American International University-Bangladesh (AIUB)

Department of Computer Science

Faculty of Science & Technology (FST)

PROJECT TITLE

A Software Engineering Project Submitted
By

Semester: Summer_24_25		**Section: A**	**Group Number: 5**	
SN	Student Name	Student ID	Contribution (CO3+CO4)	Individual Marks
01	ANANNYA TITHI	22-48992-3	25%	
02	PALASH KUNDU	22-48495-3	25%	
03	ESRATUL JANNAT JUI	22-49013-3	25%	
04	TANSIF TUSHAN	22-48514-3	25%	

The project will be Evaluated for the following Course Outcomes

CO3: *Select* appropriate software engineering models, project management roles and their associated skills for the complex software engineering project and evaluate the sustainability of developed software, taking into consideration the societal and environmental aspects	Total Marks	
Appropriate Process Model Selection and Argumentation with Evidence	[5 Marks]	
Evidence of Argumentation regarding process model selection	[5Marks]	
Analysis the impact of societal, health, safety, legal and cultural issues	[5Marks]	
Submission, Defense, Completeness, Spelling, grammar and Organization of the Project report	[5Marks]	
CO4: *Develop* project management plan to manage software engineering projects following the principles of engineering management and economic decision process	Total Marks	

Develop the project plan, its components of the proposed software products	[5Marks]	
Identify all the activities/tasks related to project management and categorize them within the WBS structure. Perform detailed effort estimation correspond with the WBS and schedule the activities with resources	[5Marks]	
Identify all the potential risks in your project and prioritize them to overcome these risk factors.	[5Marks]	

Description of Student's Contribution in the Project work

Student Name: ANANNYA TITHI
Student ID:22-48992-3
Contribution in Percentage (%): 25%
Contribution in the Project:

- Explained how gesture-based control improves accessibility and replaces traditional input devices
- Identified users with motor limitations and the broader impact on inclusive design
- Helped define sprint goals and led planning for design and estimation phases
- Took lead in UI/UX design, risk analysis, and effort estimation during early and mid-phases

_____Anannya _____
Signature of the Student

Student Name: PALASH KUNDU
Student ID: 22-48495-3
Contribution in Percentage (%): 25%
Contribution in the Project:

- Explained how gesture tracking improves user interaction and supports hands-free control
- Highlighted relevance for users in creative fields and those needing alternative input methods
- Took part in sprint reviews and testing cycles to refine system behavior

- Worked on activity diagrams, UI/UX support, and testing during mid and final phases

_____Palash_____
Signature of the Student

Student Name: ESRATUL JANNAT JUI
Student ID: 22-49013-3
Contribution in Percentage (%): 25%

- Explained how the system structure supports smooth gesture recognition and drawing features
- Focused on students and educators as target users, highlighting ease of use and learning benefits
- Participated in sprint planning and task breakdown using WBS • Contributed to UI/UX design, class diagram creation, and task scheduling in early development

_____Jui_____
Signature of the Student

Student Name: TANSIF TUSHAN
Student ID: 22-48514-3
Contribution in Percentage (%): 25%
Contribution in the Project:

- Explained how gesture-based input enhances human-computer interaction and drawing precision
- Identified tech-savvy users and accessibility-focused communities as key beneficiaries
- Helped organize sprint timelines and coordinated scheduling tasks
- Contributed to UI/UX design, use case diagrams, and project scheduling in planning and execution phases

_____Tansif_____
Signature of the Student

1. **Risk Table for Gesture-Based Cursor Control Project**

Risk	**Category**	**Probability**	**Impact**	**RMMM (P × I)**
Gesture recognition fails in varied lighting	UT	80%	3	2.4
Hardware (camera/sensor) not compatible	UT	60%	2	1.2
Delay in module integration	PS	40%	2	0.8
UI/UX not accessible for all users	ST	60%	3	1.8
Requirements change mid-development	PS	80%	4	3.2
Team member unavailable during key phase	ST	60%	3	1.8
OpenCV/MediaPipe bugs during implementation	UT	40%	4	1.6
Lack of testing coverage	ST	60%	2	1.2
Data loss during testing	PS	20%	4	0.8
Scope creep due to feature requests	ST	80%	3	2.4

Impact Scale :

- **1 – Catastrophic**
- **2 – Critical**
- **3 – Marginal**
- **4 – Negligible**

A Framework for Dealing with Risk

1.Risk Identification –

- Inconsistent gesture recognition due to lighting or background noise
- Hardware limitations (e.g., webcam resolution, sensor compatibility)
- Bugs in OpenCV or MediaPipe integration
- UI/UX not meeting accessibility standards
- Team member unavailability or delays in module handoff
- Scope creep from late feature requests
- Data loss during testing or versioning

2.Risk Analysis and Prioritization –

- **High Priority**: Gesture misrecognition, OpenCV bugs, scope creep
- **Medium Priority**: Hardware issues, UI accessibility gaps, team delays
- **Low Priority**: Data loss (if backups are in place), minor UI glitches
- Prioritization is based on probability × impact (as shown in your RMMM table)

3. Risk Planning –

- Use adaptive thresholding and test gestures in varied environments
- Validate hardware early and keep backup devices ready
- Modular testing and version control for OpenCV/MediaPipe
- Follow WCAG guidelines and conduct peer reviews for UI
- Weekly sync-ups and shared documentation to manage team delays
- Freeze scope by week 10 and document all change requests
- Use Git for version control and automated backups

4. Risk Monitoring –

- Ongoing testing of gesture accuracy under different conditions
- Weekly review of module progress and team availability
- UI feedback loop from mock users or faculty
- Monitor Git commits and bug logs for technical issues
- Adjust mitigation strategies as new risks emerge or old ones evolve

1.Risk Planning Strategies

1. Risk Prevention / Avoidance

- Extend module development timelines in your Gantt chart to avoid schedule overruns
- Limit scope creep by freezing feature additions after week 10
- Choose stable libraries (e.g., OpenCV, MediaPipe) and test hardware early to avoid compatibility issues

2. Risk Reduction

- Use Figma prototypes and peer reviews to reduce UI/UX accessibility issues
- Modularize code and test each component separately to reduce integration bugs
- Conduct gesture recognition tests under varied lighting to reduce false positives

3. Risk Transfer

- Assign backup roles within your team to transfer responsibility if someone is unavailable
- Use Git version control to safeguard against data loss and testing errors
- Document all requirements and changes to reduce ambiguity and shift accountability

1.Risk Reduction Leverage (RRL) –

Scenario: Gesture misrecognition due to lighting variation

- **REbefore**: 30% chance of misrecognition causing $5,000 worth of rework and testing delays
- **REafter**: Adaptive thresholding and lighting calibration costing $600 reduces risk to 10%

Calculation:

$$\text{RRL}=\frac{(0.3\times5000)-(0.1\times5000)}{600}=\frac{1500-500}{600}=\frac{1000}{600}\approx 1.67$$

RRL > 1.00 → Mitigation is cost-effective and worth implementing

Rubric for Project Assessment (CO4)

Marking Criteria	Marks Distribution (Maximum 3X5=15)				Acquired Marks
	Inadequate (1-2)	**Satisfactory (3)**	**Good (4)**	**Excellent (5)**	
Project Planning	No background information regarding the project is given; project goals and benefits are missing.	Insufficient background information is given; project goals and benefits are poorly stated	Sufficient background information is given; the purpose and goals of the project are explained.	Thorough and relevant background information is given; project goals are clear and easy to identify.	
Effort Estimation and Scheduling	Student vaguely discuss the impact of societal, health, safety, legal and cultural issues in their project	Student provided with partial relevance to the impact of societal, health, safety, legal and cultural issues in their project	Student fairly provided the analysis to the impact of societal, health, safety, legal and cultural issues in their project	Student comprehensively provided the analysis to the impact of societal, health, safety, legal and cultural issues in their project	
Risk Management	Ambiguous representative example.	Partially identify / indicate towards reallife example.	Real-life example is fairly connected towards the definition.	Comprehensively defend with real life example.	
				Acquired Marks:	
				CO Pass / Fail:	