[This is a template, remove any text within third brackets before submission]

Student Name	Student Id	Statement of contribution to the report
Nur E Siam	103842784	

[Add a statement on acknowledgment of the country.]

Each team member identifies:

the <u>Traditional Owners</u> of the land they lived on while completing this work (if living in Australia)…[Please complete the statement].

1. SPRINT PLAN – ANKIT

[This document can be considered as a continuation of last sprint report which ran from week 1 to week 3. In this section the teams need to provide a detailed sprint backlog, along with estimation for this sprint (week 4 to week 6). The roles (specifically scrum master) should be specified for this sprint, and the overall goal of the sprint should be discussed. As part of the sprint, if you plan to develop any artifact (module of application, any other documentation such as test plan, user document etc), please list all those, and those should be submitted as attachment to this report.]

2. QUALITY MANAGEMENT PLAN AND OUTCOME – AARADHYA & RUFFIN

At this stage we have majority of the solution developed, it is a good time to finalize the quality management plan. This section should include the details of any quality management activities undertaken already and all that are planned. Please note that a good quality management plan should not only state the goal, but also details on how to we assess whether the goal has been met or not. This can be an incomplete work, however, please include the results of the testing that has been done already and the tests that are planned for future.

2.1 Overview

As development of the BanglaGhor real estate platform progresses, establishing a structured quality assurance framework is essential. The quality management strategy has been formulated to ensure the platform meets both technical standards and user expectations specific to the Bangladeshi market. This section outlines the quality goals, planned assessment activities, and the strategic focus areas for Sprint 2.

2.2 Core Quality Priorities

Our quality strategy focuses on these essential areas:

1. **Feature Reliability** - Ensuring all system functions operate correctly without defects
2. **Interface Excellence** - Creating an approachable, efficient interface for both English and Bangla users
3. **Speed and Efficiency** - Delivering fast response times regardless of device capabilities
4. **Data Protection** - Safeguarding user information and authentication processes
5. **Cultural Adaptation** - Offering authentic Bangla content that respects local expectations
6. **Device Flexibility** - Supporting various browsers and screen sizes
7. **Universal Access** - Making features available to users of differing abilities

2.3 Evaluation Strategies

Our evaluation framework combines systematic technical assessment with real-world usage testing to ensure comprehensive quality coverage. We prioritize automated testing for repetitive elements like API connections and database operations, while employing manual expert review for subjective aspects such as interface design and cultural appropriateness. This dual approach allows us to efficiently verify technical functionality while ensuring the application meets the specific needs and expectations of our Bangladeshi user base.

2.3.1 Planned Testing Methods

- **Automated Evaluation**: To verify backend functions, API connections, and database transactions.
- **Human Review**: To assess user interface behavior, content translation, and layout responsiveness.

2.4 Current Testing Outcomes
Our initial quality assessments have produced solid results across all key application areas, with only minor enhancements needed to meet client expectations. The user authentication system functions effectively with proper password security and login verification, though the client has suggested adding OTP email verification as an additional security layer. Google Maps integration has been successfully implemented with accurate property location marking and directions functionality, though optimization is needed for mobile users experiencing slower loading times. The improved UI/UX design demonstrates significant progress in responsiveness and visual cohesion, but client feedback indicates a need for further cultural adaptation to better align with Bangladeshi real estate norms rather than Western design conventions. We've documented all identified enhancement opportunities and prioritized them for implementation in the current sprint.

2.4.1 Completed Assessments

User Account System
- **Areas Examined**: Sign-in, registration, password protection
- **Findings**:
    - Successfully implemented secure information storage
    - Account creation working as expected
    - Authentication functioning properly as confirmed in testing
    - Enhancement Opportunity: Client suggested adding OTP email verification as an additional security feature

Map Feature Implementation
- **Areas Examined**:
    - Map display, property locations, navigation assistance
- **Findings**:
    - Maps appearing correctly with proper external connection
    - Property pins accurately positioned
    - Route finding feature working effectively

User Interface Design
- **Areas Examined:**
    - Layout responsiveness, visual consistency, navigation flow
- **Findings:**
    - Updated color palette successfully implemented
    - Layout adapts to most screen dimensions
- **Issue Identified**:
    - Bangla language support not yet available
- **Planned Improvements**:
    - Revise interface to better reflect Bangladeshi market preferences
    - Implement dual-language capability in current sprint

2.5 Upcoming Quality Assessments

Building on our initial testing success, we've identified key areas requiring focused evaluation in the current sprint. Our upcoming quality assessments will target language localization, search functionality enhancement, security protocols, and property listing capabilities to address client feedback and market requirements. These assessments will employ both technical verification methods and user-centered testing approaches to ensure the application meets both functional requirements and user expectations.

2.5.1 Priority Testing Areas

1. **Language Support Verification**
   - **Objective**: Confirm effective bilingual functionality
   - **Success Measures**:
     - Bangla characters display without formatting problems
     - Translations remain consistent across all sections
     - Content respects cultural expectations
   - **Evaluation Methods**: Manual review by native speakers, text validation tools
2. **Property Search Enhancement**
   - **Objective**: Ensure robust property finding capabilities
   - **Success Measures**:
     - Filters (bedrooms, bathrooms, price range) produce expected results
     - System handles partial or misspelled search terms
     - Quick response times for search operations
   - **Evaluation Methods**: Systematic testing with predefined scenarios

3. **Information Protection Review**
   - **Objective**: Confirm user data safeguards
   - **Success Measures**:
     - Proper handling of personal information
     - Effective implementation of verification codes
     - Controlled display of location details as requested by client
   - **Evaluation Methods**: Security analysis tools, simulated attack testing

4. **Property Listing Capability**
   - **Objective**: Verify new property submission features
   - **Success Measures**:
     - Complete transfer of property details and images
     - Appropriate validation of essential information
     - Accurate display of submitted properties
   - **Evaluation Methods**: End-to-end workflow testing

2.5.2 Performance Targets // Make a box

2.6 Quality Strategy Adjustments:

Based on our initial sprint results and client feedback, we've revised our quality approach in these ways:

- **Added Account Verification Assessment**
  - Incorporating verification code testing based on client recommendations
  - Establishing standards for notification delivery and user experience
- **Strengthened Cultural Adaptation Focus**
  - Expanded language implementation testing
  - Added cultural appropriateness as a design evaluation criterion
- **Revised Privacy Approach**
  - Created test procedures for controlled address visibility
  - Developed privacy-focused scenarios for location information
- **Enhanced Search Capability Testing**
  - Added scenarios for partial text searches
  - Established performance measurements for search operations
- **Incorporated Property Description Testing**
  - Developed evaluation methods for the client-suggested description generation
  - Created checks for description accuracy and relevance

2.7 Issue Management Process

Our approach to handling identified problems follows this workflow:

- **Discovery**: Problems documented with importance level and reproduction steps
- **Assessment**: Weekly meetings to prioritize issues
- **Delegation**: Problems assigned to appropriate team members
- **Correction**: Developers implement solutions with proper verification
- **Confirmation**: Quality team verifies the fix works correctly
- **Resolution**: Issue marked as resolved after confirmation

Issue Classification
- **Critical:** System failures, data loss, security breaches

- **Moderate:** Features working incorrectly, significant interface problems
- **Minor:** Visual inconsistencies, enhancement requests, non-blocking issues

2.8 Quality Success Indicators

We'll consider our quality goals achieved when:

- **Functionality**: All essential features work as specified
- **User Experience**: Test users provide positive feedback
- **Language Support**: Bangla implementation works flawlessly
- **Security**: No significant vulnerabilities found in final checks
- **Compatibility**: Consistent experience across major browsers

2.9 Path Forward

Our quality management strategy has evolved based on first sprint outcomes and client input. Our focus for the current sprint will be implementing remaining test procedures and addressing identified issues, particularly regarding language support, search capabilities, and account verification.

Key upcoming activities include:

- Conducting thorough language implementation assessment
- Performing security review with enhanced authentication
- Confirming all client-requested changes work correctly

These measures will help us deliver a reliable, user-friendly real estate platform tailored to Bangladeshi market needs.

3. SPRINT PROGRESS - ASHIM

This section describes the progress of the sprint with relevant evidence (e.g. screenshots of repository, task board etc). The evidence should indicate team members' contributions. The evidence can be discussed with the supervisor.

We use Jira to keep track of tasks, check progress, and stay on schedule so we can complete what we planned for the sprint. Below is the overview of the task assigned individually and in a group.

1. Send OTP email after signup. (Ankit and Prabesh)
2. Add Forgot Password page (Ankit/prabesh)
3. Add dual language support (e.g., Bengali and English) (Nur and Ruffin)
4. Make platform more specific to Bangladesh (figure out how: currency, location, listings, etc.) (Rufin and Siam)
5. Add "Land" as a property type: (Rufin and Aaradhya)
   a.Upload images of land
   b. Add land filter
6. Generate property description in the advertisement (Shivam)
7. Integrate MongoDB with AWS Cognito (ashim and prabesh)
8. Adding EC2 instance for back-end server -MongoDB (In Amplify or EC2 Linux Server)(Ashim)-In Progress

The image below demonstrates the task allocation among team members and the tracking of project progress using Jira. It also highlights how current bugs or issues are recorded, allowing the team to stay informed and on the same page.

Fig: Jira Management Dashboard

A. Send OTP authentication -Status – Done

Following image depicts the evidence of the task met by Prabesh and Ankit

Fig: Signup with new account

Your verification code `Inbox ×`

no-reply@verificationemail.com
to me ▾

Your confirmation code is 402679

Fig: Authentication

User name	Email address	Email verified	Confirmation status	Status
○ 09de54c8-7061-7033-4b53-105dc47f...	t7263241@gmail.com	Yes	Confirmed	⊘ Enabled
○ 293e6438-90e1-70cd-e2a2-232a5c91...	bhattaraiprabesh51@gmail.com	Yes	Confirmed	⊘ Enabled
○ 398e6458-30f1-701c-a3e3-60eacd74...	shivamsharma39893@gmail.com	Yes	Confirmed	⊘ Enabled
○ 495e84e8-50b1-7097-e547-e127bef4...	ruffin.r360@gmail.com	Yes	Confirmed	⊘ Enabled
○ 690e24a8-6061-703a-5cb1-c25906c6...	ashimadhikari118@gmail.com	Yes	Confirmed	⊘ Enabled
○ 69ee94b8-50a1-70a6-159b-78fbdaf1...	ankitmalik101.am@gmail.com	Yes	Confirmed	⊘ Enabled
○ 799ed488-c001-70a0-4b02-c3ce4a9a...	bhattaraipeter51@gmail.com	Yes	Confirmed	⊘ Enabled

Fig: Authentication verification at AWS Cognito

B.Add Forgot Password page –Status – Done

Following image depicts the evidence of the task met by Prabesh and Ankit

Forgot Password

Email *
t7263241@gmail.com

Send Verification Code

Back to Sign In
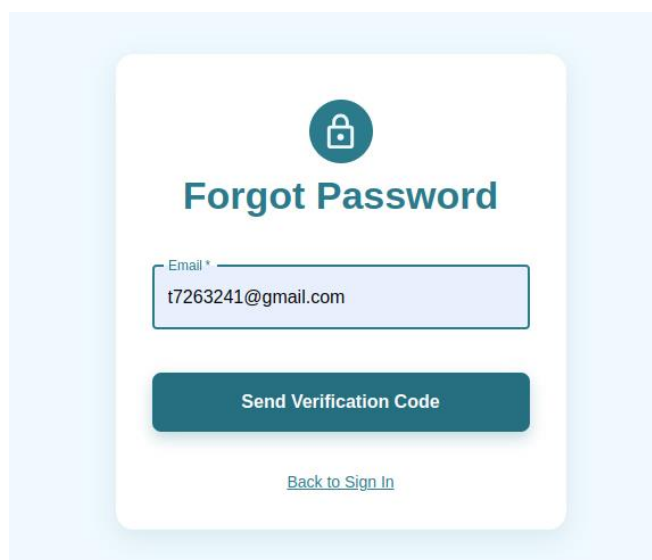
C. Add dual language support (e.g., Bengali and English)-Status-Done

Following image depicts the evidence of the task met by Nur and Ruffin
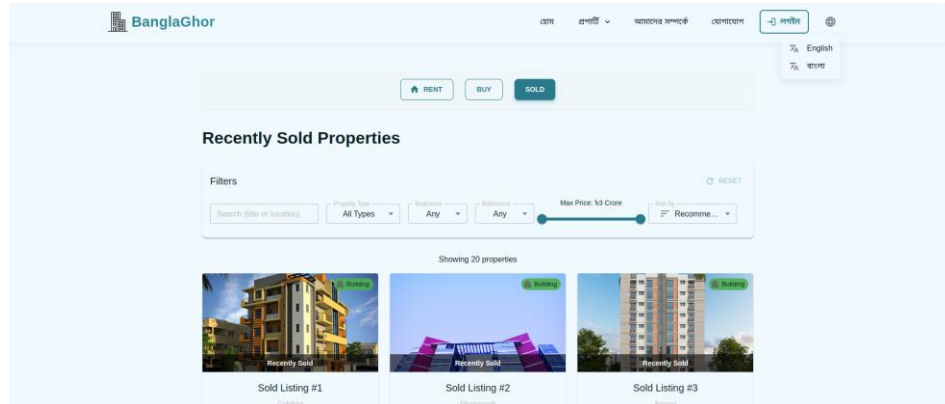
D. Make platform more specific to Bangladesh; addition of currency, location, listing

Following image depicts the evidence of the task met by Nur and Ruffin
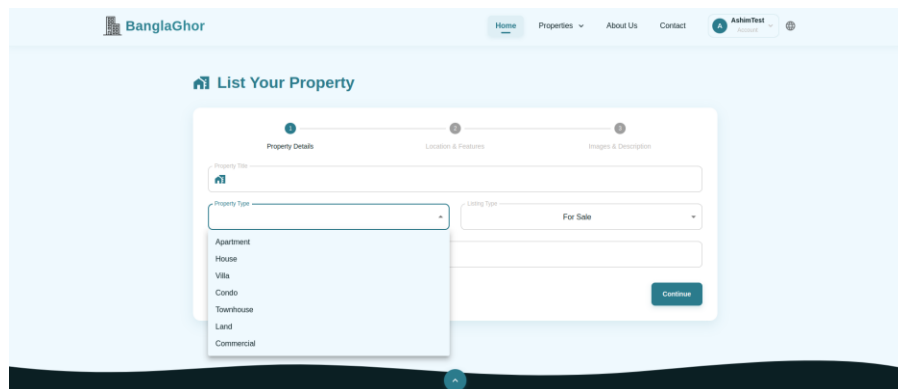
Fig: addition of Land
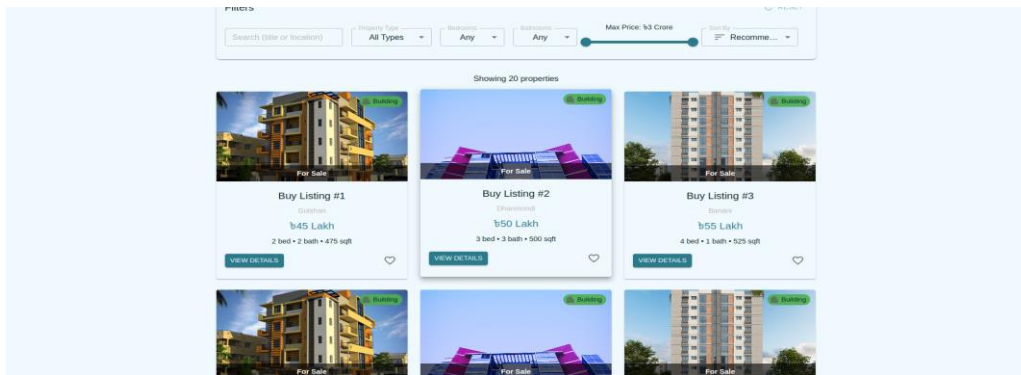
Fig: addition of currency

E. Add "Land" as a property type- Status -Done
a.Upload images of land
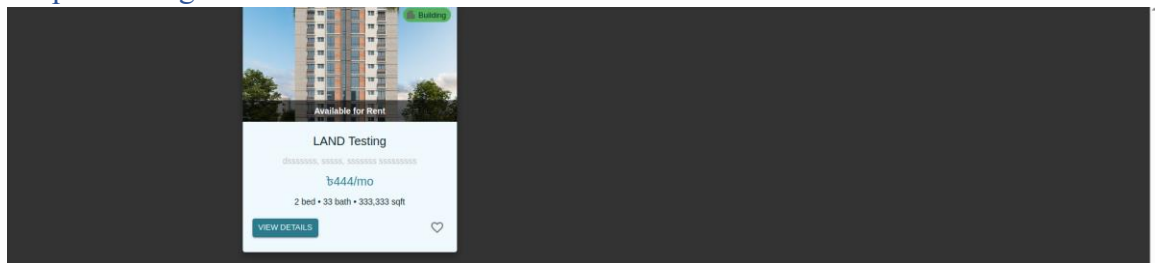
b. Add land filter

F. Add land filter Generate Property Description in the advertisement – Status -Done

Following image depicts the evidence of the task met by Shivam

USE THIS DESCRIPTION

Translate to Bangla

Use Bangla Description

Bangla Description:

স্বাস্তিক তিন ঘর ঘর মোহাম্মদপুর প্রথম লোকেশন থেকে - এক প্রফেসিওনাল বিদ্যুতা উপায়!

এখানে আপনার সব উপকরণ ও সম্মান থেকে স্বাস্তিক তিন ঘর ঘর দেখুন, যা আপনার সব উপকরণ ও উপযাগীতা থেকে স্বয়ংক্রিয়ভাবে সম্পাদিত হয়েছে। এটি মোহাম্মদপুর, ঢাকা একটি উপকৃত ঠিকানায়, রোড 17 ধোড়া 15 এ স্থিত হয়েছে। এই ঐ ফায়স থেকে স্বপ্ন ও স্বাস্থ্য থেকে একটি উনিক কম্বিনেশন প্রদান করেছে।

এটি 60,000 টাকা থেকে উত্তর ধনা থাকে। এটি 350 ক্লায়ার ফিট

Fig: Translation to Bangla

G.Integrate MongoDB with AWS Cognito –Status-Done

Following image depicts the evidence of the task met by Ashim and Prabesh

H.Adding EC2 instance for back-end server MongoDB – Status –In Progresss

Following image depicts the evidence of the task met by Ashim and Prabesh
This server is carried out as a backup plan in case the current Amplify doesn't support MongoDB.

4. SPRINT REVIEW (CRITICAL REVIEW OF THE PRODUCT) - PRABESH & SIAM

[Add a detailed report on the following
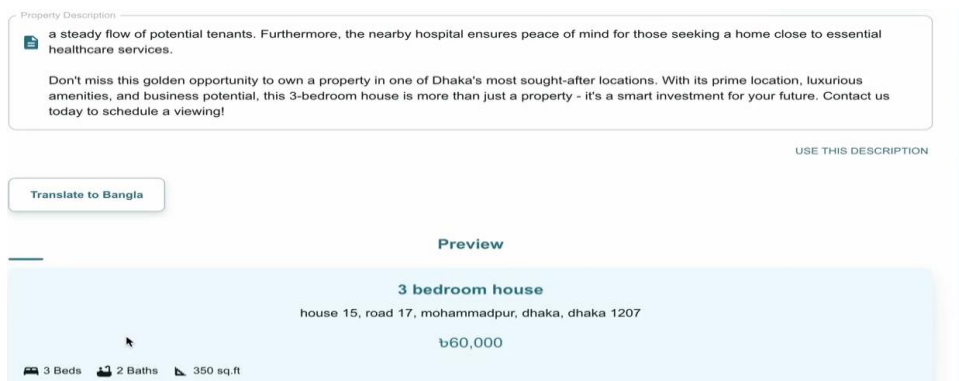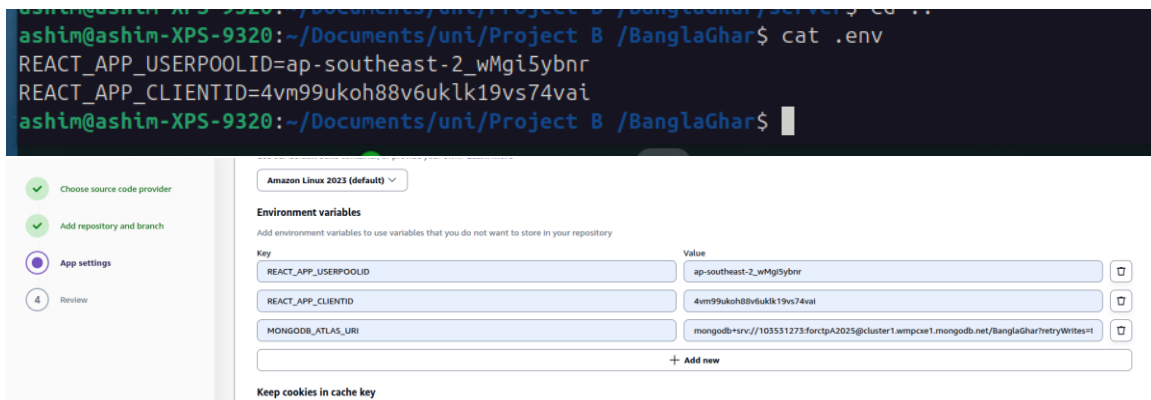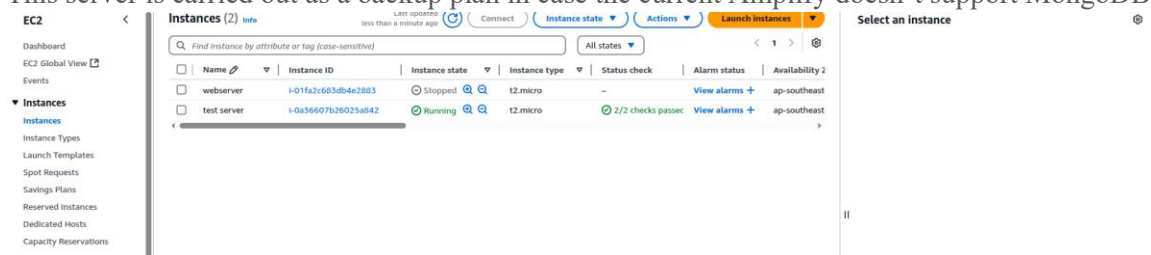
- Description of the demonstration session outlining the facilitation process to indicate that professional conduct was displayed in communication with the client

The demonstration session for the real estate development project was conducted with professionalism and client-centric communication. The facilitation process began with a warm welcome to the client, ensuring a comfortable and inclusive environment. A clear agenda was presented, outlining the objectives and scope of the demo, tailored to address the needs of root-level users of major cities of Bangladesh including Dhaka.

The session was structured to showcase the project's key features, using simple, jargon-free language to ensure accessibility for all attendees. Visual aids, including interactive features ongoing developing website and were employed to illustrate the platform's functionality, emphasizing ease of use for Bangladesh's grassroots users. We actively listened to client feedback, responding to questions with clarity and patience, while encouraging open dialogue to foster trust and collaboration.

Professional conduct was maintained throughout, with respectful tone, timely responses, and a focus on aligning the demonstration with the client's vision. The session concluded with a summary of key points, next steps, and an invitation for further input, ensuring the client felt valued and engaged.

- Feedback received from the client on the deliverable (must indicate if the increment was deliverable or not)

The client provided constructive feedback regarding the deliverable status of the increment presented during the demonstration session. The increment was deemed not fully deliverable due to the split demonstration of website features, resulting from the team working on separate branches without successful merging into the master branch. This led to conflicts and errors that prevented a cohesive showcase. The client noted, however, that the increment would have been considered deliverable had the demonstration been conducted from a single master branch with fully merged code. To address this, the team will prioritize resolving merge conflicts and establishing a

streamlined integration process for future sprints to ensure a unified and functional deliverable.

Additional Feedback

The client expressed appreciation for several features showcased during the session, including the multifactor OTP feature for signup and forgot password, which was highlighted for enhancing security and user trust. The dual-language setup was well-received for its accessibility, catering effectively to Bangladesh's root-level users. The functionality allowing users to upload properties was also praised for its user-friendly design. However, the client provided specific suggestions for improvement. While the AI-generated property descriptions linked to uploads were functional, the client emphasized the need for descriptions to be more tailored and pitched to resonate with Bengali users, reflecting local preferences and cultural nuances. Additionally, the client requested the inclusion of a feature to display uploaded properties in the user's profile history, enabling better tracking and engagement. These insights will guide the team in refining the platform's features to align closely with the client's vision and user expectations in the upcoming sprint.

- A critical analysis of progress against the plans, particular progress achieved, challenges faced etc. for the deliverable]

5. RETROSPECT (CRITICAL REVIEW OF THE PROCESS) - ASHIM & SHIVAM

[This should present a summary on how the overall team process was followed. Challenges, bottlenecks found during the sprint, how dealt with etc. and review of team code of conduct. The student teams are requested to review relevant cybersecurity and ethical protocols (for example, Australian Privacy Principles) for any data collection, any development, and/or testing that is planned or being done as part of the project.]

Throughout the project, our team followed an agile development process, organizing our work into weekly sprints and using JIRA for task management and sprint tracking. Regular stand-up meetings were held to discuss progress, identify blockers, and reassign tasks as needed. AWS was used as our cloud platform for hosting and deploying various components of the project, enabling scalable infrastructure and efficient testing environments. Git was used for version control, with team members pushing commits consistently and using pull requests to ensure transparency and maintain code quality.

Several challenges arose during the sprint, including scope creep due to evolving feature requests, which affected our timelines. We addressed this by refining the backlog in JIRA and setting clearer boundaries on sprint deliverables. Technical bottlenecks also emerged, especially during the integration of secure authentication mechanisms and real-time updates using AWS services, which initially caused latency and permission issues. These were resolved through collaborative debugging, adjusting AWS IAM roles, and optimizing resource configurations. Miscommunications about task responsibilities were mitigated through daily check-ins and improved documentation in JIRA and Git commit messages.

The team upheld a strong code of conduct, fostering mutual respect, accountability, and inclusive collaboration. Constructive feedback was shared during code reviews, and any conflicts were resolved through open discussion, supported by the team lead when necessary.

In terms of cybersecurity and ethics, we reviewed and adhered to the Australian Privacy Principles (APPs), ensuring that any data collected during development or testing was minimal, anonymized, and used with consent where required. AWS's security features, such as data encryption, IAM policies, and secure APIs, were leveraged to safeguard user information. The team also implemented role-based access controls and input validation to enhance security. All testing was conducted using synthetic or anonymized data to maintain compliance with privacy standards. Additionally, we followed best practices outlined in the OWASP Top 10 to ensure our development was secure and ethically sound throughout the project lifecycle.

6. LESSONS LEARNED (CRITICAL REVIEW OF SPRINT ONE EXPERIENCE AND FUTURE PLAN) - SHIVAM

[Add a list of lessons learned from working together on the project in this sprint. List a clear set of to do/recommendation for improvement in the future sprints. Please note this should not be generic – it should be specific to this sprint.]

Sprint 2 focused on major **feature enhancements**, including **AI-generated property descriptions, OTP verification, full website translation to Bangla, and backend integration for property uploads**. While these features were implemented successfully, **some technical and user experience issues emerged**, requiring further refinement.

1. Critical Analysis of Sprint 2 Progress

1.1 AI-Generated Property Descriptions: Functional but Needs Contextual Improvement

The AI-generated property description feature was implemented to **automate listing creation**, making it easier for users to post properties with detailed descriptions.

Key Achievements:

- Successfully generated **automated property descriptions** based on user inputs.

- Connected the AI feature with the backend database, allowing **storage and retrieval** of descriptions.

Challenges Faced:

- **Descriptions lacked contextual relevance** for Bangladeshi real estate, often appearing **too generic or repetitive**.

- Users had **limited control** over descriptions, leading to **some inaccurate listings**.

Sprint 3 Action Plan:

- Introduce **extra input fields** during property uploads to improve AI-generated content.

- Implement **dual-language descriptions (English & Bangla)** to support user preferences.

1.2 OTP Verification: Enhanced Security but Reliability Issues Remain

OTP-based authentication was added to **strengthen user security** and **prevent fake registrations**.

Key Achievements:

- Successfully integrated OTP verification for **login and new user registrations**.

- Improved **account security**, reducing unauthorized access attempts.

Challenges Faced:

- **High OTP request load** occasionally slowed the system.

Sprint 3 Action Plan:

- Optimize **OTP delivery mechanisms** to ensure faster response times.

- Implement a **resend OTP feature with cooldown** to prevent abuse.

- Conduct **load testing** to ensure OTP verification works efficiently under heavy traffic.

1.3 Website Translation to Bangla: Functional but UI Adjustments Needed

One of the key improvements in Sprint 2 was **translating the website to Bangla** for local user accessibility.

Key Achievements:

- Successfully **translated the entire website** into **Bangla**.

- Implemented **language toggle functionality**, allowing users to switch between **English & Bangla**.

Challenges Faced:

- **UI formatting issues**: Bangla text **did not align properly** in certain sections.

- **Terminology inconsistencies**: Some translations **were not culturally appropriate**, making them confusing for users.

Sprint 3 Action Plan:

- Implement **dual-language support for AI-generated descriptions** to match user-selected language.

- Adjust **UI layouts** to ensure Bangla text fits correctly on all screens.

- Conduct a **manual review of translations** by native Bangla speakers for linguistic accuracy.

1.4 Backend Property Upload Integration: Functional but Performance Optimizations Needed

Connecting property uploads to the **backend database** was a crucial feature added in Sprint 2.

Key Achievements:

- Fully **integrated property listings with the database**, allowing users to store and manage listings.

- Enabled **image uploads**, improving the visual representation of properties.

Sprint 3 Action Plan:

- Implement **image compression & format validation** to reduce failures.

- Optimize **database queries & indexing** to improve retrieval speeds.

- Introduce **bulk property upload** for real estate agents to streamline listing management.

2. Sprint 3 Focus: Finalizing Development & Preparing for Bug Testing

With **Sprint 3 set as the final development sprint**, the focus will be on:

1. **Refining AI-generated descriptions** by adding user-controlled input fields.

2. **Optimizing OTP verification** to reduce delays and improve reliability.

3. **Finalizing dual-language support** with proper UI formatting & terminology fixes.

4. **Enhancing backend performance** for faster property listing retrieval.

By the **end of Sprint 3**, the goal is to have a **fully developed, functional, and user-ready website** that can transition into **bug testing & quality assurance** in the next phase.