# 2020/21 candidate record form, production log and assessment record

## Level 3 Extended Project (7993)

Please attach the form to your candidate’s work and keep it at the centre or send it to the moderator as required. The declarations should be completed as indicated.

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| --- | --- | --- |
| **Centre number** |  | **Centre name** |
| 25284 |  | Wigston College |
|  |  |  |

|  |  |  |
| --- | --- | --- |
| **Candidate number** |  | **Candidate’s full name** |
| 8132 |  | Vimal Vinod |
|  |  |  |

|  |
| --- |
| Work submitted for assessment **must** be the candidate’s own. If candidates copy work, allow candidates to copy from them, or cheat in any other way, they may be disqualified. |

**Candidate declaration**

Have you received help/information from anyone **other than** subject teacher(s) to produce this work?

☒ No ☐ Yes *(give details below or on a separate sheet if necessary).*

|  |
| --- |
| Click here to enter text. |

Please list below any books, leaflets or other materials (for example DVDs, software packages, internet information) used to complete this work **no**t acknowledged in the work itself. Presenting materials copied from other sources **without acknowledgement** is regarded as deliberate deception.

|  |
| --- |
| Click here to enter text. |

We may use examples of candidate’s work for standardisation or training purposes.  Please see our privacy notice for more information on how we use assessment data and on your rights under data privacy legislation.

I have read and understood the above. I confirm I produced the attached work without assistance other than that which is acceptable under the scheme of assessment.

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| --- | --- | --- |
| Vimal Vinod | Date | 07 November 2020 |
|  |  |

**Supervisor declaration**

I confirm the candidate’s work was conducted under the conditions laid out by the specification. I have authenticated the candidate’s work and am satisfied, (to the best of my knowledge) that the work produced is solely that of the candidate.

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| --- | --- | --- |
| Supervisor signature. | Date | Click here to enter a date. |
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Submission checklist

**To be completed by the supervisor**

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| --- | --- |
| Extended Project **working** title | Click here to enter text. |
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| --- | --- |
| Extended Project **final** title | Click here to enter text. |
|  |  |

Form of project

|  |  |  |  |
| --- | --- | --- | --- |
| ☐ | Either | written report | |
| ☐ | Or | Click here to enter text. | and accompanying written report |
|  |  |  |  |

Is this project part of a group project?

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| --- | --- | --- |
| ☐ | No |  |
| ☐ | Yes | If ‘Yes’, give brief details Click here to enter text. |

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| --- |
| **Please note** that failure to complete or submit a compulsory element may result in a mark of zero being awarded. |

|  |  |  |
| --- | --- | --- |
| Select/tick | Items that **must** be included | Notes |
| ☐ | 1. A signed and completed *Candidate record form, production log and assessment record* | This document. All pages must be completed. |
| ☐ | 1. Research based written report | If the project product is an artefact or a production, an accompanying research based written report is also required. |
| ☐ | 1. Evidence of the project product | Eg photographs of artefact, investigation or production; a piece of creative writing (artefact); research based written report. |
| ☐ | 1. Evidence of a presentation within the production log | Presentation on the project process. Where the project product is itself a presentation (for a specified audience), a presentation on the project process must also be delivered to a non-specialist audience |

The taught skills element

**To be completed by the supervisor**

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| **Outline details of taught skills**  Record here details of relevant skills taught in a class/group and details of relevant skills taught individually to this candidate as described in the specification. Continue on a separate sheet if necessary.  Click here to enter text. |

Record of marks

**To be completed by the supervisor**

Marks must be awarded in accordance with the instructions and criteria in the specification.

Summary information to show how the marks have been awarded should be given in the spaces below in addition to comments in other pages of this document and any supporting information in the form of annotations on the candidate’s work.

|  |  |  |  |
| --- | --- | --- | --- |
| Skill area | Maximum mark | Mark awarded | Supervisor’s supporting statement |
| 1. Manage | 10 | Click. | Click here to enter text. |
| 1. Use resources | 10 | Click. | Click here to enter text. |
| 1. Develop and realise | 20 | Click. | Click here to enter text. |
| 1. Review | 10 | Click. | Click here to enter text. |
| Total mark | 50 | Click. |  |

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| **Supervisor’s concluding comments**  Click here to enter text. |

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| **Internal moderation comments if appropriate**  Click here to enter text. |

**Supervisor declaration**

I confirm that no work assessed for the award of the marks above is also to be submitted, or has been submitted, for any other accredited qualification(s).

|  |  |  |
| --- | --- | --- |
| Supervisor signature. | Date | Click here to enter a date. |
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Record of initial ideas

**To be completed by the candidate**

This page records initial meeting(s) with your supervisor to agree your project ideas. Additional pages can be submitted if more than one idea has been explored.

|  |
| --- |
| My idea(s) for topic/title  Problems in Graph Colouring |
| My ideas for research and development of my project   * Exploring different problems in graph colouring, including, the assignment problem and the four-colour theorem. * Giving examples of algorithms that can be used to solve these problems like the greedy colouring algorithm. |
| My summary of the comments and advice from my supervisor   * Ensure there is no overlap with Maths/Computer Science * Ensure there is enough research to make it a research project * Ensure there is enough scope for a 5000 word essay |
| Modifications I have made as a result of my discussion with my supervisor  It seemed that what exactly I’m researching isn’t explicit, so I have modified the title of the paper. |

|  |  |  |
| --- | --- | --- |
|  | Date | 07 November 2020 |
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Part A: Candidate proposal

**To be completed by the candidate**

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| Working title of my Extended Project.  Present the topic to be researched in the form of a short statement/question/hypothesis with clear focus.  What improvements can be made to Graph Colouring algorithms? |

|  |
| --- |
| * my initial resources will be   *Introduction into graph theory by* Richard J. Trudeau and  *A Guide to Graph Colouring by R.M.R Lewis* |
| * the courses of study or area(s) of personal interest to which the topic relates   Maths and Computer Science. |
| * my intended product   A research paper and, perhaps, a few of the algorithms implemented in python. |

Provide details of the courses that you are currently studying

|  |  |
| --- | --- |
| **Qualification type** | **Awarding body & subject** |
| eg A-level, Modern Apprenticeship, BTEC | eg AQA Mathematics, OCR Computing, WJEC English |
| A-level | Further Maths |
| A-level | Maths |
| A-level | Physics |

|  |  |
| --- | --- |
| **Qualification type** | **Awarding body & subject** |
| A-level | Computer Science |
| Click to enter text. | Click here to enter text. |
| Click to enter text. | Click here to enter text. |
| Click to enter text. | Click here to enter text. |
| Click to enter text. | Click here to enter text. |

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| **Notice to candidate** You must not take part in any unfair practice in the preparation of project work required for assessment and you must understand that to present material copied directly from any book or any other sources without acknowledgement will be regarded as deliberate deception. If you use or attempt to use any unfair practice you will be reported to AQA and you may be disqualified from **all** subjects. |

**Candidate declaration**

I certify that I have read and understood AQA’s Regulations relating to unfair practice as set out in the notice to candidates above.

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| --- | --- | --- |
| Vimal Vinod | Date | 07 November 2020 |
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Part B: Supervisor’s comments on candidate proposal

**To be completed by the supervisor**

Please comment below on the validity and feasibility of the candidate proposal (Part A) as an Extended Project

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| --- | --- |
|  | Supervisor’s comments |
| Indicate the relation to, and development/extension outside of, the main course(s) of study or interest | Vimal is a keen mathematician and will be able to use his computer programming skills to test his conclusions |
| Comment on the suitability of the proposed initial sources and research base | As long as there is no overlap into other lessons, and there is enough research available to meet the assessment objectives, this project seems feasible. |
| Confirm that the project is feasible in the proposed timescale and/or indicate any potential difficulties that may prevent the candidate from meeting the assessment objectives | As long as Vimal stays organised and sets clear deadlines, which he sticks to, the project is feasible in the timescale available. |

Indicate the expected format of the project product that will be submitted for assessment

☒ Research based written report

☐ Artefact (for example prototype, model, artwork, scientific investigation, creative writing) plus written report

Is the project a contribution to a group exercise? ☐ YES ☒ NO

If Yes, confirm that there is a defined individual contribution by the candidate ☐ YES ☐ NO

List the **other** group members below.

|  |  |
| --- | --- |
| Candidate No. Click. | Candidate Name Click here to enter text. |
| Candidate No. Click. | Candidate Name Click here to enter text. |
| Candidate No. Click. | Candidate Name Click here to enter text. |

|  |  |  |
| --- | --- | --- |
| M. Gillibrand | Date | 11 November 2020 |
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Part C: Centre coordinator’s approval of candidate proposal

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| **Supervisor’s name** |
| Click here to enter text. |
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**To be completed by the centre coordinator**

If you are acting as both the Centre coordinator and the supervisor, please seek counter signature from a senior colleague

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| Centre coordinator’s comments on the feasibility and acceptability of the proposal (parts A & B) as an Extended Project  Click here to enter text. |

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| ☐ | Approved | ☐ | Approved subject to the implementation of  the centre coordinator’s recommendations | ☐ | Resubmission required |

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| **Centre coordinator’s name** |
| Click here to enter text. |
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| Centre coordinator signature. | Date | Click here to enter a date. |
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Planning review

**To be completed by the candidate**

This page records your outline plan once your proposal has been approved.

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| My next steps in planning, researching and deadlines that I will set myself. What I intend to do, by when, what resources I will use and how I will implement the recommendations of the centre co-ordinator (where appropriate).  My research will be on improvements that can be made to Graph Colouring algorithms. For my project, there are a few algorithms I would like to implement and discussing things their usefulness and points of failure concluding with my own algorithm (which I haven’t even began to think about).  I have begun creating a graph visualizer tool which runs on a console. It should be completed soon (before 2021).  (24/12/2020)  Soon after writing that, I stopped working in the graph visualization tool because the other features were unnecessary and there were more than enough graph plotters already online.  The algorithms that I implement in my paper can, for sure, be run and verified, but they won’t be graphical.  My focus now is mainly on completing the five thousand words. I’ve set out a basic template of that needs to be written using titles all that is needed is to fill in the content. Easy-peasy, is what I’d like to say, but I have a feeling it won’t be. |
| My summary of the comments and advice from my supervisor  (07/01/2020)  I talked to my supervisor today, and he suggested that comparing the effectiveness of different techniques for improving graph colouring algorithms might be useful a good idea. |
| Modifications I have made as a result of my discussion with my supervisor and/or the comments from my centre coordinator  (07/01/2021)  Although it seemed like an excellent idea at first, it had a major drawback; even though I know a few algorithms, I only know of one method for improving them. I will see what I can do; it might require a bit more research. |

|  |  |  |
| --- | --- | --- |
|  | Date | C07 January 2021 |
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Mid-project review

**To be completed by the candidate**

This page records your outline plan when you have completed your research.

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| Is my project following my original plan? How has my plan developed?  (20/02/2021)  My project is still about graph colouring algorithms.  (25/02/2021)  Though I used the title “how can graph colouring algorithms be improved”, I need to dedicate a least a third of the essay to that. This is going to be tough. |
| My summary of the comments and advice from my supervisor  (25/02/2021)  - Evaluating methods for improving graph colouring algorithms.  - Add source evaluation in a separate table if necessary. |
| Modifications I have made as a result of my discussion with my supervisor at this stage  (25/02/2021)  At the end of each discussion about graph colouring algorithms I will evaluate methods for improving it.  I will create a separate table analysing the reliability of different sources that I have used. |
| My final title and agreed form of project product  (25/02/2021)  How can we improve graph colouring algorithms?  This is going to be a written report. |
| My planned next steps to complete my project  (25/02/2021)  At the end of each discussion about graph colouring algorithms I will evaluate methods for improving it.  I will create a separate table analysing the reliability of different sources that I have used. |

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|  | Date | Click here to enter a date. |
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Project product review

**To be completed by the candidate**

This page records the (near) completion of your project product. Outline the successes, failures, additions and/or changes you made as you followed the plan in your mid-project review

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| Did my project follow my revised plan (from the mid-project review)?  (02/05/2021)  Not exactly; I had originally planned to research proofs in graph colouring, however, I was told that that was too vague and that it was necessary for the title of the essay to be a question. So I settled on “How can I improve graph colouring algorithms?” without too much thought. I wondered how hard it would be to improve them if there were so may. The answer, as it turned out, was “non-trivial”. So I decided to keep the title as it was and just write down a summery of my research in a way that would be useful to someone trying to learn graph colouring – this is basically what research is about right? But more than likely it appears that I have missed the EPQ. |
| My summary of the comments and advice from my supervisor at this final stage  (02/05/2021)  The entire project is on the internet now, but it appears my supervisor has lost the link to it so I will have to send it to him again soon. If you happen to to tech savvy you can google “ProblemsInGraphColouring” and my project should come up as one of the first few results. |
| Modifications I have made as a result of discussion with my supervisor at this final stage  Do I need to do anything else to complete my product?  Click here to enter text. |

|  |  |  |
| --- | --- | --- |
|  | Date | Click here to enter a date. |
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Presentation record part A

**To be completed by the candidate**

This page records your presentation and its preparation.

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| Planned format of my presentation (eg timing, audience, use of visual aids, slides, use of notes, etc.)  My presentation involved a powerpoint and nothing much else (though in the re-run I made a mind map before hand because I had found it difficult to collect my thoughts).  Conjecture: There exists no person p such that p is inherently bad at public speaking.  Disproof (By Counter Example):  Vimal Vinod.  End of Proof.  Proof assumes that I am a person, but that is a minor detail. |
| Planned content of my presentation  I was instructed to keep my presentation simple, which is easy to say but once you know something it is difficult to tell if it is easy or not.  This is how I show I *should* have structured my powerpoint.  - What is a graph?  - Who discovered the field of graph theory?  - How was it discovered?  - What is graph colouring?  - How was it discovered?  - How can we colour graphs?  - How can we improve these methods? (My research topic.)  - What are its applications? |
| Modifications I have made as a result of rehearsal and/or discussion with my supervisor  Lessons I have learned:  - I’m a mathematician, not a musician (so don’t improvise).  - Public speaking is not for me.  - Don’t make PowerPoints. |

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| --- | --- | --- |
|  | Date | Click here to enter a date. |
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Presentation record part B

**To be completed by the supervisor**

Record and comment below on the delivery of the presentation

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| --- | --- |
|  | Supervisor’s record/comments |
| The nature of the audience (include numbers of staff, students and others present) | Click here to enter text. |
| The nature of the presentation (include use of notes, use of display items, and use of presentation software) | Click here to enter text. |
| Comment on the content and delivery of the presentation (for example clarity of ideas, structure of presentation, pace, engagement with audience) | Click here to enter text. |
| Comment on the response of the candidate to questions that demonstrated understanding and grasp of the project and/or its production. **Give examples of questions asked and answers given.** | Click here to enter text. |

|  |  |  |
| --- | --- | --- |
| Supervisor signature. | Date | Click here to enter a date. |
|  |  |

Summary and reflection

**To be completed by the candidate**

This page records your summary, reflection and evaluation when you have completed your project product and given your presentation.

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| --- |
| Some questions you may wish to answer in this section include, what have I learned from completing this project? What new knowledge or expertise have I enjoyed or found valuable? What are the strengths and weaknesses of my project (including planning and organisation)? What skills have I improved? What changes would I make if I undertook such work again? What advice would I give to others undertaking such a project?  In hindsight, I have to say that, despite everything, I never once regretted talking my EPQ and would definitely recommend it.  My main goal in taking the EPQ wasn’t that I was especially interested in getting myself a qualification, but to give myself motivation to learn graph theory; if I hadn’t been forced into it, there is no way I could have even dreamt of writing 5000 words about graph colouring – I still find it weird to think even just half a year ago I wouldn’t have been able to tell you what a graph was and now I can actually read though (though maybe not completely understand) maths papers on graph theory. Reading research papers was something that I had wanted to do for a long time before that but wasn’t able to.  Even if I don’t do well in this – I will say it again – I don’t regret it. Doing my EPQ was a good idea even if I don’t get an actual qualification out of it. I have basically achieved everything I wanted out of my EPQ – and – though I feel like I will regret saying this, wouldn’t mind trying this again next year with another topic (obviously still math related). Hopefully, by that point the presentation part of it might be made non-compulsory (one can always hope).  If I did ever do this type of work again – I would probably try to get as much done, as fast as possible, rather that waiting for the deadline – which is a bad habit of mine that I am still trying to break out of.  As for advice that I would give, I would probably have to say something like “get addicted to what ever your researching”. There is nothing more I can say than that; the most important part of research is that you are interested in what your are researching – if you’re not who will be?  Loving your work will make it easier for you to learn new information while “having fun”.  Examples of fun things in graph theory that I looked at even though it didn’t have much to do with my research topic:  - Dijkstra’s path finding algorithm.  - The match making algorithm.  - Theorem on friends and strangers (A result from Ramsey Theory). It states that “In any party of six people either at least three of them are (pairwise) mutual strangers or at least three of them are (pairwise) mutual acquaintances.”.  - Minimum vertex covers (May be used for deciding the best places to put distribution centres). |