

2017 Project log

A-level Computer Science (7517)
Computing Practical Project (7517/C)

These are the centre awarded marks.

The moderated marks are discussed in the slideshow PDF

Please attach a copy of this form securely to the front your candidate's work.

Centre number

XX

Centre name

XX

Candidate number

XX

Candidate's full name

Snakes and Ladders

Section one - the project

To be completed by the candidate and returned to the teacher for approval before the project is started

Project title Snakes and Ladders App

Project type problem

Outline description

Creating an app using python/kivy which will enable multiple people to play snakes and ladders supporting saving and loading of games.

To be completed by the teacher:

From the given description the project is at a standard required for A-level

Yes

Section two – project assessment

To be completed by the teacher

Analysis			
Level	Criteria	Mark	Comments/evidence
3	<p>Fully or nearly fully scoped analysis of a real problem, presented in a way that a third party can understand. Requirements fully documented in a set of measurable and appropriate specific objectives, covering all required functionality of the solution or areas of investigation. Requirements arrived at by considering, through dialogue, the needs of the intended users of the system, or recipients of the outcomes for investigative projects. Problem sufficiently well modelled to be of use in subsequent stages.</p>	7-9	<p>Problem is presented well and has been researched well although there could be more evidence to support some of the claims made as to how popular things are and perhaps could have evidenced discussions with target market.</p> <p>Objectives are clear and SMART, where they were ambiguous they have been broken down into stages to accomplish an overall objective which will meet the functionality of the game.</p> <p>Flowchart models the problem well.</p>
2	<p>Well scoped analysis (but with some omissions that are not serious enough to undermine later design) of a real problem. Most, but not all, requirements documented in a set of, in the main, measurable and appropriate specific objectives that cover most of the required functionality of a solution or areas of investigation. Requirements arrived at, in the main, by considering, through dialogue, the needs of the intended users of the system, or recipients of the outcomes for investigative projects. Problem sufficiently well modelled to be of use in subsequent stages.</p>	4-6	<p>The main criticism is that is limited dialogue about the end users, while they are identified and those things which will appeal to them are highlighted, there is a lack of evidence as to how these conclusions were arrived at. When discussing with the student the discussions were verbal so they happened, but it would be better to see evidence of these.</p> <p>Analysis feedback is referred to in evaluation evidence and is included at the end of the document.</p>
1	<p>Partly scoped analysis of a problem. Requirements partly documented in a set of specific objectives, not all of which are measurable or appropriate for developing a solution. The required functionality or areas of investigation are only partly addressed. Some attempt to consider, through dialogue, the needs of the intended users of the system, or recipients of the outcomes for investigative projects. Problem partly modelled and of some use in subsequent stages.</p>	1-3	
	No evidence presented	0	Mark awarded:6

Documented design			
Level	Criteria	Mark	Comments/evidence
4	Fully or nearly fully articulated design for a real problem, that describes how all or almost all of the key aspects of the solution/investigation are to be structured/are structured.	10-12	The problem is very well designed, it is clear to see the colours and styles needed and it is well explained the reasons for this and anyone would easily follow this. The core algorithms for the solution are designed including how the difficulty levels will work, how objects are created and placed on the grid and how players will move around the grid.
3	Adequately articulated design for a real problem that describes how most of the key aspects of the solution/investigation are to be structured/are structured.	7-9	The one thing which is missing from the design is what exactly will happen when someone lands on a sabotage space. How will this be implemented?
2	Partially articulated design for a real problem that describes how some aspects of the solution/investigation are to be structured/are structured.	4-6	Data-flow diagram is clear and the structure of the files used for data storage are clear and well explained. Level 4 – It is clear how the solution will work and how it will be achieved, I am just left with a few questions about the exact specifics
1	Inadequate articulation of the design of the solution so that it is difficult to obtain a picture of how the solution/investigation is to be structured/is structured without resorting to looking directly at the programmed solution.	1-3	
	No evidence presented	0	Mark awarded:10

Technical solution – completeness			
Level	Criteria	Mark	Comments/evidence
3	A system that meets almost all of the requirements of a solution/an investigation (ignoring any requirements that go beyond the demands of A-level).	11-15	All of the objectives have been met and they all work to fundamentally producing the game of snakes and ladders. The interactions work and the use of buttons and screens ensure that it would be playable easily without the need for instruction by the target audience
2	A system that achieves many of the requirements but not all. The marks at the top end of the band are for systems that include some of the most important requirements.	6-10	
1	A system that tackles some aspects of the problem or investigation.	1-5	
	No evidence presented	0	Mark awarded:15

NOTES:

Completeness is not only about how well a solution meets the objectives set by the student but also what an expected technical solution might perform for this particular project.

Technical solution – techniques used			
Level	Criteria	Mark	Comments/evidence
3	The techniques used are appropriate and demonstrate a level of technical skill equivalent to those listed in Group A in Table 1 . Program(s) demonstrate(s) that the skill required for this level has been applied sufficiently to demonstrate proficiency.	19-27	There are some elements of user defined objects although because of the nature of Kivy these are extensions and sub-classes or core built classes. The program is comfortably in band 2 because it uses simple to more complex OOP and it also reads and writes to files as a data store for the application.
2	The techniques used are appropriate and demonstrate a level of technical skill equivalent to those listed in Group B in Table 1 . Program(s) demonstrate(s) that the skill required for this level has been applied sufficiently to demonstrate proficiency.	10-18	Objects are programmatically generated which is how the difficulty levels are achieved allowing for more snake and ladders as required. Programming style is good with excellent features. By it's nature it is predominantly offensively programmed as the user has minimal opportunity for input, however there is some defensive programming but it is missing a catch all exception which could cause a program crash.
1	The techniques used demonstrate a level of technical skill equivalent to those listed in Group C in Table 1 . Program(s) demonstrate(s) that the skill required for this level has been applied sufficiently to demonstrate proficiency.	1-9	It is well commented and self-documenting with excellent use of variables. Band 2 - Good
	No evidence presented	0	Mark awarded:17

NOTES:

The mark to be awarded, within the level, should be decided upon using these factors:

- (1) The extent to which the criteria for the level have been achieved
- (2) The quality of the coding style that the student has demonstrated
- (3) The effectiveness of the solution.

It would be beneficial for these to also be referred to in the comments/evidence section.

Table 1 referred to is on pages 95-96 of the specification (version 1.4 December 2016)

Continue on a separate sheet if necessary

Testing			
Level	Criteria	Mark	Comments/evidence
4	Clear evidence, in the form of carefully selected representative samples, that thorough testing has been carried out. This demonstrates the robustness of the complete or nearly complete solution/thoroughness of investigation and that the requirements of the solution/investigation have been achieved.	7-8	Extensive testing has been carried out and clearly demonstrates the project is working fully. Screenshots are carefully labelled and where errors were found, they were corrected and retested, allowing for confidence that the testing is robust.
3	Extensive testing has been carried out, but the evidence presented in the form of representative samples does not make clear that all of the core requirements of the solution/investigation have been achieved. This may be due to some key aspects not being tested or because the evidence is not always presented clearly.	5-6	All of the requirements are tested and proven to be working Level 4
2	Evidence in the form of representative samples of moderately extensive testing, but falling short of demonstrating that the requirements of the solution/investigation have been achieved and the solution is robust/investigation thorough. The evidence presented is explained.	3-4	
1	A small number of tests have been carried out, which demonstrate that some parts of the solution work/some outcomes of the investigation are achieved. The evidence presented may not be entirely clear.	1-2	
	No evidence presented	0	Mark awarded:8

Evaluation			
Level	Criteria	Mark	Comments/evidence
4	Full consideration given to how well the outcome meets all of its requirements. How the outcome could be improved if the problem was revisited is discussed and given detailed consideration. Independent feedback obtained of a useful and realistic nature, evaluated and discussed in a meaningful way.	4	Band 2 – The user feedback upon completion of the project which has been obtained is not really evidenced and is not really representative as it encompasses only 3 people and is not really explained or expanded on. Most of the feedback evaluation is discussing the analysis feedback. Objectives evaluated well and meaningful conclusions and improvements are drawn from their own evaluation of the project.
3	Full or nearly full consideration given to how well the outcome meets all of its requirements. How the outcome could be improved if the problem was revisited is discussed but consideration given is limited. Independent feedback obtained of a useful and realistic nature but is not evaluated and discussed in a meaningful way, if at all.	3	
2	The outcome is discussed but not all aspects are fully addressed either by omission or because some of the requirements have not been met and those requirements not met have been ignored in the evaluation. No independent feedback obtained or if obtained is not sufficiently useful or realistic to be evaluated in a meaningful way even if attempted.	2	
1	Some of the outcomes are assessed but only in a superficial way. No independent feedback obtained or if obtained is so basic as to be not worthy of evaluation.	1	
	No evidence presented	0	

Total mark 58 /75

Concluding comments:

Project is well built but not quite showing the technical skills of a top programmer, The student had to do a lot of work and independent research into how to use Kivy and how to get the best out of it. Overall the project works and plays smoothly and is very intuitive. I would recommend Video testing in future however we were not aware that was an option when the testing was being done.

Signed:

Date:

This project was moderated at (and then further reduced as deemed not at A-level standard):

Analysis 4 → 1

Design 5 → 1

Completeness 8

Technical Skills 14

Testing 6 → 2

Evaluation 2 → 1

So the project ended up with a moderated mark of 27

The project was also deemed not to be of A-level standard and therefore the marks were reduced as per the specification.

Please see the slides PDF for details about this or contact AQA

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Please attach a copy of this form securely to the front your candidate's work.

Centre number

XX

Centre name

XX

Candidate number

XX

Candidate's full name

Project Icarus

Section one - the project

To be completed by the candidate and returned to the teacher for approval before the project is started

Project title Project Icarus – 2 way comms with high altitude balloon

Project type problem investigation

Outline description

A project that successfully builds a system for communication between a high altitude balloon and a computer on the ground. Tested twice with flights.

To be completed by the teacher:

From the given description the project is at a standard required for A-level

Yes/No

Section two – project assessment

To be completed by the teacher

Analysis			
Level	Criteria	Mark	Comments/evidence
3	<p>Fully or nearly fully scoped analysis of a real problem, presented in a way that a third party can understand.</p> <p>Requirements fully documented in a set of measurable and appropriate specific objectives, covering all required functionality of the solution or areas of investigation.</p> <p>Requirements arrived at by considering, through dialogue, the needs of the intended users of the system, or recipients of the outcomes for investigative projects.</p> <p>Problem sufficiently well modelled to be of use in subsequent stages.</p>	7-9	<p>The problem is fully investigated.</p> <p>Clear research into hardware (pages 7-11)</p> <p>Dialogue with appropriate people (page 6,14-16). The dialogue is at a level that is helpful for the students and also guides them in thinking about the solutions (reflected upon well).</p> <p>Objectives: These are broken down into a list of SMART objectives that are suitable for this project. They give a feeling to the complexity of the whole project and also demonstrate that the steps needed to solve the problem have been carefully thought about.</p>
2	<p>Well scoped analysis (but with some omissions that are not serious enough to undermine later design) of a real problem. Most, but not all, requirements documented in a set of, in the main, measurable and appropriate specific objectives that cover most of the required functionality of a solution or areas of investigation.</p> <p>Requirements arrived at, in the main, by considering, through dialogue, the needs of the intended users of the system, or recipients of the outcomes for investigative projects.</p> <p>Problem sufficiently well modelled to be of use in subsequent stages.</p>	4-6	<p>Modelling: This is the only part that is perhaps lacking from this analysis. There is an initial DFD (page 5). The written work clearly demonstrates that the student has broken this problem down into the stages required (also evident in objectives).</p> <p>Awarded 8 marks as the analysis is very well detailed but just missing the 'well modelled to be of use'.</p>
1	<p>Partly scoped analysis of a problem.</p> <p>Requirements partly documented in a set of specific objectives, not all of which are measurable or appropriate for developing a solution. The required functionality or areas of investigation are only partly addressed.</p> <p>Some attempt to consider, through dialogue, the needs of the intended users of the system, or recipients of the outcomes for investigative projects.</p> <p>Problem partly modelled and of some use in subsequent stages.</p>	1-3	
	No evidence presented	0	Mark awarded: 8

Documented design			
Level	Criteria	Mark	Comments/evidence
4	Fully or nearly fully articulated design for a real problem, that describes how all or almost all of the key aspects of the solution/investigation are to be structured/are structured.	10-12	Overview: Pages 24/25/26 – clear that the student has considered all 3 main systems and then broken these down into core components. Also whole system overview on page 48. Details as to working (initial design): Pages 27-31 again show the analysis going further with consideration as to how bits will work for this project.
3	Adequately articulated design for a real problem that describes how most of the key aspects of the solution/investigation are to be structured/are structured.	7-9	UI design: Present with details about workings underneath each sketch. Student provides examples of data to be used by the system to help understand the workings (page 38 for example)
2	Partially articulated design for a real problem that describes how some aspects of the solution/investigation are to be structured/are structured.	4-6	Algorithms: The pseudo-code is written in a clear style and supported with flow-charts and descriptions in places (pages 42-47)
1	Inadequate articulation of the design of the solution so that it is difficult to obtain a picture of how the solution/investigation is to be structured/is structured without resorting to looking directly at the programmed solution.	1-3	The student has clearly thought about the design of their project and this is evident in the detail provided in this section. This is a 'full or nearly full design'.
	No evidence presented	0	Mark awarded: 12

Technical solution – completeness			
Level	Criteria	Mark	Comments/evidence
3	A system that meets almost all of the requirements of a solution/an investigation (ignoring any requirements that go beyond the demands of A-level).	11-15	As can be seen from the testing of the system the student has clearly met the requirements of the problem initially introduced.
2	A system that achieves many of the requirements but not all. The marks at the top end of the band are for systems that include some of the most important requirements.	6-10	
1	A system that tackles some aspects of the problem or investigation.	1-5	
	No evidence presented	0	
			Mark awarded: 15

NOTES:

Completeness is not only about how well a solution meets the objectives set by the student but also what an expected technical solution might perform for this particular project.

Technical solution – techniques used			
Level	Criteria	Mark	Comments/evidence
3	The techniques used are appropriate and demonstrate a level of technical skill equivalent to those listed in Group A in Table 1 . Program(s) demonstrate(s) that the skill required for this level has been applied sufficiently to demonstrate proficiency.	19-27	As a whole this project has been complex for the student to complete. They have built a system that runs on a raspberry pi that involves: Image manipulation, threads, radio communications, maths for bitwise manipulation A webserver: Simple SQL (parameterised), use of JSON for data,
2	The techniques used are appropriate and demonstrate a level of technical skill equivalent to those listed in Group B in Table 1 . Program(s) demonstrate(s) that the skill required for this level has been applied sufficiently to demonstrate proficiency.	10-18	The system as a whole relies on a good networking protocol having been developed and tested. The code is commented well in places (but could have a few more). The code has evidence of defensive programming. Good use of OOP. Whilst there is no one mega-complex algorithm I am marking this as a 'whole project' and considering that the skills demonstrated are of a high proficiency and suitable for Group A.
1	The techniques used demonstrate a level of technical skill equivalent to those listed in Group C in Table 1 . Program(s) demonstrate(s) that the skill required for this level has been applied sufficiently to demonstrate proficiency.	1-9	
	No evidence presented	0	Mark awarded: 26

NOTES:

The mark to be awarded, within the level, should be decided upon using these factors:

- (1) The extent to which the criteria for the level have been achieved
- (2) The quality of the coding style that the student has demonstrated
- (3) The effectiveness of the solution.

It would be beneficial for these to also be referred to in the comments/evidence section.

Table 1 referred to is on pages 95-96 of the specification (version 1.4 December 2016)

Continue on a separate sheet if necessary

Testing			
Level	Criteria	Mark	Comments/evidence
4	Clear evidence, in the form of carefully selected representative samples, that thorough testing has been carried out. This demonstrates the robustness of the complete or nearly complete solution/thoroughness of investigation and that the requirements of the solution/investigation have been achieved.	7-8	The testing clearly demonstrates that the student has covered the core requirements and also thought about the system as a whole (by doing 2 test flights). There is also evidence that the testing has identified some issues that have then been corrected as part of the project.
3	Extensive testing has been carried out, but the evidence presented in the form of representative samples does not make clear that all of the core requirements of the solution/investigation have been achieved. This may be due to some key aspects not being tested or because the evidence is not always presented clearly.	5-6	The layout of the images and text to support the test-plan is a bit confusing but the evidence is present.
2	Evidence in the form of representative samples of moderately extensive testing, but falling short of demonstrating that the requirements of the solution/investigation have been achieved and the solution is robust/investigation thorough. The evidence presented is explained.	3-4	
1	A small number of tests have been carried out, which demonstrate that some parts of the solution work/some outcomes of the investigation are achieved. The evidence presented may not be entirely clear.	1-2	
	No evidence presented	0	Mark awarded:8

Evaluation			
Level	Criteria	Mark	Comments/evidence
4	Full consideration given to how well the outcome meets all of its requirements. How the outcome could be improved if the problem was revisited is discussed and given detailed consideration. Independent feedback obtained of a useful and realistic nature, evaluated and discussed in a meaningful way.	4	Student has clearly evaluated against their objectives in a critical way. They have identified what could be 'issues' with some objectives and demonstrated the ability to think of solutions and/or adjustments. The client feedback is authentic and has pointers that are useful for the student if they wished to develop the solution further.
3	Full or nearly full consideration given to how well the outcome meets all of its requirements. How the outcome could be improved if the problem was revisited is discussed but consideration given is limited. Independent feedback obtained of a useful and realistic nature but is not evaluated and discussed in a meaningful way, if at all.	3	Students considers well potential extensions and improvements.
2	The outcome is discussed but not all aspects are fully addressed either by omission or because some of the requirements have not been met and those requirements not met have been ignored in the evaluation. No independent feedback obtained or if obtained is not sufficiently useful or realistic to be evaluated in a meaningful way even if attempted.	2	
1	Some of the outcomes are assessed but only in a superficial way. No independent feedback obtained or if obtained is so basic as to be not worthy of evaluation.	1	
	No evidence presented	0	Mark awarded:4

Total mark 73 /75

Concluding comments:

Signed:

Date:

At moderation the centre marks were agreed with for this project.

These are the centre awarded marks.

The moderated marks are discussed in the slideshow PDF

A-star path following - Graph Tutor

Analysis Section	Level	3	Mark	9	
Comments		Moderated at 7			
<p>The analysis section is clear. Client identified, the problem area and problem described. A layperson could understand that the client is _____ and that the program being developed is a program to demonstrate breadth-first, depth-first and A* algorithms. Clear to see that the program will be based on a grid will include a target, seeker, open and closed nodes.</p> <p>Research has been identified and explained. Can see involvement of client and independent research. _____ has found suitable algorithms to base his program upon, he has well explained them showing clearly understanding.</p> <p>Set of user needs present which have been expanded upon in the objectives section. Objectives split into sensible sections from system start up to reset. Objectives are appropriate to the program he will develop. The objectives are measurable, appropriate and single purpose. There is no ambiguity.</p> <p>He has specified the analysis data dictionary, inheritance and class diagrams. A competent designer could take I _____'s analysis section and design an appropriate system.</p> <p>There is clear evidence of interaction with client in the analysis stage. A write up on the interview has been included and there is evidence of email and verbal conversations.</p> <p>The analysis section is fully scoped:</p> <ol style="list-style-type: none"> 1. Clear to see the problem has been researched thoroughly 2. The problem is clearly defined and understandable to a lay person 3. Nothing has been omitted relevant to subsequent stages 4. Objectives are clear, unambiguous and identify the scope of the project 5. Modelling is present to inform the design stage and would allow a competent designer to design a program for the problem <p>I cannot see any reason why full marks cannot be awarded.</p>					
Design Section		Level	4	Mark	12
Comments		Moderated at 9			
<p>_____s design section is clear. The overall system design clearly and unambiguously gives a good overview of the program to be built as a whole. The hierarchy diagram does not necessarily show each module to be created but is very useful at showing the overall logic of the program and how it is intended to work. This would be very useful to a competent programmer to follow. The user interface design is very clear and very useful. It shows the interface throughout the different stages of the program and gives a very good overview of what occurs during each stage. It would be very clear to a programmer what the stages are, what needs to be programmed and what the interface will look like.</p> <p>There is a clear data dictionary for the form itself using good standard notation for the naming of objects. A programmer would know the exact type of object to be used, what to name it and its purpose as good descriptions are present for each control.</p>					

The two classes have been very clearly defined. A programmer would know what to name each class, private properties and public methods etc. Good descriptions are present for each to aid a programmer's understanding.

has ensured detailed algorithms are present for methods other than simple getters and setters. Local variables are identified and explained. An overview is present for each that explains in plain English what each method will do. There is then a detailed algorithm that could be turned into program code with very little thought from a competent programmer.

Overall, the design is fully articulated and describes how all or almost all of the key aspects of the solution are to be structured. I can see no reason why full marks cannot be awarded.

Technical Solution **Moderated at 10**

Completeness of Solution	Level	3	Mark	15
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The system is complete. All objectives given in the analysis of the system have been met. Objectives were A level standard. Evaluation and client feedback show objectives were met. Testing shows objectives were met. Code shows objectives met. **Moderated at 24**

Techniques Used	Level	3	Mark	24
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Average performance: Group A equivalent algorithms and/or model programmed well; majority of excellent coding style characteristics; an effective solution.

Technical Skills	Coding style
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Model	Algorithms	
<p>The model is group A. Queues, trees and lists have been used appropriately.</p> <p>Complex user-defined use of object-orientated present including composition, interfaces etc</p>	<p>Tree traversal</p> <p>Queue operation</p> <p>Recursive</p> <p>List operations</p>	<p>All basic and good present</p> <p>From excellent modules have appropriate interfaces. Code interacts through interface only on the whole. Modules do one thing only on the whole. Exceptions handled well and programming defensive on the whole</p>

has provided his program listings in the appendix section. All listing are appropriately annotated and self-documenting. A third party could discern the quality and purpose of the coding from the comments given and the style of coding used. Overview is given in the system maintenance section. That section includes easy to discern objects/classes. Code itself is well commented. The comments do explain sections of code that could be deemed to be difficult to understand. The design section expands on these where necessary and can be taken in conjunction with the maintenance section and the code itself. **Moderated at 5**

Testing	Level	3	Mark	5
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has tested the system including typical, erroneous and extreme data. Some of the evidence is via screenprints the rest is in the video. has ensured timings are present to make browsing the results easier. Testjng could have been clearer eg tests 13 and 14 says he is testing to ensure validating the grid size between 0 and 11. This does not make sense as written. His next set of testing says grid size has to be between 1 and 11. Underneath the tables of tests he also describes how a grid of 1 is not sensible and he has changed the code but he has not gone on to prove that this is the case. It is clear to see objectives are met. **Moderated at 3**

Evaluation	Level	4	Mark	4
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has given the original objectives in the evaluation and has evaluated whether or not they have been met. He has done this using his own opinion and has also incorporated the feedback from his client. This is how he has determined the overall success with each objective. He has considered improvements and they are sensible and, on the whole, well thought out. Client verification is present in the appendix section.

I can see no reason why full marks cannot be awarded.