**Project Name: MMV – Multithreaded Mandelbrot Viewer**

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* **Prepared by**
* Anuradha Bhate
* David Livingston
* Adam Bolte
* **Date :** 02-14-2011
* **Project objectives:**

Provide below a brief overview of this project (e.g., project purpose and justification):

* **Project description:**

The proposed program will render images from the Mandelbrot set. Although there are many such programs available, most recent open source examples lack one or more of a number of important features: multiple threads to take advantage of today’s processors, arbitrary precision arithmetic to explore the fractal at high levels of magnification, the ability to render HD images suitable for display as art or use as screensavers, user control of the color palette used, and even the ability to save the generated images. With three students devoting a semester to the project, we believe we can implement most if not all of these features and deliver a program superior to most of the open source fractal viewers currently available.

**3.1. Project scope:**

**Includes (list Deliverables):**

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* Executable Program – most likely in the form of an executable JAR (Java ARchive)
* Source Code
* Unit Tests – most likely JUnit
* Program Documentation – most likely extracted from source code with the Javadoc utility
* User Documentation – although the user interface should be intuitive the documentation will provide an overview of the program and discuss each program feature. It will also show sample output images and describe the steps needed to reproduce them.

**Does Not Include:**

Anything not listed in ‘Deliverables.’ Including, but not limited to, team member communications, code history from a version control system, and UML class diagrams.

**3.2 Project Milestones:**

|  |  |
| --- | --- |
| **Estimated Schedules – List key project milestones relative to project start. (Insert rows as needed)** | |
| **Project Milestone** | **Target Date (MM/DD/YYYY)** |
| * Official Project Start | 20 Feb 2011 |
| * Very Simple Prototype Completed | 27 Feb 2011 |
| * Design Completed | 12 Mar 2011 |
| * High Quality Version of Basic Functionality Complete | 4 Apr 2011 |
| * Additional Features Completed – Project Freeze: no further new development. Focus on testing and completing other deliverables. | 22 Apr 2011 |
| * Project Complete | 1 May 2011 |

**3.3 Risk Assessment**

* **Developer Absence or Minimal Productivity:** with only three programmers a nonproductive member will significantly decrease the team’s productivity. This risk cannot be eliminated but it can be decreased by regular group communication, accountability to meet reasonable deadlines, ensuring the project tasks are assigned as much as possible based on the abilities and interests of specific members, etc. An incremental development plan should allow us to reduce the number of planned features and still have a working deliverable if we experience a significant decline in productivity.
* **Inaccurate Estimation of Delivery Date:** since the three of us have never worked together before, it is difficult to estimate our productivity. There is nothing we can do to minimize this particular risk. We have also never designed an application similar to this and it relies on some technologies no one in the group is knowledgeable in (multithreaded programming and arbitrary precision math). We could have selected a different project to minimize these two risks but none of our proposed projects would have completely eliminated this risk either. Our incremental development plan is attempt to minimize this risk as much as possible.

**3.4 Critical Success Factors (optional)**

**3.5 Roles**

|  |  |  |
| --- | --- | --- |
| **Name** | ***Role*** | ***Contact Information*** |
| Anuradha Bhate | Group Leader; Programmer; duties essential to the project that are not assigned to another group member. |  |
| David Livingston | Programmer; Prototype Developer; other duties as assigned by group leader (e.g. testing). |  |
| Adam Bolte | Programmer; other duties as assigned by group leader (e.g. documentation). |  |

**3.6 Resource Requirements**

**Software:** the executable will run on any machine with the most recent stable release of the Java Runtime. It will be tested on recent versions of Windows (at least XP and 7) and at least one popular Linux distribution, e.g. Ubuntu or Mint. All other deliverables will be provided in a format that is as platform agnostic as possible (e.g. documentation will be delivered in \*.pdf or \*.htm format).

**Hardware:** we have not selected the minimum hardware requirements yet. Performance will be an issue for some inputs (e.g. rendering an HD image with at a high number of iterations), but more modest hardware should be able to use the program to generate less ambitious images. The deliverable ‘User Documentation’ will contain details about recommended hardware for various image qualities.

* **Project Control:**
* **Team Meetings and communication**

We are going to meet online every Friday at 8pm Central for reviewing the progress in that week.

*A project collaborate link will be established on the Internet to provide access to the project documentation by geographically dispersed project members.*

* **Daily Status Reports**

A thread for each month will be created in our group area of Blackboard. The group leader will make a new thread for each day giving a status update. Each other group member will reply to the day’s thread with their own status update. Replies may be made in the day’s thread but the group leader may choose to make a new thread for issues regarding extensive discussion.

**3. Change Management**

*Example:*

*The change control procedures to be followed will be consisting of the following processes:*

*A Change Control database will be established by the project manager to track all changes associated with the project effort.*

*All Change Requests will be assessed to determine possible alternatives and costs in terms of time and efforts required.*

*Change Requests will be reviewed by the team and approved by the project leader.*

*The effects of approved Change Requests on the scope and schedule of the project will be reflected in updates to the project plan.*