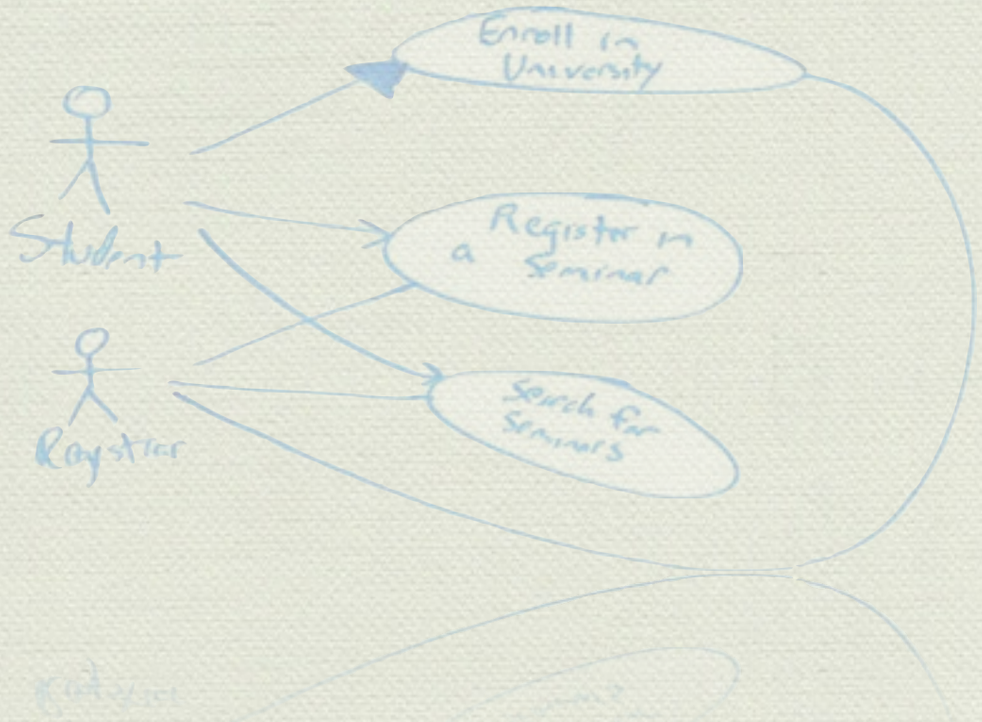
Welcome to Software Engineering Workshop



Workshop Instructor:
Marwah Alaofi

Getting to know me!

- Marwah Alaofi, a lecturer in the Department of Computer Science.

- Contact Details:
  - E-mail: maofi@taibahu.edu.sa
  - Office: 379
  - Consultation Hours:
    - Mondays, 9:30-10:30
    - Thursdays, 8:30-10:30

Today's Outlines

- Introduction to the workshop
- Introduction to the UML

Workshop's Objectives

- The workshop was proposed in response to the problems facing students working on graduation projects

- The main objective is to learn how to model your software using UML diagrams, an approach that will be required in your graduation projects.

- It is all about drawing and sketching, so all it needs is a paper and a pencil with a great curiosity about learning your new language

How it works!

- A workshop and a meeting with your supervisor in the following week.

Learning Materials

- It is always important to check the website:
  www.marwah-alaofi.com
  for workshop slides, exercise sheets, announcements, recommended readings.. etc

- **References**
  - We will use a variety of books.
  - https://www.safaribooksonline.com is a great resource for reading IT-related books.

Workshop's Protocol

- Make sure to be in the room on time (Please!)

- Mobile phones should be turned on silent mode during workshops

- Make sure to understand the materials presented to you and feel free to interrupt and ask

Assessment Overview

- Section CA and CC: 10% of your course overall mark

- Section CB: 20% of your course overall mark

- The 20 or 10 marks will be divided as follows:
  - Workshop Activities and Exercises: 50%
  - Final Project: 50%

Final Project

- Initially, you will be assigned to projects proposed by your course instructors, mainly targeting some small organizations within the campus

- More details to be announced!

Software Engineering Workshop

Workshop 1: Introduction to the UML

Marwah Alaofi

In today's workshop you'll learn ..

- What is the UML?

- The need for a unified modeling language (i.e. Why the UML is important)

- How the UML came to be

- UML diagram types

Think about it!

- For you, system/s.w development may sound simple!

- In real life, systems can be big, contains thousands of software and hardware components in which much of planning, design,.. etc are required

Think about it!

- Different people involved in the development process (analysts, designers, programmers.. etc)

- How would they communicate about the system being developed?!

  - Informal languages(e.g natural language)?! OK, let's see!

So we need to ..

- Manage complexity
- Find a standard way to communicate

What is the UML?

- UML stands for Unified Modeling Language

- The UML is a visual language for modeling and communicating about systems through the use of diagrams and supporting text.

- Provides support throughout many development phases.

To make it clear!

- Let's consider a construction trade
  - Architects design buildings.
  - Builders use the design to create buildings.
  - The blueprint is their communication language that both architects and builders must learn as part of their trade.

- UML has emerged as our software blueprint language, it gives us a common vocabulary to talk about systems.

How it came to be ..

- From simple thoughts to a language!
  - The UML is the brainchild of Grady Booch, James Rumbaugh, and Ivar Jacobson.
  - They worked in separate organizations, through the 1980s and early 1990s, each having his own methodology for object-oriented analysis and design.
  - By the mid-1990s, they began to borrow ideas from each other, so they decided to evolve their work together.
  - The Object Management Group adopted the UML1.1 specification in November 1997.
  - The current version of UML is UML 2.4.1, released in Aug 2011.

Why UML?

- Why should you consider using UML when there are so many different ways of modeling?

- It's a formal language
- It's concise
- It's comprehensive
- It's language-independent

Ways to use UML

- UML as Sketch (the most common way)
  - Help communicate some ideas and alternatives about what you're about to do or what you have done
  - The essence of sketching is *selectivity*

- UML as Blueprints
  - Blueprints are developed by a designer whose job is to build a detailed design for a programmer to code up.
  - That design should be sufficiently complete in that all design decisions are laid out, and the programmer should be able to follow it as a pretty straightforward activity that requires little thought
  - UML as blueprint is about *completeness*.

- UML as Programming Language
  - Developers draw UML diagrams that are compiled directly to executable code (code generation)

Components of the UML

- The UML is a number of graphical elements combined to form diagrams.

Use case Diagram	Interactions between your system and users or other external systems. Helpful in mapping requirements	UML 1.X
Activity Diagram	Sequential and parallel activities within your system.	UML 1.X
Class/Object Diagram	Classes, types, interfaces, and the relationships between them.	UML 1.X
State Machine Diagram	The state of an object throughout its lifetime and the events that can change that state.	UML 1.X

Components of the UML (Cont.)

Sequence Diagram	Interactions between objects where the order of the interactions is important.	UML 1.X
Communication Diagram	The ways in which objects interact and the connections that are needed to support that interaction.	Renamed from UML 1.x's collaboration diagrams
Component Diagram	Important components within your system and the interfaces they use to interact with each other.	UML1.x,but takes on a new meaning in UML 2.0
Deployment Diagram	How your system is finally deployed in a given real-world situation.	UML 1.X

Components of the UML (Cont.)

- New diagrams in UML 2.0
  - Timing Diagram
  - Interaction Overview Diagram
  - Composite Structure Diagram
  - Package Diagram

Why so many diagrams?!

- The purpose of the diagrams is to present multiple views of a system

- This set of multiple views is called a model

- It's important to note that a UML model describes what a system is supposed to do.

Where to start with the UML

- Nobody, not even the creators of the UML, understand or use all of it

- Most people use a small subset of the UML and work with that

- You have to find the subset of the UML that works for your project

Exercise Sheet!

And Group Registration

Your task for this week

- You will be assigned to a project and a supervisor
- Check the website for more details

References

- Miles, R and Hamilton, K. (2006) Learning UML 2.0. Sebastopol: O'Reilly Media, Inc.

- Fowler, M. (2004). UML distilled: a brief guide to the standard object modeling language. Addison-Wesley Professional.

- Schmuller, J. (2004). Sams Teach Yourself UML in 24 Hours, Complete Starter Kit. Sams.

- Alhir, S. (2003) *Learning UML*. Sebastopol: O'Reilly Media, Inc.