**Department of Computer Science and Information Systems**

MSc Project Form

Consult the [intranet](https://www.dcs.bbk.ac.uk/intranet/index.php/MSc_Student_Projects) for information about the project. The assessment criteria which examiners apply are reproduced in Section 4 at the end of this form.

# 1. Brief proposal

After agreeing on a title and brief outline of a project with a supervisor, the student should complete part 1 of this form. There are default values for the weights of the marking aspects for both the proposal and the report. They can be altered in agreement with the supervisor for both the extended proposal (Section 2a and 2b) and the final project (Sections 3a, 3b and 3c). The weights must stay within the ranges given in brackets and must add up to 100. Students should upload the completed form to [Moodle](http://moodle.bbk.ac.uk/). See the programme intranet for more details.

## Student details

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| Student ID | 13157188 |
| Name | Konstantin Orlovskiy |
| Programme | MSc Data Science |
| Supervisor | Peter Wood |
| Email | [ptw@dcs.bbk.ac.uk](mailto:ptw@dcs.bbk.ac.uk) |

## Project details

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| **Title**: eCommerce Recommender System for Increased Basket Value |
| **Proposal outline** (approximately 200 words):  The idea is to develop the eCommerce recommender system that will propose the bundle of products with potential discount which leads to an increase of the basket value. The size of the discount is a subject of setting by the eCommerce website team.  For the purpose of the project the RetailRocket dataset will be used. It was collected from a real-wold eCommerce website during 4.5 months and is commonly used for academic purposes.  Recommendations will be made in hybrid manner (collaborative and content based) using user interactions with the items (view, add to cart, purchase) as well as item properties table. There will be two phases of recommendation:   1. item\_1-to-user: using LightFM library since it both implements the hybrid recommendation filtering and includes matrix factorisation models. For user experience, a random of the top 5-10 recommended items will be chosen. 2. item\_2-to-item\_1: three potential approaches:    * item\_2 is another top-ranked item from step 1.    * item\_2 has the highest rating for item\_1 in the cosine distance matrix.    * item\_2 is frequently bought together with item\_1.   Events will be transformed from categorical to numerical format with initial weights: view=1, add to cart = 2, purchase = 3. The weights are subject to tuning in order to achieve the best prediction results.  The timestamps will be useful to split the data into train and test dataset. It is a good reflection of real-life testing of the model. Alternatively, need to "mask" randomly for training and the masked data can be used for test. This will be a part of the experiment.  Real-time use of the model. The trained model can be updated with new inputs using the method LightFM.fit\_partial(). For better customer experience the predictions need to be made online based on current user behaviour so precomputing of recommendations won’t fit the needs. Additionally, iteratively updating the user-item relationship matrix and retraining the model is computationally extensive, so also is not suitable for the real-time predictions. |

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| **Work plan**:  The calendar view reflects the iterative approach for getting better outcomes. |
| **Departmental equipment/software required (contact the Systems Group for advice)**:  No Departmental equipment/software required according to the plan. |
| **Weights agreed with supervisor:** yes/~~no~~ (delete as appropriate) |
| **All ethical issues are routine (agreed with supervisor):** yes/~~no~~ (delete as appropriate)  If ethical issues are not routine, an ethics review form will need to be completed and submitted to the Postgraduate administrator ([pg@dcs.bbk.ac.uk](mailto:pg@dcs.bbk.ac.uk)) who will forward it to the Department’s ethics officer for consideration. The form is available on the [research intranet page](https://www.dcs.bbk.ac.uk/intranet/index.php/Research). |

# 2a. Assessment of the Extended Proposal – Supervisor

The supervisor and second marker should complete the appropriate section of this form. The weighting for each aspect (e.g. 35 for background research) is agreed between the student and supervisor, and can only be altered subsequently by providing a justification. The weights must stay within the ranges given and must add up to 100. Assign a mark for each aspect (e.g. 25 out of 35 for background research) and add these up to give the total mark. **Justify your marks** by writing comments on each aspect for consideration by the examination board and External Examiners. **Separately**, provide an overall evaluation below the table as feedback for the student. Send the completed form to the programme administrator ([pg@dcs.bbk.ac.uk](mailto:pg@dcs.bbk.ac.uk)).

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| --- | --- |
| **Supervisor**: | **Date returned**: |

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| --- | --- | --- | --- | --- |
| **Aspects** | **Comments** | **Weight** | **Mark** | **Revised mark** |
| Background research |  | 35  (30-40) |  |  |
| Presentation of the problem – aims and objectives |  | 15  (10-20) |  |  |
| Plan for developing the solution |  | 30 |  |  |
| Presentation of the proposal |  | 20 |  |  |
| Total | (Add justification for revised marks here if applicable.) | 100 |  |  |

**Comments to student**:

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# 2b. Assessment of the Extended Proposal – Second marker

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| **Second marker**: | **Date returned**: |

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| **Aspects** | **Comments** | **Weight** | **Mark** | **Revised mark** |
| Background research |  | 35  (30-40) |  |  |
| Presentation of the problem – aims and objectives |  | 15  (10-20) |  |  |
| Plan for developing the solution |  | 30 |  |  |
| Presentation of the proposal |  | 20 |  |  |
| Total | (Add justification for revised marks here if applicable.) | 100 |  |  |

**Comments to student:**

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# 3a. Assessment of the Report – Supervisor

Complete the appropriate section below (supervisor, second marker, third marker). The supervisor must confirm the date that a running version of the software developed by the student was demonstrated to you. The weighting for each aspect (e.g. 30 for implementation) is agreed between the student and supervisor, and can only be altered subsequently by providing a justification. The weights must stay within the ranges given and must add up to 100. Assign a mark for each aspect (e.g. 20 out of 30 for implementation) and add these up to give the total mark. **Justify your marks** by writing comments on each aspect for consideration by the examination board and external examiners. **Separately**, provide an overall evaluation below the table as feedback for the student. Send the completed form to the programme administrator ([pg@dcs.bbk.ac.uk](mailto:pgadmin@dcs.bbk.ac.uk)).

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| **Supervisor**: | **Date returned**: |
| *I confirm that a running version of software developed by the student has been demonstrated to me on the date shown.* | **Date software demonstrated:** |

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| **Aspects** | **Comments** | **Weight** | **Mark** | **Revised mark** |
| Specification and design |  | 20  (10-30) |  |  |
| Implementation, or execution of research |  | 30  (20-40) |  |  |
| Testing, results, analysis, critical evaluation |  | 30 |  |  |
| Presentation and completeness of report, documentation |  | 20 |  |  |
| Total | (Add justification for revised marks here if applicable.) | 100 |  |  |

**Comments to student:**

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# 3b. Assessment of the Report – Second marker

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| **Second marker**: | **Date returned**: |

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| --- | --- | --- | --- | --- |
| **Aspects** | **Comments** | **Weight** | **Mark** | **Revised mark** |
| Specification and design |  | 20  (10-30) |  |  |
| Implementation, or execution of research |  | 30  (20-40) |  |  |
| Testing, results, analysis, critical evaluation |  | 30 |  |  |
| Presentation and completeness of report, documentation |  | 20 |  |  |
| Total | (Add justification for revised marks here if applicable.) | 100 |  |  |

**Comments to student:**

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# 3c. Assessment of the Report – Third marker

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| **Second marker**: | **Date returned**: |

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| **Aspects** | **Comments** | **Weight** | **Mark** | **Revised mark** |
| Specification and design |  | 20  (10-30) |  |  |
| Implementation, or execution of research |  | 30  (20-40) |  |  |
| Testing, results, analysis, critical evaluation |  | 30 |  |  |
| Presentation and completeness of report, documentation |  | 20 |  |  |
| Total | (Add justification for revised marks here if applicable.) | 100 |  |  |

**Comments to student:**

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**4. Assessment Criteria**

To **pass (at least 50%)** a project the markers assess whether the project proposal and project report meet the following criteria. They also assess any other aspect of special relevance for the project.

Project Proposal:

* *Background research*: Potential approaches are reviewed and evaluated.
* *Presentation of the problem – aims and objectives*: The proposal specifies a suitable problem, and discusses its requirements.
* *Plan for developing the solution*: A suitable development/research method is chosen. The project is broken down into manageable chunks.
* *Presentation of the proposal*: Assessed as for the report – see below.

Project Report:

* *Specification and design*: Before starting the implementation, a specification and design of the system/software is laid out.
* *Implementation, or execution of research*: The key stages of the implementation/research are explained. The implementation/research is sound.
* *Testing, results, analysis and critical evaluation*: The report attempts to provide a clear and justified reflection upon the contribution and its limitations. It discusses how the software meets the specified requirements. A running version of the software is demonstrated to the supervisor (and an executable/source code on CD/DVD is turned in with the report).
* *Presentation of the proposal/report and documentation*: These are coherent in style and structure. They clearly communicate the student's contribution to the reader.

For a **distinction (at least 70%)**, a student would have to attempt a challenging project (this should be discussed and agreed with the potential supervisor) and gain a high grade under each of the above headings. To award a distinction the markers assess the report according to the following criteria:

Project Proposal:

* *Background research:* The student shows a clear understanding of the researched material. Potential approaches are reviewed and critically evaluated, highlighting strengths and weaknesses of each.
* *Presentation of problem – aims and objectives*: A challenging problem is specified and clearly outlined: this includes its context and the technical/user requirements.
* *Plan for developing the solution*: An appropriate development/research method is chosen and its suitability is well-justified. The project is broken down into subtasks that are logically coherent. In the case of unknowns (e.g. open research questions) “fallback” plans are laid out.
* *Presentation of the proposal*: Assessed as for the report – see below.

Project Report:

* *Specification and design*: The specification and design of the system/software shows a clear understanding of what needs to be done to meet the requirements, and is well-rounded, i.e. the components fit together in a coherent way.
* *Implementation, or execution of research*: The key stages of the implementation/research are clearly explained. The implementation/research is done to a high standard.
* *Testing, results, analysis and critical evaluation*: The solution demonstrates real insight into the problem/research question. There is clear and justified reflection upon the contribution and its limitations. The key results are accurately analysed and their relevance is explained. It is discussed how the software meets the specified requirements and is shown to be reliable. The author critically assesses the results and draws relevant conclusions from the study. A running version of the software is demonstrated (as above).
* *Presentation of the proposal/report and documentation*: Complex issues are explained clearly and concisely. The content is well-organised and structured in a way that demonstrates the links between the concepts presented. The proposal/report shows that the student clearly understands the researched material. The solution and any other claims made by the students are well-justified. The author uses various resources and cites relevant resources using an appropriate consistent referencing style. The proposal/report is of professional quality and contains very few, ideally no, typographic errors.

Work that meets some, but not all, of the criteria for distinction may be considered for a **merit (between 60% and 69%)**. A merit might be awarded for a respectable, if only partially successful, attempt at a challenging project, or for a less ambitious project carried out, and written up, to a high standard.

The separate examiners grade the project independently and then meet to arrive at an agreed grade. Students may be called upon to make a presentation of their projects to a sub-committee of the Examination Board to demonstrate their grasp of the material.