**3.0 Risk Mitigation and Contingencies**

**3.1 Project Risk Table**

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| --- | --- | --- | --- | --- | --- |
| **Risk** | **Description** | **Probability** | **Impact** | **Mitigation** | **Contingency** |
| **Dangerous Travel Conditions** | This project takes place during the winter semester of school. At some point the roads may become dangerous or undrivable. | Medium | Medium | All team members will monitor weather reports online and in the news. | Multiple sources of mobile communication have been put in place to allow meetings and discussion to take place without being face to face. An alternative meeting location has also been chosen. |
| **External Obligations** | All team members are students and it is likely we will all have other assignments or obligations throughout the semester. | High | Medium | A google calendar will be used to keep track of updated availability in case a team member is given an important assignment in another class. | A team member may pass on some work to another volunteering member under the agreement that they will pick up extra slack at another point of the project. All work must be even by the end of the project cycle. |
| **Loss of Work/Data** | Since we are working with computers, there is always a chance of random failure that results in lost work. | Low | High | Weekly backups will be kept of our GitHub repository. In addition, team lead Erik will keep an additional backup of the repository on google drive. | In the event of data loss, we will resort to our last weekly backup of the GitHub repository. If that source is unusable for some reason, we will use the secondary back up provided by Erik. |
| **Team Switching/Loss of Member** | It has been hinted that team members will be switched at some point during the project. In addition, there is also a chance that a team member may be lost. | High | High | All team members will keep track of each member’s responsibilities as the project progresses. Team members will also be sure that their work is clear and easy to understand. | If a team member is lost, their assignments and documents will help their replacement understand their work and quickly continue it. If the team lead is lost, Cindy will take over administrative position. |
| **Unfavorable Outsourcing** | Part of our code will be outsourced. There is a chance that the code we receive will be poor and unusable. | High | High | The team will make sure the algorithm we supply to our outsource will be clear and easy to understand. | If the code we receive is still unusable, then we will use the algorithm we wrote to produce a version ourselves to save time rather than trying to fix a code that is beyond repair. |

**3.2 Overview of Risk Mitigation, Monitoring, and Management:**

**Hazardous Travel**

Overview:

Given it being the winter semester, the likeliness that travel will become difficult and dangerous is very high. Weekly meetings are planned for Sunday evenings, but we cannot always be sure everyone can safely arrive. To prevent meeting disruption, weather will be monitored regularly through online resources and news stations.

**In the Event of Hazardous Travel**

Alternative means of communication will be established in case an in-person meeting cannot occur. Slack has already been established as a main mobile source of communication by all team members. If necessary, visual means such as skype can also be utilized to add visual communication. In the event of library closure, the team has agreed on an alternative meeting location at Biggby Coffee at 25421 Ford Rd. This location is conveniently located for all team members. Task assignments will be discussed in person and reiterated on Slack.

**School and Other Obligations**

Overview:

Our team consists entirely of students. That means that all of us at some point or another will have other work that must be dealt with. Exams, projects, and other tasks will be assigned to all of us in other classes throughout the semester. We cannot expect every team member to be able to contribute all their time to this project the entire semester. Therefore, tasks must be distributed to accommodate each team member's schedule and obligations. To accommodate, we have created a Google Calendar that all team members have access to. It is here that they may list dates they cannot attend meetings in their normal availability. This will be updated every week before Sunday. Additionally, we must make sure that this distribution stays even amongst the team throughout the semester. Any slack given must be made up at another point in the semester by that team member.

**In the Event of External Obligations**

If a team member has another obligation that must be attended to, they may have some of their tasks picked up by another team member. However, by passing tasks on to another member, this team member agrees to take on extra responsibility on the next set of tasks assigned. This will keep the distribution of work fair and even throughout the project. Under no circumstances should one team member be doing more work than the rest involuntarily and without future compensation from the teammate he is taking extra work from.

**Loss of Work or Data**

Overview:

When working with any form of technology, sudden loss of data is always a possibility. Careful measures should be taken throughout the project cycle to minimize the chances of this occurring should be taken. A weekly backup off all uploads on GitHub will be downloaded once per week via the GitHub desktop app while the project is underway. Additionally, an secondary backup will be kept on Google Drive by team lead Erik in case GitHub becomes unavailable. This will minimize the amount of work that could be lost under catastrophic failure. If backups are kept diligently, a worst-case scenario would only produce a week's worth or less of lost data. Keeping contents shared among team members will also mitigate losses and make lost information easier to reproduce.

**In the Event of Loss of Data**

In the event data is lost, the team will roll back to the latest version available of the document that was lost from our last backup. The GitHub recovery will be used primarily, however the secondary backup will also be prepared in case the first is lost or unusable. A worst-case scenario should be at max a week's worth of work (assuming weekly backups are kept). It is also advised that documents be shared amongst the team so that more than one person knows the contents of documents. This way, the information is more spread amongst the team and makes it easier to replicate the lost information.

**Team Switching or Loss of Member**

It has been made apparent that at some point during the project cycle we will lose one or more members of our team. Team members should do their best to make sure that their work is done cleanly, clearly, and is well documented. Additionally, everyone should know and understand what each member of the team is doing and is responsible for throughout the project.

**In the Event of Loss of Member**

If all the mitigation strategies are followed, the transition of new team members should be smooth. If all team members understand the tasks each member takes then there should be a smooth transition between new members. We can use previous documents and notes from each task to better clarify and complete any unfinished work from a lost member. Maintaining traceability is also critical, as it will make it much easier to track progress and process, making understanding others work much easier. Ideally, any new member should be able to understand the process we have followed quickly and can contribute to the project.

**In the Event of Loss of the Team Lead**

Admin privileges will be given to team lead Erik and to Cindy. Dispersal of the documents ensures no information is left to only one person to have access too. This will allow a smoother transition in the event we lose our team lead. However, the team lead still holds all administrative powers unless stated otherwise. In the event that the team lead is lost, his administrative privileges will be handed off to Cindy to take over. This ensures that no unnecessary modifications or edits are made without the consent of the team. This prevents any hard to find errors or code breaking changes from slipping past the teams vetting process.

**Outsourcing**

Overview:

Outsourcing refers to giving work to an outside source to be completed for us. It has been inferred that we may be outsourcing some of our coding to a CIS 200 student. To minimize the risk of this code being unsatisfactory, steps will be taken to ensure the code of sufficient quality. We must be sure our algorithm is detailed and as clear as possible. The easier it is to understand, the more likely we will receive a favorable result.

**In the Event of Unfavorable Outsourcing**

It has been agreed that while our code is being outsourced, we will closely monitor its progress as its being written. If the code seems favorable and well done, then we will continue to use that code and integrate it with our plans. However, if we find that the code we receive is poorly done or incomplete beyond repair, we will use the same algorithm we supplied the external source to write the code ourselves. We believe that this is much more cost effective than spending too much time re-writing the code given. This will be done only if we believe the code received is unsalvageable.