Getting More Out of Your

Education

via the Demoscene Spirit

Jari Komppa, Assembly Summer 2009

http://iki.fi/sol/

Intro: Highschool

- Biology course on genetics.

- 1 teacher, ~100 papers to grade.

- Assignment: "Essay on something related to material covered in the course".

- One paper has the subject:

"The Ethics of the Artificial Improvement of the Human Genome"

- Good or bad?

Multiple Disciplines

- Demosceners are multidisciplinary by nature.
  - Technology and art (for example).

- Why not use this as an advantage?

Problem Definition

- Most assignments are boring.

- Most assignments take time (from whatever you'd *like* to be doing).

- Boring mandatory assignments lead to procrastination...

    – Even more time wasted!

Possible Solution

- Alter the assignment.

- Add things you know and love.

- Take a fresh view of the subject.

- But can we do that?

The Good..

- Tasks get more engaging:
  - Less procrastination.
  - (possibly) done faster.
- End product is meaningful to you.
- You learn the subject matter better.
- Possible portfolio material!

..the Bad..

- Usually means more work.
    - Although it's more what you'd like to do!

..and the Ugly.

- Several gotchas:
  - Danger of overshooting
  - Stubborn teachers
  - Copyrights

Pitfall 1: Overkill

- Don't bite more than you can handle.

- Make sure you have something to return.

- Overkill projects may also lead to..

Pitfall 2: Stubborn Teachers

- Teachers may refuse your project!
    - Too far off the assignment?
    - Impossible (for you)
    - Impossible (defies laws of physics)
    - Plagiarism?
    - Reputation helps
- Chemistry problems?

Pitfall 3: Copyrights

- Teachers may dislike publishing of answers.

- Get full copyright if you can.

- Go open source if you can't.

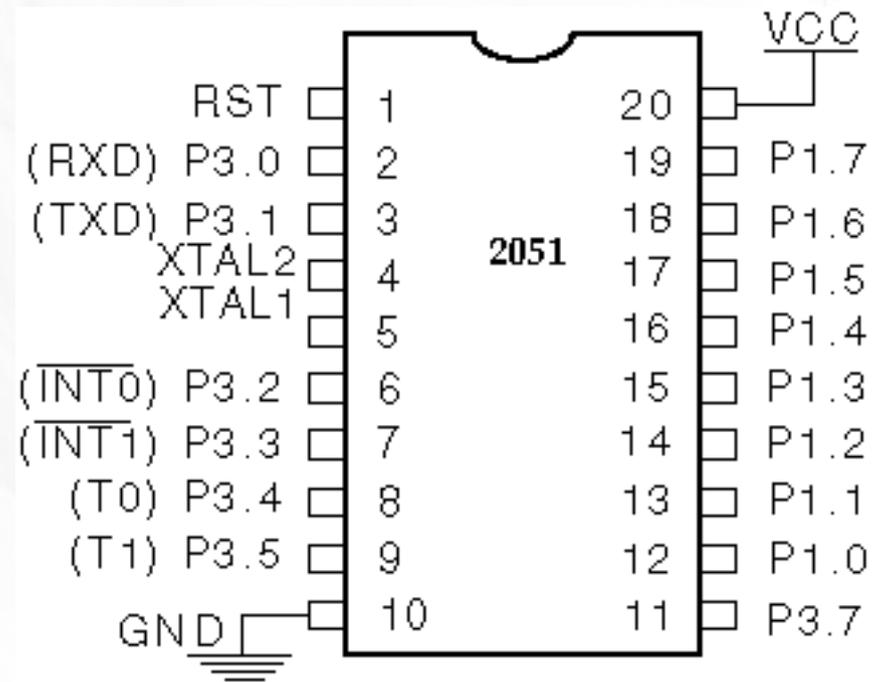- Take screenshots (etc) if that fails.

Case Studies

- Game on a 2051

- Soft synth on AVR

- GalaXQL

Case: Game on a 2051
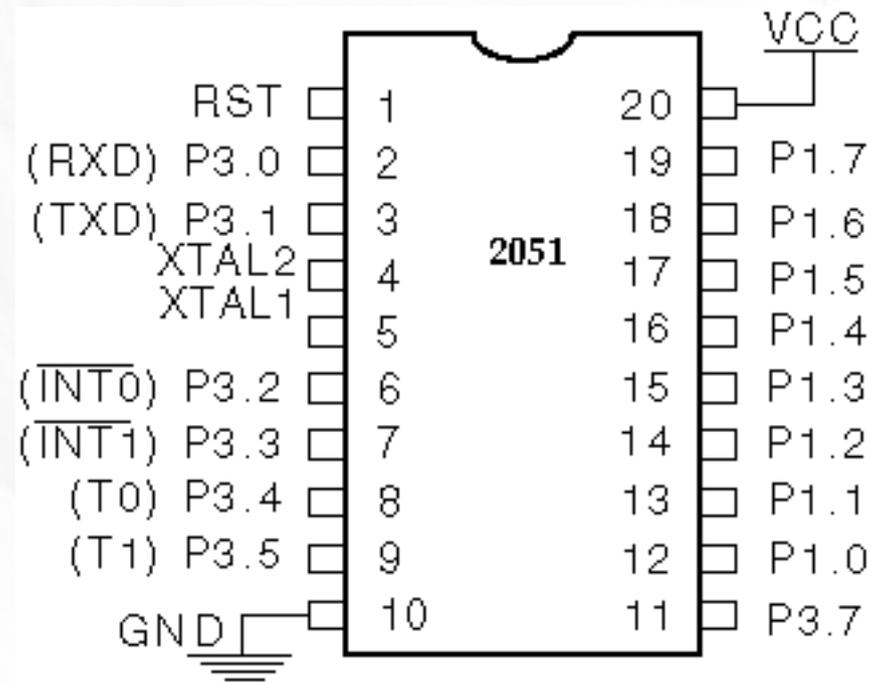
- 2051 assembler course

  Project examples:

- Traffic lights

- Sorting algorithm

- Boring...

Case: Game on a 2051

- Basically 9 free pins (P1 + P3.7)...

- 4 LEDs, 4 buttons?

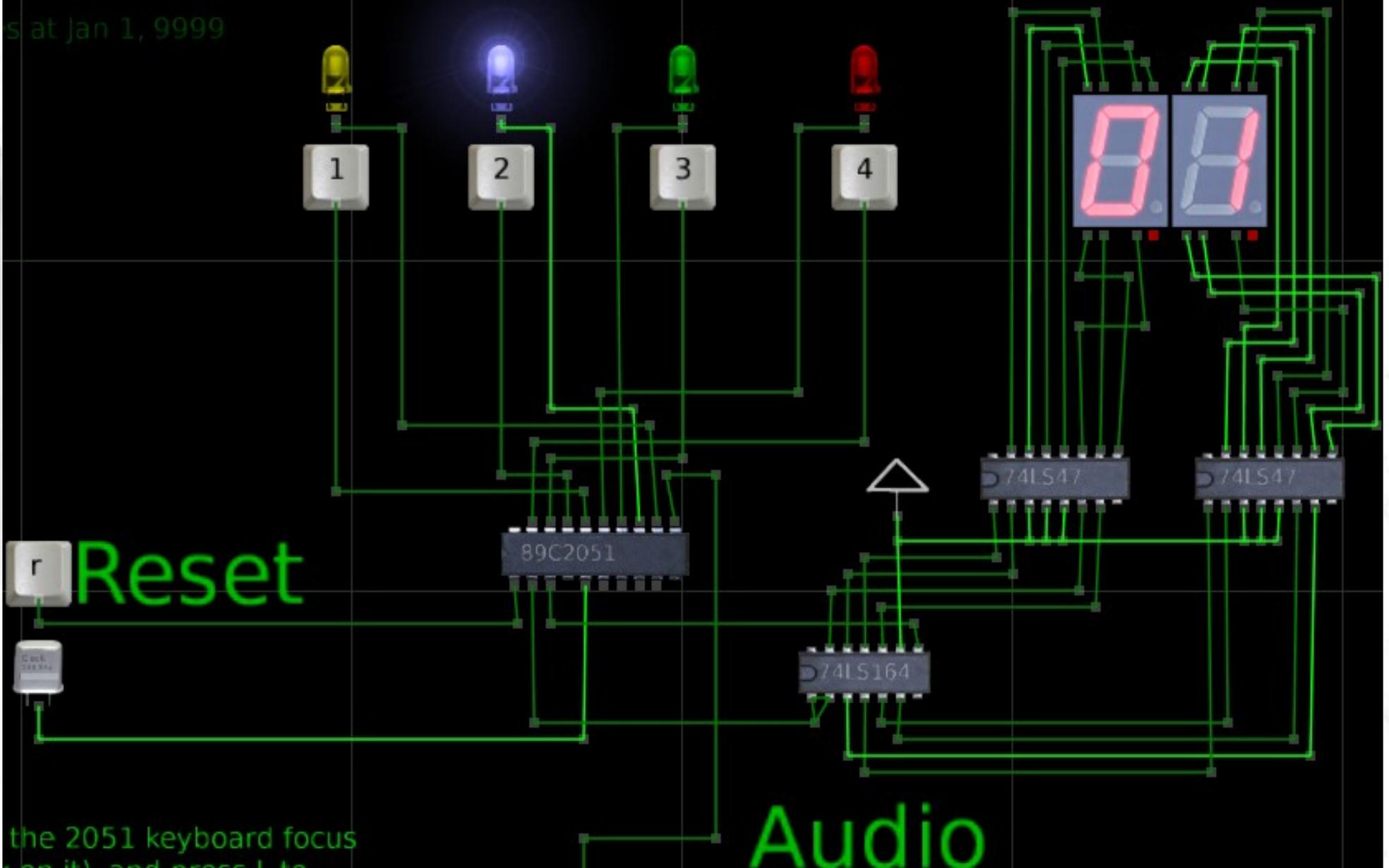- Memory game!

- Free pin used for audio

Case: Game on a 2051

- Implementation:
    - First coded as a C/C++ SDL application
    - Refactored for easy translation to assembly

Score

1116

s at Jan 1, 9999

Reset
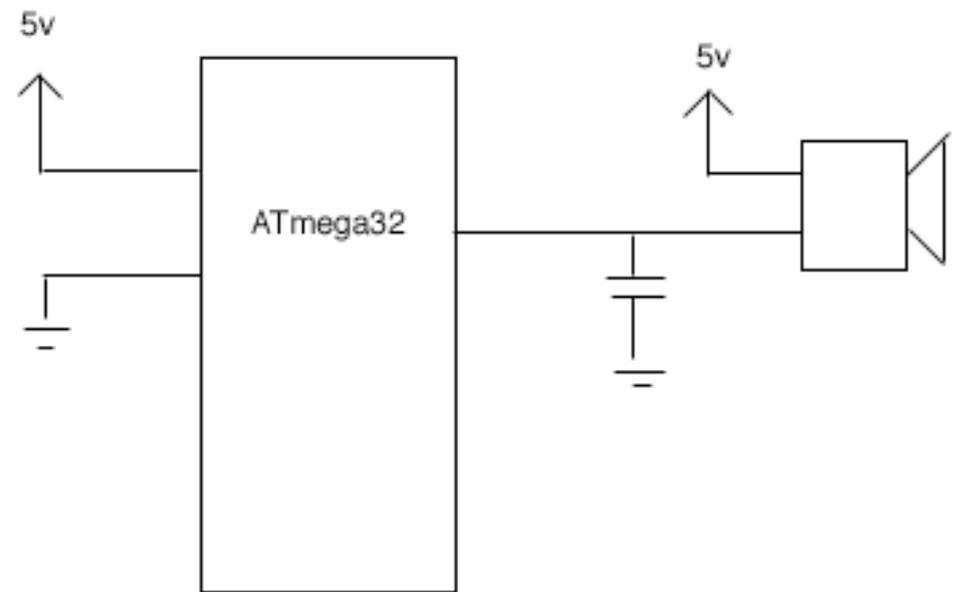
the 2051 keyboard focus
on it) and press L to

Audio

Case:Softsynth on AVR

- Project assignment: something relatively complex on a microcontroller, like operating stepper motors..

- So how about a softsynth?

Case:Softsynth on AVR

- AVR is easy and fun.

- Just a couple wires needed..

- Most of the code on desktop side.
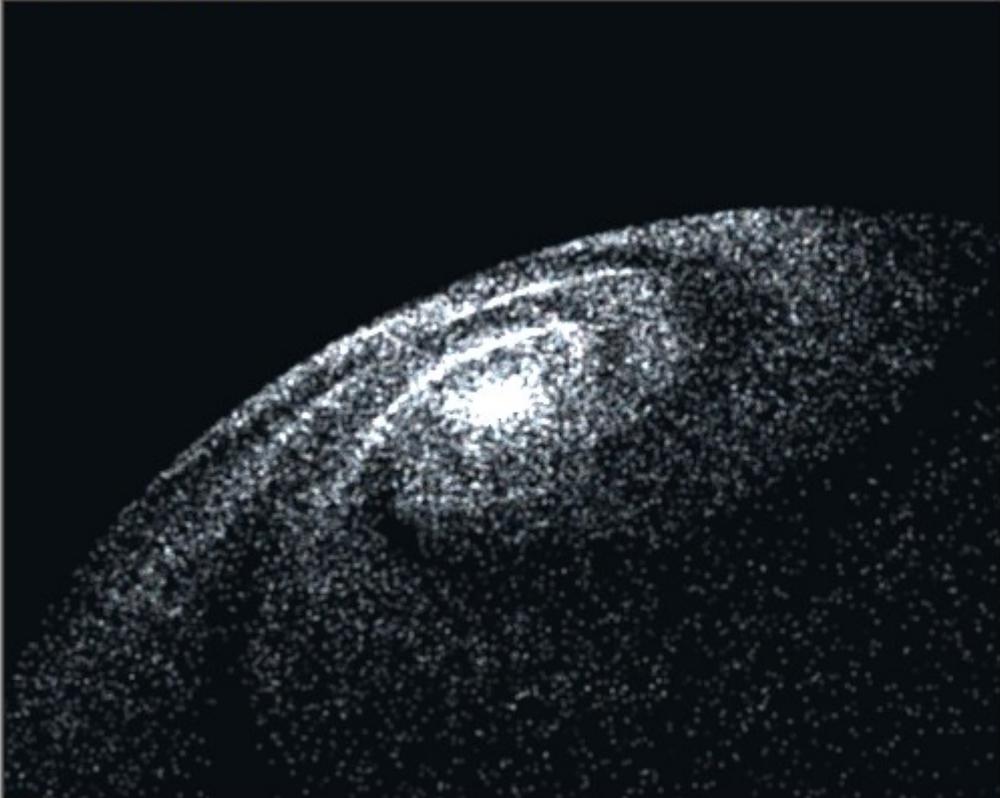
- Just a simple mixer on AVR.

Case:GalaXQL

- Course on SQL, assignment: "Define some tables, create on a SQL database, populate them"

- Boring..

Case:GalaXQL

- So how about a interactive SQL tutorial..
    - Cross platform
    - With an OpenGL-rendered galaxy
    - ..which you can blow up using SQL?

File   SQL   Graphics   Help

Guru | Query Result | Reference

1. Welcome..

Welcome!

I am Professor Alfred T. Guru [guu-ruu], your virtual guide through this SQL tutorial disguised as a galaxy manipulation application.

I'll go through the basics of SQL with you. If you wish to skip to some later chapter, you can use the selection box below my mugshot.

There are two other tabs (in addition to this one where you can find me). First one is 'Query Results', where you'll find the results for your SQL queries. The other tab, 'Reference', contains some SQL reference material that you may find handy.

```
SELECT
stars.name AS sn,
planets.name AS pn
FROM stars
LEFT OUTER JOIN planets
ON stars.starid=planets.starid
```

Load..   Save..   Run Query

Ok, I'm done..

Case:GalaXQL

- A bit of an overkill.

- On the other hand, currently in use in various universities and corporations around the world.

To Finish Off..

- Use what you know.

- Don't aim too high.

- Studying can be fun!

Q/A

Backup: English

- If you like to write..

- What the teacher wanted: about a page.

- What the teacher expected: a dozen lines.

- What the teacher got: a theater script.

Backup: Misunderstanding

- Assignment: "Define a structure that describes a CPU. Use the CPU structure. Create two CPUs and output their information."

- What was wanted: a couple of fields and couts.

- What I did: a virtual machine.

  (Led to a bigger virtual machine project later..)

Backup: Abusing Interfaces

- Assignment: Using a USB interface chip, create a device that acts as a keyboard (but is not).

- What was expected: a joystick, for example.

- What I did: data I/O using keyboard LEDs.