SWINBURNE UNIVERSITY OF TECHNOLOGY

Introduction to Programming

Week 1, Topic 1

Introduction and Overview

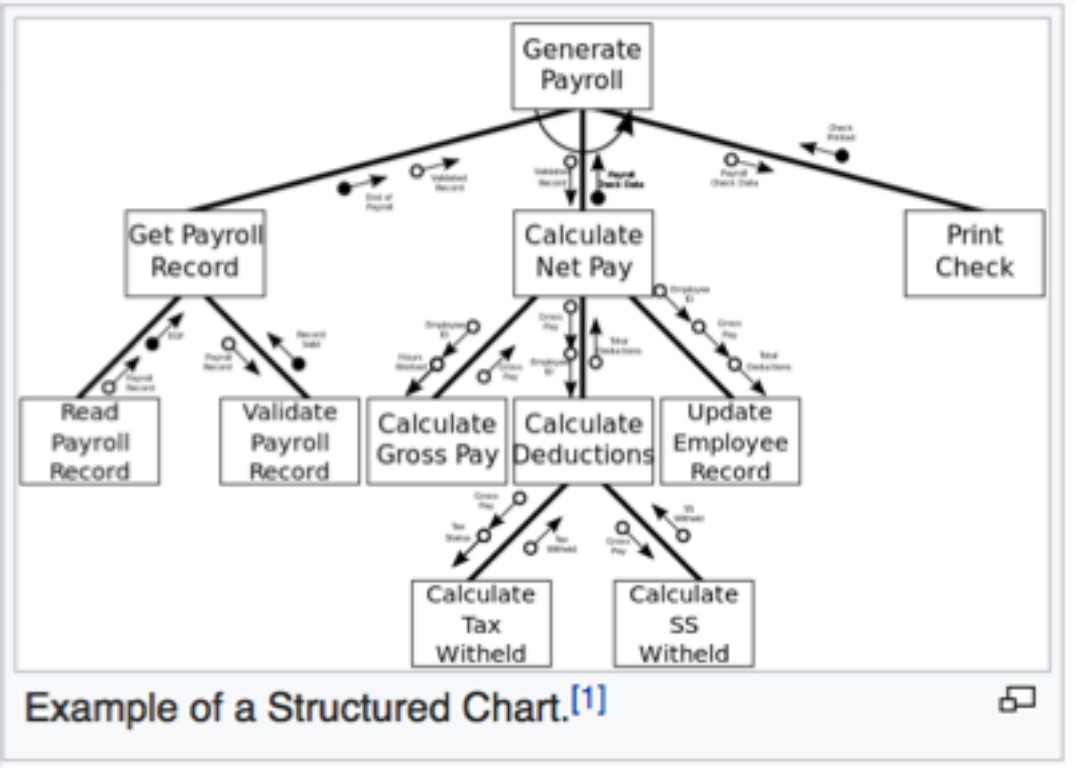
- Welcome
- What we look at today:
  - Unit Overview
  - Assessment and Submission
  - Getting Started
  - Learning Material for Week 1
  - What to do this week?

Unit Overview - Aims

- That means to teach you how to design and write code professionally in a structured/functional framework.
  - Directly Relevant languages: Go, C, Lisp, etc.
  - But indirectly also all Object Oriented languages, as the design principles largely carry across from Structured programming to Object Oriented programming (OO).
  - More on these two approaches later.

Aims – Structured Programming

To teach you how to design and write code professionally in a structured/functional framework.



Example of a Structured Chart.[1]

Source: wikipedia

Unit Overview - Aims

Directly Relevant languages:

- Go,
- C,
- Lisp,
- etc.

But indirectly also all Object Oriented languages,
as the design principles largely carry across from Structured programming to Object Oriented programming (OO).
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Assessment Tasks

- Each week there are tasks you do both in tutorials and outside tutorials.
- These tasks often build up your skills so you can put together more complex code with good design and coding practices.
- Assessment overviews are on Canvas
- Task specifications are obtained and submitted through Doubtfire.
- Lets have a quick look at both of these ….

Programming language for the unit: Ruby

Ruby is an interpreted, object oriented language which we will be using in a structured way.

A fairly popular language due to Ruby On Rails (which both Doubtfire and Canvas are written in).

It is a dynamically typed language (as opposed to statically typed) – we learn more about what that means later.

Ruby is claimed to be used by:

- AirBnB

- GitHub

- Shopify

- Hulu

- Canvas

Popularity of Ruby

Apr 2019	Apr 2018	Change	Programming Language	Ratings	Change
1	1		Java	15.035%	-0.74%
2	2		C	14.076%	+0.49%
3	3		C++	8.838%	+1.62%
4	4		Python	8.166%	+2.36%
5	6	^	Visual Basic .NET	5.795%	+0.85%
6	5	v	C#	3.515%	-1.75%
7	8	^	JavaScript	2.507%	-0.99%
8	9	^	SQL	2.272%	-0.38%
9	7	v	PHP	2.239%	-1.98%
10	14	^^	Assembly language	1.710%	+0.05%
11	18	^^	Objective-C	1.505%	+0.25%
12	17	^^	MATLAB	1.285%	-0.17%
13	10	v	Ruby	1.277%	-0.74%
14	16	^	Perl	1.269%	-0.26%
15	11	vv	Delphi/Object Pascal	1.264%	-0.70%
16	12	vv	R	1.181%	-0.63%

Source: https://www.tiobe.com/tiobe-index/

Job Demand for Ruby

United States:

1. Asp.NET 12203
2. **Rails 8710**
3. Spring MVC 3570
4. Django 2650
5. Laravel 957
6. Express.js 620

San Francisco Bay Area:

1. Python 13866
2. Java 11472
3. Javascript 7433
4. PHP 3628
5. **Ruby 3371**
6. Node 2301 (Not a language, I know)
7. C# 2070

Source:https://medium.com/@yoelblum_45935/demand-for-ruby-on-rails-is-still-huge-ea4434926c57

Salary for Ruby Programmers

Why Ruby?

That all said, we are primarily concerned with using a language that is going to help you learn, keep you motivated and get you productive quickly whilst allowing for a wide range of different projects.

We are not specifically learning Object Oriented programming at this stage, so a language that supports structured programming is desirable.

Ruby is Object Oriented but we will be using it in a mostly structured way.

Ruby runs from the DOS window or the Terminal (Mac, OSX, Linux).

Using the DOS window

- Windows: Go to Start->run type ‘cmd’, this will open the DOS window.
- Basic DOS commands are:
  - cd: change directory
  - pwd: path to current directory
  - dir: list files in directory

See the following youtube (also on Canvas):
https://www.youtube.com/watch?v=1dGwn7cPNeU

Using the bash terminal (Mac, OSX)

In Mac use Spotlight and search for ‘terminal’

Basic terminal commands:

- cd: change directory
- ls: list directory contents
- pwd: path to current directory

See the following youtube (also on Blackboard)
https://www.youtube.com/watch?v=IVquJh3DXUA

Getting Started: Installing Ruby

- **For Windows** use the Ruby-installer here (version 2.3.2)

  Select all the options in the installer when it runs.

- **for Mac-OS** build the code from source:

  Install Ruby (Install version 2.3.4.)

  Install x-code (developer tools) - this is free from the Apple App Store - download and install, then run the following command from the terminal window: 'xcode-select --install' (if you get an xcrun error - use the following command: 'sudo xcode-select -switch /')

  For Mac use this guide.

  Install Homebrew as suggested at the top of the guide, then after installing rvm (follow the rvm install instructions) type the following:

  brew install sdl2

These instructions and links are also on Canvas – see the Software section.

- Test your install: In Windows open a DOS prompt (windows->run "cmd") in Mac-OS run a terminal window.

  type: **ruby -v**

  This should tell you what version of Ruby you are running.

Getting Started: Trying Ruby online

- https://www.tutorialspoint.com/execute_ruby_online.php

- Use the API (Application Programmer Interface) documention:

  http://ruby-doc.org/core-2.4.3/

Lets take a break .....