# Foundations of Software Engineering
Coursework Description Spring 2012

## Coursework Overview

Your Task: You are tasked to find a partner and to create a game using the Scratch programming environment and python/pygame. Through this process, in your pairs you are to develop the game from its initial specification, through design, protytping, refinement, implementation, testing, to an evaluation stage. You are required to submit your completed game and a portfolio consisting of a report documenting the various stages. This document outlines specifically what is expected of you in this coursework. This coursework is worth 30% of the total marks for this module.

## Due Date: 12pm, Wed 2nd April 2012

## Coursework Synopsis:

In this coursework we aim to emulate an agile development team working for a small game development company, called NG2 Games. You are tasked to find a partner and to develop the concept for your game and to produce it in a professional manner. You are required to produce an inventive 2D game, including a ScratchScratch prototype and larger python full version and all supporting documentation in the form of a development portfolio. NG2 Games prides itself on developing inventive and imaginative games, but focuses on quick software delivery.

## Coursework Objectives:

- To perform the process of software engineering from start to completion, demonstrating evidence of ability and aptitude for each stage of the process.
- To be able to program and develop effectively in pairs.
- To demonstrate original thought and creativity in software production.
- To show use of the appropriate software engineering methodologies and diagrams.
- To comply with the attendance procedures specified for the lab sessions.
- To gain experience in working with external code and libraries
- To apply programming knowledge to a new language
- To be able to manage source code through version control systems

## Deliverables:

Submit your coursework by email to jqg@cs.nott.ac.uk as a single .zip file containing the following:

40% - Development Portfolio (3000 words approx)

10% -Well implemented prototype using Scratch

35% - Improved implementation produced using python and pygame

10% - Demo of your software (4th May in A32 @4pm)

5% - Full attendance (for the 1hr duration) at at least 6 FSE lab sessions

## Expected Content of Design Portfolio:

There are various sections required for the completion of this component of the coursework. All of these components are essential for you to obtain good marks in this section. We recommend you work on at least one section of the portfolio per week., following the plan provided in the next section:

- Game concept, requirements and specification (functional and non-functional requirements)
- Design of your game including any rules, controller behaviour, interaction design, scoring mechanism and game overview
- Evaluation of prototype and design refinements
- Implementation notes and description of the development methodology
- Evidence of testing and debugging including a write up of test cases
- Evaluation of the game through user evaluation

## Help Producing your Games

*Scratch:* there are a number of useful Scratch tutorials, see Lab sheet 1 for details.

*Python:* there are many excellent python tutorials available online and via youtube, it is worth taking the time to run through the basics. If you are having trouble understanding python please contact one of our lab demonstrators (Naisan and Rob) for additional assistance. The best tutorial is available at http://www.python.org

*Pygame:*

Again many good tutorials exist for pygame, this one is particularly useful :
http://inventwithpython.com/

Need immediate help? Post your question on the FSE subreddit forum at the following address
http://www.reddit.com/r/G51FSE/

## Advice and Considerations:

- The prototype must be produced in Scratch and the full implementation in python. No exceptions!
- If you spend all of your time developing your game and do not complete your portfolio you will not pass this coursework! The documentation and evidence you can go through a process of software engineering is the point of this coursework.

- Diagrams are a good way of expressing design ideas, there are many formal varieties but even simple block diagrams can help get your point across clearly.
- You might not want to try to make a scrolling game in Scratch - this is not usually trivial and may detract from the point.
- If you need inspiration check out some retro 2D platform games available on the web at http://www.classicgamesarcade.com/
- Pick your partner wisely - you will be awarded identical marks for this coursework!
- If you have severe problems working with your partner speak to the module convenor who may be able to help you sort out your management issues.
- If you work on this coursework consistently it should not take you more than 30 hours between you.
- Try not to leave this coursework to the last minute, we give you the facility to complete the coursework throughout the semester, make good use of the time.

## Reminder: Plagiarism between groups of pairs will not be tolerated.

## Confused? Not sure how to manage your project? Read on....

Because you guys are not used to doing project management we have broken down the tasks for you into weekly chunks. Each week describes the tasks you should have done in order to complete the coursework with the minimum amount of stress.

**We will release additional tutorial material for each lab session. If you dont want to follow this schedule, that is fine, just make sure you hand in all the correct components.**

### Lab 4 - 24/2/12

**Todays task is to make a start on your coursework. By the end of today you should have achieved the following:**

- signed the register (which you should do at every session)
- make sure you meet up with your partner - let us know if your partner is absent
- decide what game you are going to make
- write a prototype specification
- get feedback off a demonstrator on your prototype
- start developing your prototype in scratch

**Hint: use the scratch tutorial from Lab 1 if you need to refresh your Scratch skills**

### Lab 5 - 2/3/12

Todays task is to complete your Scratch prototype. By the end of today you should:

- complete your scratch prototype
- document your scratch game and take screenshots for your development portfolio
- Produce a user questionnaire to evaluate your prototype
- look over sample games produced in python using the pygame library
- make sure you have completed the basic python tutorial

Lab 6 - 9/3/12

By this point you should have your prototype completed. By the end of this session you should:

- ask another pair to do an evaluation of your prototype using last week's questionnaire
- set up and get familiar with git or your chosen version control tool and make your repository
- revise your specification in light of your prototype evaluation
- complete the pygame tutorial and test out some functionality using throw away prototypes
- produce a design for your python game including, sequence diagrams, state charts and class diagrams

Lab 7 - 16/3/12

By the end of this week you should have started your pygame python game implementation. Before you start this make sure you have looked at sample code! Your tasks for this week as are follows:

- implement the simplest version of your game possible, reproducing the functionality of your scratch prototype
- complete unit tests of your code as you implement, and keep a record of your testing for use in your design portfolio. *Hint: python has a built in unit testing tool called* unittest.
- evolve your game to include improved playability, graphics and/or multiple levels

Lab 8 - 23/3/12

No surprises as to what you have to do this week: carry on with the implementation of your python game.

Lab 9 - 30/2/12

The final tasks for the project are designed so that it is possible to complete over the easter break. Use today to either:

- complete your python game
- start writing up your Development Portfolio
- perform an evaluation of your game with at least two

Good luck, have fun!