People

Policies

Help

做 CS编程辅导

Photo by Arno Senoner on Unsplash

Labs

**Assignment 2** 

Create a light and sound

Assessments

COMP2300/6300/ENGN2219 / Assessments / Assignment 2: Light Show

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**Specification** 

<u>Deliverables</u>

Marking Criteria

**Rules and Policies** 

<u>Outline</u>

You are going to write an AR Mrasambly program that vses the LED array on your migrabit to Help create a changing tight experience that engages a viewer. The application for your show is a demonstration of your microbit's LED array and what you can achieve with it! The Esignmental designmental transfer of the Lab 1663. Com • Lab 7: Basic Machine Code • Lab 8: Blinky • Lak S: Functions Data St uctures and St • Lab 10 & 11: Interrupts and Wrapping Up

Digital media festivals like Canberra's Enlighten Festival and Vivid

to create a *micro* light show on your micro:bit!

Sydney use huge projectors and LED arrays to create a city-sized light

(and sound) show for people to enjoy. Your task in this assignment is

If you have not completed the tasks in the above labs or do not understand the content, we strongly recommend that you first complete the labs and then start the assignment. DS.//tutorcs.com **Outline**  Deadline: 26 May 2023, 4:00 pm • Assignment template: link Specification: keep reading • Weighting: 25% • Marked out of: \_ / 100

Don't touch these!

ndent projects under the same namespace? Create a group

Project slug

Project access must be granted explicitly to each user. If this project is part of a group, access will be granted to members of the group.

comp2300-2023-checkpoint-1

Cancel

- 7:19:55:07 **Rules and Policies** 
  - this is an individual assessment task, ensure you fork your repo as private

Time Until Deadline (26 May 2023, 4:00 pm):

comp2300 > 2023 > in comp2300-2023-checkpoint-1 > Fork project Project name comp2300-2023-checkpoint-1

changes without affecting the original Project description (optional) Select your uid Visibility level ?

### The project can be accessed without any authentication Select Private Fork project you may re-use designs / files from your labs pushed to gitlab correctly

① Internal

 it is your responsibility to ensure any additional files are included in the repo and additional files should be left under the src/ directory additional files should not contain spaces in their name eg: src/example\_file.S is okay, src/example file.S is not

The project can be accessed by any logged in user

- way we won't miss extra work that you're doing • your submission must be in ARM assembly, no C or other language is permitted • <u>late submission</u> is not permitted without an <u>extension</u>
- Here's a technical specificiation for your assignment.
  - must be written in ARMv7 assembly using the <u>assignment template (link)</u> must use the LEDs to create a light show that changes over time

create a new file under <a href="src/">src/</a> and copy what you need there and modify it; this

- the light show must sufficiently demonstrate the techincal capabilities of your

up writing a worse report by reducing the conciseness of it.

To successfully complete this assignment, the following files must be submitted: 1. src/main.S containing your implementation 2. <a href="mailto:src/\_\_\_.S">src/\_\_\_.S</a> any additional files you wish to include or split your implementation

3. <a href="mailto:src/\_\_\_-lib.s">src/\_\_\_-lib.s</a> any files that contain alternative or modified versions of the

4. statement-of-originality.md containing your name, uid and a list of references

optional assets/\* containing any images you want to add in your document

appropriate for your design and what limitations it might have (25/100) Item 1 will be evaluated primarily through your program code. Items 2 and 3 will be evaluated through your report.md and the quality of the writing within.

## your level of extension beyond a basic scanning display

 your style and adherence to assembly programming standards includes things like following calling convention and good commenting for more information, check the assembly style guide

- This list is non-exhaustive and is only provided as a guide to give you an idea of what we're expecting the difficulty of the grade ranges to look like. Each point is an example of a submission, meaning that you only have to do one point from that grade range (unless otherwise specified). However, the more featured your submission
- These are just provided as a guide and as mentioned, other aspects such as the quality of the report, quality of the programming, etc. also factor in to the grade. This means that just because you have successfully implemented something in grade range X, does **not** mean that you are **guaranteed** a grade in range X.

## Everything from Credit level and *at least one* of: • Basic PWM (Pulse Width Modulation) eg: screen level brightness (all LEDs)

Moving Display, Scanned, Good use of memory

- mean that you can expect full marks.
- with the display Using multiple hardware interrupts (buttons) to control and change what is being displayed
- consult with your tutor first) **Submission**

Submission is through GitLab, the most recently pushed commit of your fork of the

assignment template before the deadline is taken to be your assignment submission.

# do NOT change the name or path of the repo, or it may get missed by our software

Forking a repository allows you to make

Select your uid

6. read the microbit tips and tricks page

3. plan your assignment and what your are going to implement 4. think of how the data structures are going to look and work 5. think of how the program is going to fit together

7. work on each part, debugging, testing, committing and pushing as you go

It will:

Group jobs by

 combine all of them into a single pdf To view the pdf, first click the ci icon on your most recent commit (as above), then click on

Job dependencies

take the code from all of your src/\_\_\_\_S files

test:ex2.dig file:ex3.dig test:ex3.dig statement-of-originality

on comp2300 c5c8e869, system ID: s\_812a7cd4a197

16 Checking out bb436031 as detached HEAD (ref is main)

Downloading artifacts for svgs (3661722)..

Downloading artifacts from coordinator... ok

Preparing the "docker" executor

17 Skipping Git submodules setup 19 Downloading artifacts

=200 OK token=Vd2fDSNJ

Report

 Generative or changing light display using the hardware Random Number Generator You modify the beating heart loop to change the size and shape of the heart when it beats based on the result from the random number generator (> 5 variations) You make the heart transition through different states (beating, broken, stopped,

brightness with the beat

If you're unsure then post privately on the forum and ask!

don't write one you will get zero for that half of the assignment.

Do I have to write a design document?

Let's use an example: a 7 second loop of a beating heart

Moving Display, Scanned, Good use of memory

- Make sure you are answering the questions in the specification and stay within the word limit. Writing a clear and concise document is a challenge, but we believe in you.
- Jobs aren't finishing! Unfortunately on the day that an assignment is due, when many students are pushing updates at once, the CI servers can't keep up. You may not see your CI jobs finish before the
  - If there's any issues with your git repository after the deadline. Please let us know (after the deadline) through a private forum post and there may be something we can do. How do I know my assessment has been submitted?
  - then your assessment has been submitted (well done!). Please don't ask us to "check", we would be just doing exactly the same thing as the above steps which you can do yourself.
    - CAPRU IARU ECX

# Fork project A fork is a copy of a project. Forking a repository allows you to make

# you may use the included library files if you wish if you want to make changes to the library files, then we suggest you instead

# should use scanning on the LEDs to enable displaying of any 5x5 image

- must include the submission of a <1000 words design document describing: what your design is (and how it meets the assignment specification) this is the code design, not what light show you're displaying how you accomplished it
- For item 1, you can consider the following to be a *part* of assessing the sophistication of your program: your use of memory for encoding your light show how easy it is to change what is displaying (a high quality submission should require little / no changes to the code to change what is being displayed)
- is, the higher the mark. In saying that though, a single high quality feature is probably better than a few low-quality ones.

This means that the program is easily changeable and controllable by modifying data

structures in memory, without, or with very little, modification of the code and then

Credit (60 - 69%)

**Distinction (70 - 79%)** 

"Good use of memory"

uploading it to the board again to view those changes.

- Generative or changing light display using the hardware Random Number Generator
- Everything from Credit level and *at least one* of: Complex PWM (Pulse Width Modulation)
  - External peripherals such as gyroscope, compass, etc, (warning: VERY DIFFICULT,

The project can be accessed without any authenticatio Select Private

The project can be accessed by any logged in user.

Project description (optional)

Visibility level ?

course forum. **Completion Checklist**  you have submitted the files <u>listed above</u> you have wrote all of your code using good practice you have saved, committed and pushed your assembly files to gitlab you have filled out, committed, and pushed your statement-of-originality.md you have filled out, committed, and pushed your report.md you have checked the <u>report pdf artifact on gitlab</u> to ensure it is correct you have checked the gitlab ci tests and they are passing Report pdf Artifact

Your repo will be packaged into a report pdf for marking purposes. As such it is important

that you see what the result of the pdf job is and make sure the output makes sense.

take your name and uid from the statement-of-originality.md

• take references from the statement-of-originality.md

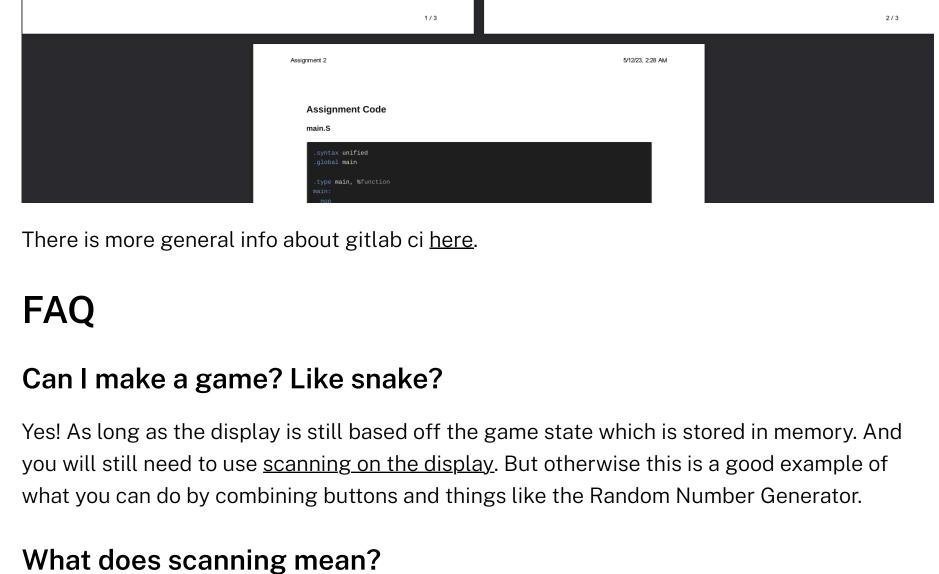
### filecheck test (!) test:ex1.dig file:ex1.dig file:ex2.dig

Pipelines Using Docker executor with image charlepm/pandoc-latex-libertine:0.3.0 ... Editor These artifacts are the latest. They will Jobs Pulling docker image charlepm/pandoc-latex-libertine:0.3.0 ... Using docker image sha256:ec65f85988c0b08fb3c0dfcfc6f63fa098949119c8284cd491fbeffef8f7425c for charlepm/p not be deleted (even if expired) unti Schedules andoc-latex-libertine:0.3.0 with digest charlepm/pandoc-latex-libertine@sha256:f977de0e213850d01878b07639a newer artifacts are available 325a7976d85d6e0d752f5cdbdb383dea13eb0 ... Security & Compliance Keep \_\_\_\_ Download Running on runner-c5c8e869-project-184393-concurrent-0 via courses-runner.. Packages and registries 00:02 Commit bb436031 Fetching changes with git depth set to 1000 Fix namespace including slashes

14 Initialized empty Git repository in /builds/comp2300/2023/comp2300-2023-checkpoint-1/.git/

This will download a zip file containing your pdf. Which should look something like this.

5/12/23, 2:28 AM



What does sufficiently demonstrate the techincal capabilities of your

This means that your light show, what is actually being displayed on the LEDs, doesn't need

to be long or visually complex. But, it needs to be able to demonstrate what you have

However, if you're aiming for a grade of Distinction or High Distinction then the

Below are some examples of implementation quality and how this loop could be used to

This would already be sufficient, assuming that you have encoded the display in

map, controlling a game, exploring a menu (think gameboy menu here).

extension will need to be paired with the show in some form of significant way. This

means that if you were adding a button for example, then doing something with state

where the buttons have some kind of impact would be required, eg: scrolling around a

### irregular) based on the result from the random number generator Complex PWM (Pulse Width Modulation) You modify the beating heart loop to also include a change in brightness for the LEDs when the heart beats, so that the outer LEDs are dimmer, but grow in

any individual assessment task).

2. the time is before the deadline

demonstrate the capability:

memory

There is a <u>lab exercise</u> for this.

implementation mean?

implemented.

My program doesn't work, can I email you for help? Sorry, you won't get help over email or Teams. We provide a course forum which is the only way we are able to help.

Forum posts related to your assignment submission **must** be "private to instructors" (as for

- deadline. You will just have to manually check that your files have been submitted correctly. The best way to avoid this issue is to start early and finish early 😇
  - lf: 1. the files in your fork of the assessment are correct (i.e., the files you intend to submit) when checking on the gitlab website
- The Australian National University acknowledges, celebrates and pays our respects to the Ngunnawal and Ngambri people of the Canberra region and to all First Nations Australians on whose traditional lands we meet and work, and whose cultures are among the oldest continuing

assessment has

been submitted?

- **Specification** Your program:
  - <u>implementation</u> must never stop (it can repeat or loop) must work when the microbit is powered over USB but not connected to a computer (that is, it works after you upload it and plug into a USB charger) • should use **memory** (data structures) to create a changing and easily modifiable light show
  - why your design choices were appropriate for the task Note that we say < 1000 words. If you feel you have addressed all of what has been asked of you in less words, please don't feel the need to hit 1000 words. You will end

functions found in <a href="lib/\_\_\_.S">lib/\_\_\_.S</a> (optional)

5. report.md containing your <1000 word design document

For more information on items 2 and 3, read the design document guide.

Your assignment will be evaluated on the following criteria:

for **any** work that is not your own

across (optional)

**Marking Criteria** 

- **Deliverables** 
  - 1. Sophistication of your implementation in ARM-v7 assembly language (50/100) 2. Sophistication of your design and how it meets the assignment specification (25/100) 3. Sophistication of analysis and evaluation of why your implementation is correct and
- **Ideas For Implementation**
- Pass (50 59%) Moving Display, Non-scanned, Good use of memory Moving Display, Scanned, Poor use of memory
- Using the timer interrupt(s) as an integral part of your display **High Distinction (80% - 100%)** An HD is a mark of 80+, not 100. Just because you do something in this range, doesn't

• eg: per-LED brightness control that can be programmed with memory and change

Don't touch these!

comp2300-2023-checkpoint-1

Cancel

- **Getting Started** 1. read this assessment page completely 2. fork and clone the assessment template ensure you fork your project as private
  - 8. make a mistake or get stuck, then ask your tutor in your lab or a good question on the
- the pdf job. Needs Jobs 9 Failed Jobs 7

Stage

the Download button.

₩ Monito

X Snippets

Assignment 2

take your report from report.md

comp2300 > 2023 > comp2300-2023-checkpoint-1 > Jobs > #3661723 C comp2300-2023-checkp... pdf Project information opassed Job pdf triggered 3 minutes ago by Brent Schuetze Repository Finished: 4 minutes ago Q ? = + + Search job log ໃ Merge requests Timeout: 1h (from project) Running with gitlab-runner 15.9.0 (c20f0bec) Runner: #38 (c5c8e869) comp2300

Then, you'll be taken to the job page, where you should see a "Job Artifacts" section, click on

capture

(✓) svgs

host=gitlab.cecs.anu.edu.au id=3661722 responseStatus

[1] Example Author. 2023. example code video. Retrieved from <a href="https://example.com/video">https://example.com/video</a>

References

render

**( ✓ )** pdf

Tags: comp2300

! Pipeline #545174 for main ြ

5/12/23, 2:28 AM

 $\rightarrow$   $\bigcirc$  pdf

pdf - passed

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- How do I write a design document? Have a look at the design document page for advice.

Yes! 50% of the marks for this assignment are evaluated through the design document. If you

- It's [5 minutes, 60 minutes, 12 hours] before the deadline and my CI
- cultures in human history. Contact ANU | Copyright | Disclaimer | Privacy | Freedom of Information +61 2 6125 5111 | The Australian National University, Canberra

**Acknowledgement of Country** 

Australian

University

**National** 

TEQSA Provider ID: PRV12002 (Australian University) | CRICOS Provider Code: 00120C | ABN: 52 234 063 906