Report Writing

• Components
• Writing Style
• Dos & Don’ts

Components

• Title Page (-)
• Executive Summary (1)
• Introduction (1)
• High-Level Design (1)
• Low-Level Design (6)
• Evaluation (1)
• Appendix (unlimited)
• Total = 10 pages

• 6 pages / 6 students = 1 page / student
• You only have 1 page to describe your work
Title Page

- Name of Project
- Name of Team
- Names of Authors

- No figure titles (only decoration)
- Good place to sneak in a photo of project

Executive Summary

- Short description of everything contained in the report.
  - RCG
  - How you solved the problem
  - How well your device performs
  - Include Important values (e.g. refresh rate)

- Most difficult piece to write.
- Last thing you should write.
- See website for example.
Introduction

- Description of problem.
- Requirements
  - Must ...
- Constraints
  - Must not ...
- Goals
  - Min / max
  - Optimization criteria
- Example: buying a car
  - Must be a convertible
  - Must be in stock
  - Must not cost > $20,000
  - Must not be red
  - Minimum mileage.
  - Minimum cost.
  - Maximum fuel efficiency.

High Level Design

- Block Diagram
  - Descriptive titles
  - No details
  - No spaghetti (crossing lines)
- Functional
- Physical

[Diagram of high level design with block diagrams for analog-to-binary conversion, sensor wait, trigger record, LEDs, Altera, DAC, sensor, mechanism, motor, and driver CCT]
Low-Level Design (Body)

- 6 pages
- 12 point type
- 1 ½ spacing

- Everything needed to understand the work
  - Figures
  - Graphs
  - Equations

- No
  - Raw data
  - Lengthy derivations

Evaluation

- Description of tests performed
- Results of tests
  - Numeric
  - No vague statements (works perfectly)
- Requirements, Constraints & Goals
  - Which are satisfied?
  - Which are not?
  - Numeric evaluation of Goals.

- Be impartial
Conclusion

• Repeat
  – What was done.
  – What was accomplished.
• If RCGs not met, why not?
• Is there something that should have been done differently?
  – Technical, not personal
• What is yet to be done?

Appendix

• Body
  – Everything you need to UNDERSTAND the work
    • Graphs
    • Flowchart or Pseudo-code

• Appendix
  – Extra stuff you need to REPRODUCE the work
  – Raw data
  – Assembly / C / VHDL code
  – Detailed drawings
Writing Style - Narrative

- **1st Person**
  - The author
- **2nd Person**
  - The reader
- **3rd Person**
  - Everybody else

Narrative

- **1st Person**
  - I connected an 8-bit counter to my 1MHz oscillator to reduce the frequency to 4KHz.
- **2nd Person**
  - You connected an 8-bit counter to your 1MHz oscillator to reduce the frequency to 4KHz.
2nd Person Narrative

• Instruction manuals
  – To remove the valve covers, first remove the spark plug wires, then unscrew the cover bolts in a star pattern and tap the side of the valve cover with a rubber mallet to break it free from the gasket.

• Implies:
  – You remove the spark plug wires.
  – You unscrew the bolts.
  – You tap the valve cover.

Best Choice

• 3rd Person
  – An 8-bit counter is connected to the 1MHz oscillator to reduce the frequency to 4KHz.
Tense

• Past tense
  – An 8-bit counter was connected to the 1MHz oscillator to reduce the frequency to 4KHz.

• Present tense
  – An 8-bit counter is connected to the 1MHz oscillator to reduce the frequency to 4KHz.

• Future tense
  – An 8-bit counter will be connected to the 1MHz oscillator to reduce the frequency to 4KHz.

Efficiency

• After many group discussions where we compared a large number of possible alternatives, we determined that the best solution involved a servo-motor and cam shaft.

• Of the 3 alternatives shown in Appendix A2, a cam mounted to a servo-motor was the only option that met the mass constraint without violating …
THE vs. A

• “The” refers to a particular instance.

• The voltage regulator used in the power supply is an LM7805.

A power supply is designed which must provide 5V DC and a maximum of 1 Amp. It consists of an oscillator circuit, a full bridge rectifier and a voltage regulator. The voltage regulator used in the power supply is an LM7805.

Figures

In the figure of a planetary gear system shown below, clockwise rotation of the sun gear in the centre of the figure, causes counter-clockwise rotation of the three planet gears which lie between the sun gear and the co-centric outer orbit gear. As the planet gears rotate, they travel along the orbit gear and rotate the y-shaped carrier that they are connected to, in a clockwise direction but at a reduced rotation rate.
In Figure 1, clockwise rotation of sun gear (a) causes counterclockwise rotation of planet gears (b) which travel along orbit gear (c) to rotate carrier (d) in a clockwise direction, at a reduced rotation rate.

The sun gear rotates about central axis (e) while the planet gears rotate about carrier axis (f).

Figure 1: Planetary Gear System

Figures

- Descriptive figure title with number
- Always referred to in the text by figure number
- Appear below text that refers to them
- Annotations
  - Unique name
  - Appear ONLY ONCE in text
The most common form of Ohm’s Law (1) which relates a relative voltage (V) to a current (I) by an impedance (Z), is ambiguous. In (2), V is replaced by node voltages $V_1$ and $V_2$ to resolve the ambiguity.

\[
V = IZ \quad (1)
\]
\[
V_1 - V_2 = IZ \quad (2)
\]
Appendix

• Numbered
• Always referred to in the text
  – The “Pinch” function (see assembly code in the Appendix) is responsible for actuating the servo motor.

BAD
  – The “Pinch” function (see Appendix A.2) is responsible for actuating the servo motor.

GOOD

Dos & Don’ts

• Do
  – Professional language
  – Simple words & phrases
  – Correct spelling & grammar

• Don’t
  – Slang
  – Creative writing
  – Story telling
Dos & Don’ts

• Do
  – 3rd Person
  – Present Tense
  – Figures, Equations & Appendices
    • Labelled & numbered
    • Referred to in text
    • Appearing after reference in text
    • Annotated
    • Variables & annotations described ONCE in text