses
    READ courseGP
    READ courseCP
    totalGradePoints += (courseGP*courseCP)
    totalCreditPoints +=courseCP
    counter +=1
ENDWHILE
cgpa = totalGradePoints/totalCreditPoints
WRITE “Average grade is: ” cgpa
END
```

Control Conditions vs LOOPs

Conditional Statements

IF-ELSE-ENDIF

IF-ELSEIF-ELSE-ENDIF

SWITCH-CASES

LOOPs

FOR

WHILE

DO-WHILE

Control Conditions vs Loops

Conditional Statements

IF-ELSE-ENDIF

IF-ELSEIF-ELSE-ENDIF

SWITCH-CASES

```
IF(counter>0)
    PRINT “Positive #”
ELSE IF(counter<0)
    PRINT “Negative #”
ELSE
    PRINT “Number is 0”
ENDIF
```

Control Conditions vs Loops

Conditional Statements

IF-ELSE-ENDIF

IF-ELSEIF-ELSE-ENDIF

SWITCH-CASES

```
READ day

switch(day)

     Case 1:

          PRINT “Monday”

          Break

     Case 2:

          PRINT “Tuesday”

          Break

          ...

     Default:

          PRINT “Invalid input”

          Break
```

Control Conditions vs LOOPs

LOOPs

FOR

WHILE

DO-WHILE

```
FOR(int i=0; i<5; i++)
    PRINT “In for loop”
ENDFOR
-------------------------
counter=1
WHILE(counter<5)
    PRINT “In while loop”
    counter++
ENDWHILE
```

Control Conditions vs LOOPs

LOOPs

FOR

WHILE

DO-WHILE

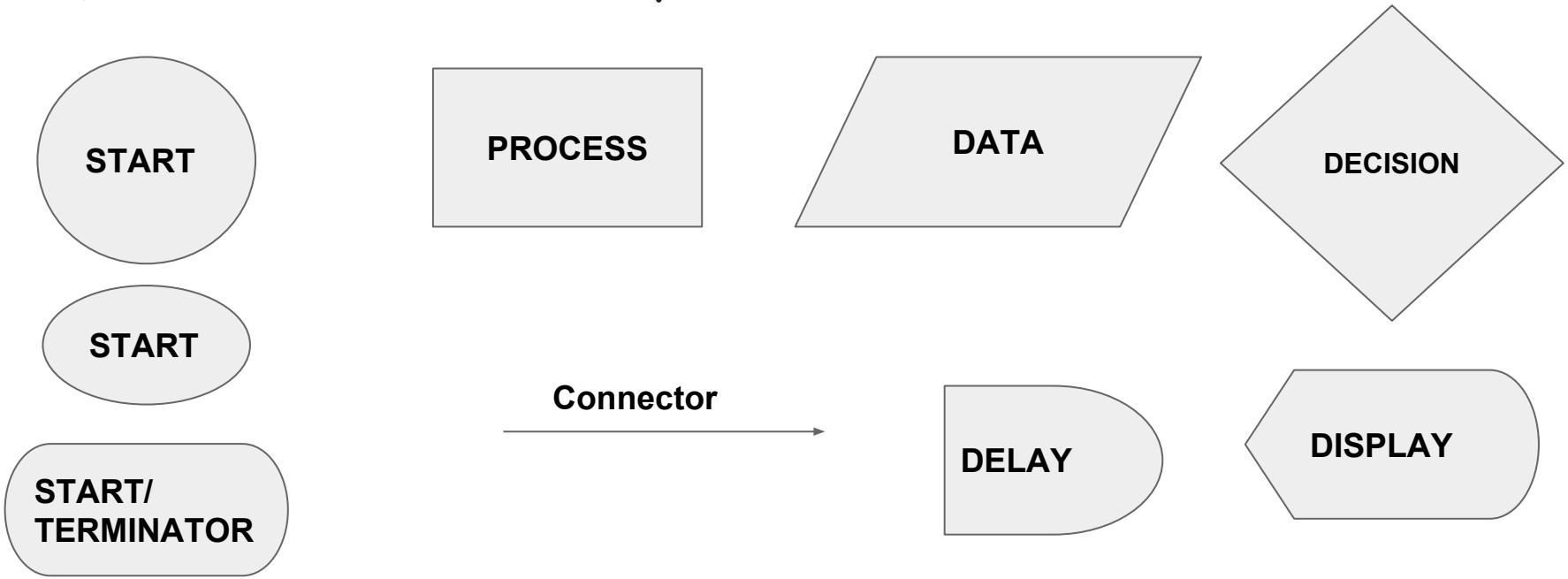
```
counter=1

DO

    PRINT “In do-while loop”

    counter++

END-DOWHILE(counter<5)
```

FLOW CHART

A type of diagram that **represents** an algorithm, workflow or process, showing the **steps** as boxes of various kinds, and their order by **connecting** them with arrows.

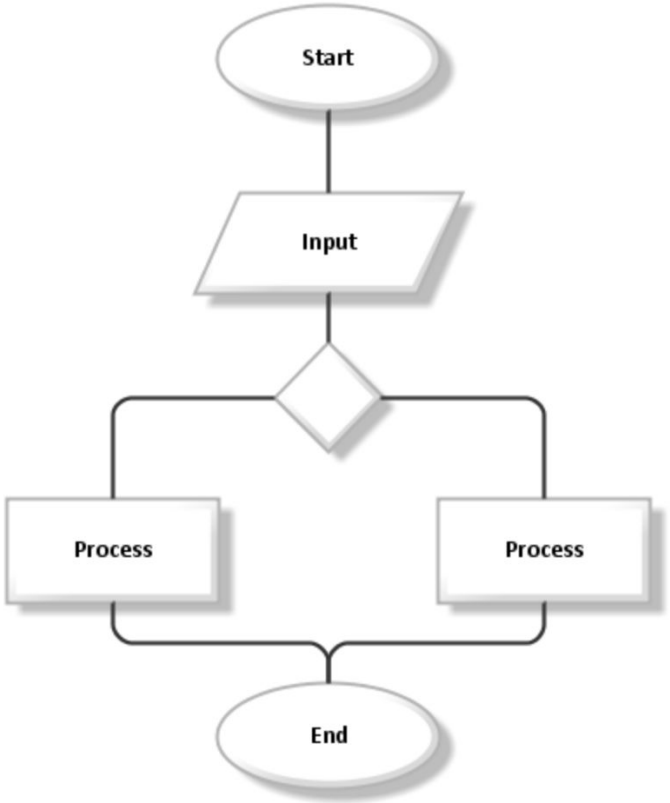
This diagrammatic representation illustrates a **solution model** to a given **problem.**

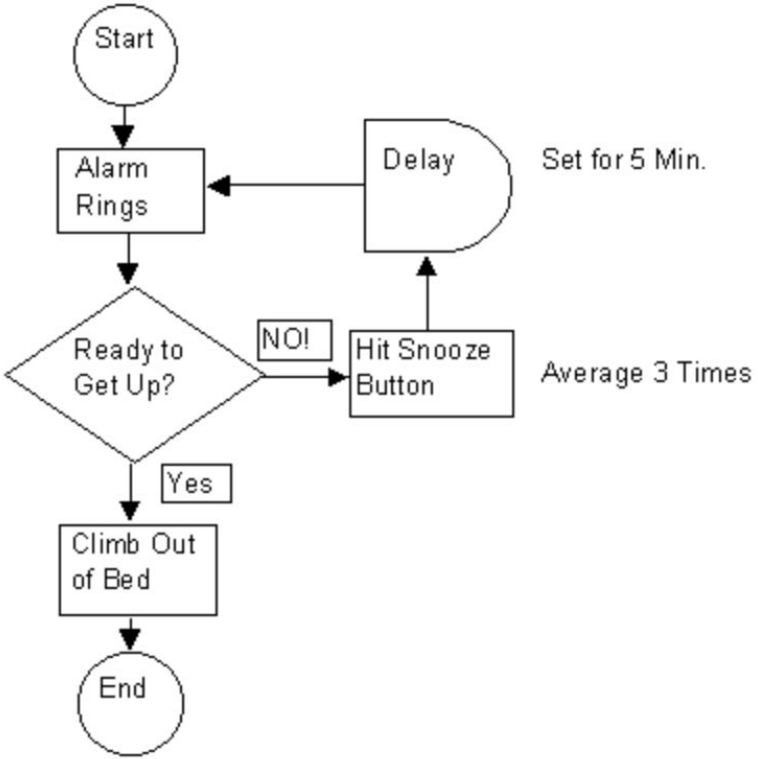
FLOW CHART- BASIC ELEMENTS



Online tool: https://www.draw.io

FLOW CHART (EXAMPLE)





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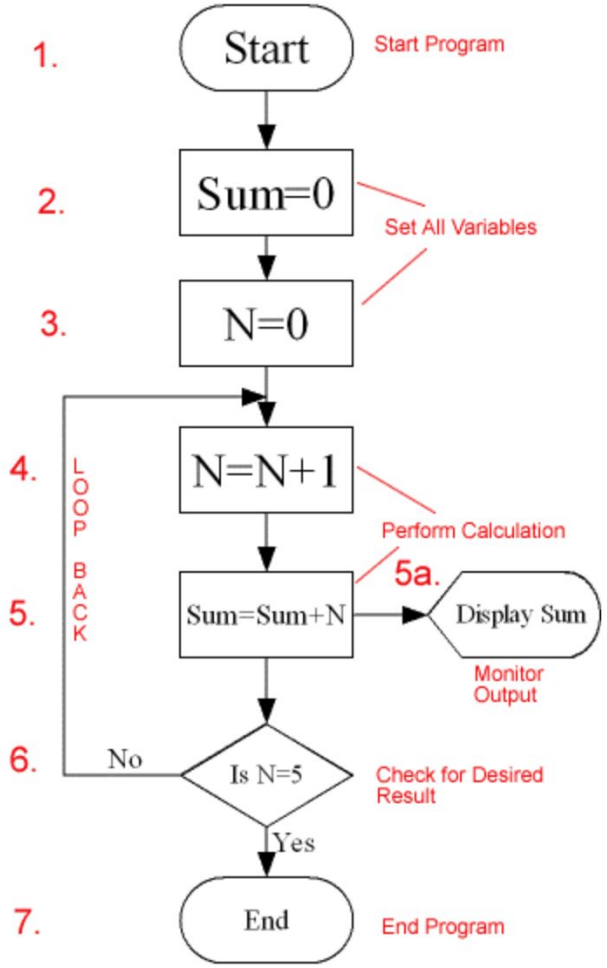
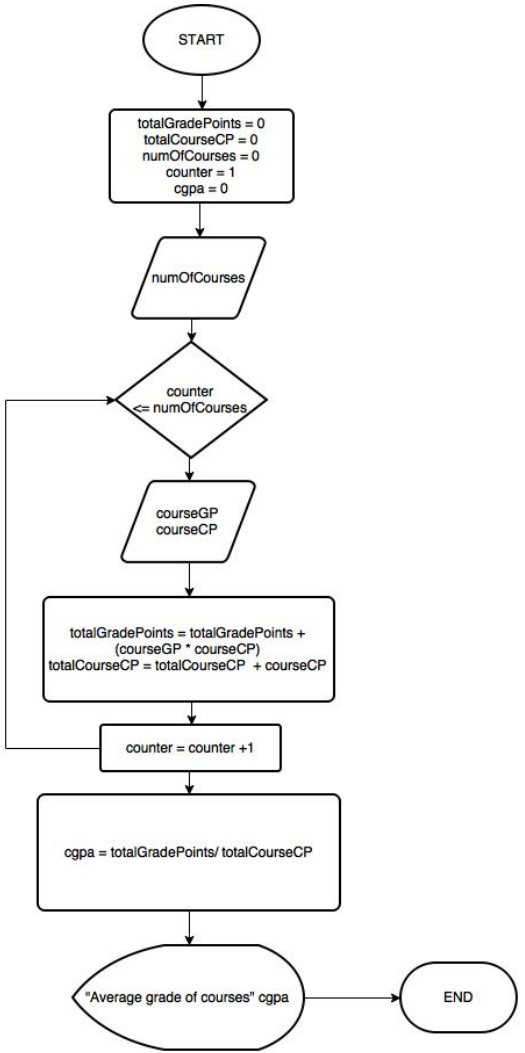


FLOW CHART (EXAMPLE)



TOOL & TECH

Integrated Development Environment (IDE)

JETBRAINS: https://www.jetbrains.com/student/

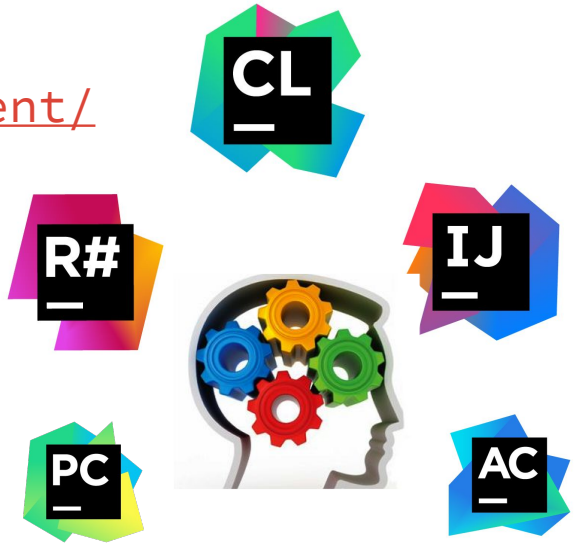
CLION - C/C++

Resharper - C#

IntelliJ IDEA - JAVA

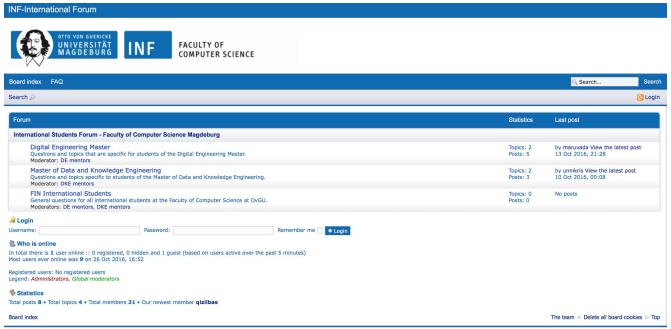
PyCharm - Python

AppCode MacOSX/iOS



HOW TO REACH US?

- FORUM for International students?
- Link: https://iif.cs.uni-magdeburg.de/index.php
- “Study group programming”
- Login with your university ID.
- Post your questions on FORUM.
- Moderators will reply.



OFFICIAL COMMUNICATION ---> FORUM ONLY

THANK YOU

Let's get started

TASK FOR TODAY?

1. Student CGPA calculation, taking courses data as input from user.
2. A simple calculator for ADD,SUB,MUL,DIV. Taking input from user.
3. **An ATM machine system, user input atm cards to take out some cash. Consider following options;**
    a. **User can check balance**
    b. **Take out some cash**
    c. **Cancel transaction**