

# Computer Science I A

## Suggested Process for Stage A - Analysis

1. Choose a **problem** (be very **specific**)
2. Choose the **intended-end-user(s)** (at least one real person) – this should not be "everybody" or "me myself"
3. **Describe** the problem, including **current/previous solutions**.  
What happens now? How is it done? What is unsatisfactory?
4. **Collect** sample **documents** and **data** from the current solution
5. Outline **intended improvements** of a new system
6. Create an **initial system design** (simple) for the new system
7. Create a **prototype** – either **functional** (a program) or **mocked-up** (interfaces only).
8. *optional*: Use a functional prototype to investigate the **feasibility** of programming the new system (solve some tricky problems)
9. Use the prototype(s) to **discuss** the new system with the user
10. Collect the user's **reactions** and **suggestions** (written down)
11. **Document** the most significant **user stories** which identify the major **tasks** to be performed with the new system
12. **Improve** the **system design** and **interfaces** to meet the **user's suggestions** and fulfill the needs in the **user stories**
13. Write a **clear** and **complete** set of **goals** – extracted from the user stories and revised design – specifying what it **WILL do**
14. **Clarify limitations** of the intended system – what it **WON'T do**
15. Review **goals** and **limitations** with the intended user and revise (if necessary) until the user is satisfied

# Checklist for Stage A

Use this check-list to make sure you have fulfilled at least the **minimum** requirements for full credit. You will probably do some extra things, so that the document is well organized and readable.

## **A1 - Analysis (2-3 pages)**

- 1 State the problem (1 sentence)
- 2 Describe the problem (1 paragraph about **problem**, not solution)
- 3 Evidence of collecting information (sample data, talk to user)
- 4 Use a systematic method (include sample input, output, and processing)

## **A2 - Criteria for Success (1-2 pages, 5-10 goals)**

- 1 State some objectives (a few statements)
- 2 Describes most objective (several sentences)
- 3 Relates all objectives to analysis (a user-story or paragraph for each)
- 4 Outline limits (include potential problems and limitations of system)

## **A3 - Prototype (several IO sample pages, including sample data)**

- 1 Initial design (diagrams)
- 2 Prototype (several pages outlining user interface)
- 3 Prototype corresponds to initial design (at least 1 page for each design element)
- 4 Document user feedback (question and answer notes from an interview)

An example and more details are available at:

<http://ibcomp.fis.edu/Projects/newproj/DocsAF.pdf>

Below are the detailed criteria (from the IBO guide).

## Criterion A1: Analysing the problem

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The documentation should be completed first and contain a thorough discussion of the problem that is being solved. This should concentrate on the **problem** and the goals that are being set, not on the method of solution. A good analysis includes information such as sample data, information and requests from the **identified end-user**, and possibly some background of how the problem has been solved in the past. A **systematic method** is one that takes into account what input and output will occur and what calculations and processes will be necessary to obtain the desired output.

<b>0</b> : The student has not reached a standard described by any of the descriptors given below. For example, the student has simply described the programmed solution.
<b>1</b> : The student only <b>states</b> the problem to be solved <b>or shows</b> some evidence that relevant information has been collected.
<b>2</b> : The student <b>describes</b> the problem to be solved.
<b>3</b> : The student describes the problem <b>and provides evidence</b> that information relating to the problem has been collected.
<b>4</b> : The student provides evidence that a <b>systematic method</b> has been used in the analysis of the problem.

This section of the program dossier would typically be two to three pages in length. It should include a brief statement of the problem as seen by the end-user. A discussion of the problem from the end-user's point of view should take place, including the user's needs, required input and required output. For example, evidence could be sample data, interviews and so on, and could be placed in an appendix.

## Criterion A2: Criteria for success

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This section of the program dossier will clearly state the objectives/goals of the solution to the problem. The expected behaviour of the solution should be clearly described and the limits under which it can operate outlined.

<b>0</b> : The student has not reached a standard described by any of the descriptors given below.
<b>1</b> : The student <b>states some</b> objectives of the solution.
<b>2</b> : The student <b>describes most of</b> the objectives of the solution.
<b>3</b> : The student <b>relates all of</b> the objectives of the solution to the analysis of the problem.
<b>4</b> : The student relates all of the objectives of the solution to the analysis of the problem, and <b>outlines</b> the limits under which the solution will operate.

This section of the program dossier would typically be one to two pages in length. Objectives should include minimum performance and usability. These criteria for success will be referred to in subsequent criteria, for example criterion C2 (Usability), C4 (Success of program); D2 (Evaluating solutions) and D3 (Including user documentation).

The limits under which the solution will operate will vary. Some examples are:

- Time taken to return a research result from a data file
- The response of the program to invalid and extreme data input
- Limitations on the volume of data stored in the program
- Usability of user input screen
- The proper response of the program to user input.

## Criterion A3: Prototype solution

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The prototype solution **must** be preceded by an initial design for some of the main objectives that were determined to be the criteria for success. A prototype of the solution should be created. A prototype is: “The construction of a simple version of the solution that is used as part of the design process to demonstrate how the system will work.”

<b>0</b> : The student has not reached a standard described by any of the descriptors given below.
<b>1</b> : The student includes only an <b>initial design</b> .
<b>2</b> : The student includes an initial design <b>and a prototype</b> , but they do not correspond.
<b>3</b> : The student includes an initial design and a prototype that <b>corresponds</b> .
<b>4</b> : The student includes an initial design and a complete prototype that corresponds to it <b>and documents user feedback</b> in evaluating the prototype.

The prototype need not be functional, it could be constructed using a number of tools such as: Visual Basic, PowerPoint, Mac Paint, Corel Draw for a simple Java program. The intent is to show the user how the system is expected to operate, what inputs are required and what outputs will be produced. A number of screenshots will be required for the user to be able to evaluate the solution properly. The prototype, at its simplest, could be a series of clear, computer-generated drawings, a hierarchical outline of features in text mode, or a series of screenshots.

Documentation of user feedback could be, for example, a report of the user’s comments on the prototype