Curtis Slone

Accommodation Reservation Manager Software Design Document

Date: 25 July 2024

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[**1**](https://d2l-docbuilder-prod-us-east-1-converted.s3.amazonaws.com/4e61aee2-c54c-405d-87fb-a942d88746fc/295e706cefd64c207e6f06b8c5c4a661.html?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=ASIA5AF533RD6O7H2VEU%2F20240613%2Fus-east-1%2Fs3%2Faws4_request&X-Amz-Date=20240613T071716Z&X-Amz-Expires=5460&X-Amz-Security-Token=IQoJb3JpZ2luX2VjEPD%2F%2F%2F%2F%2F%2F%2F%2F%2F%2FwEaCXVzLWVhc3QtMSJHMEUCIGS%2F0fRhQiLwfwriFVEKza33Qhmx8SIAnzUCW%2B3aMhr8AiEA5Hy33F%2Beyib28TSErrhxRvuEpWxSuG%2BMbXgOSPnSjOAqiAQIiP%2F%2F%2F%2F%2F%2F%2F%2F%2F%2FARAEGgw4OTM3NTEzODUxNTkiDBiGqLmi38%2BzYpzWrCrcA%2BF9oVDoSiNfGjMux0l7BtAkyJQ8tvgbbltyzVymRBWozi8I9ssfMsNBHb5qLTeviJbvwMcVSvd1uRAcJxszHXr7IL%2F2GVNoDBfqfu%2FIf%2Fc%2FYwtlSdogpf7V6yaoVG%2Bb7DIJqkJGj6Uv4cVrqlMd%2BJY7VKRk%2BCIlj8F8%2BjDG2V9j9xy8MP1DWoH8aVqiGEF3QsUOgVP4sGSphDJP7YSSdkb7AQEj17rVODI%2FUlQvKI5a7a0t3Ao8QnJlsgltYUnmHCGbYhRYTT6X0ZW5TBGyccHlJV1dJteV6i28YMT97RC49ohCor%2F%2BZsrfYyijel1JBlRJuOZLOjRhDVvB0XEMJxgkzuJz8%2FIeHl6gRFshkeKSWYsZ1aDa04pdJzNVFRUzLukm2xvEDFo38DjxXliaL7PfKfAo%2FR2eEg6fMbqaxAxRh1jPuv4fLuvoKqkYwPEoAEovisKzo3qT%2F0rb7LJq%2Fu%2Ft6O0MLEfTByiqlfrv3l%2FIr3ZGueACUpRXgd%2FXrjZSx%2F%2BizgrZ6V8gQ4mH9NFLjwOB0U2RDy3EKFdxGfSlPeTeetLovNV225cnwcmx0ono2UXW4vynXq9Wp%2BlkxhDWNXvuOjSvQoUDB31xDp9pE%2BtLAsaSxMYrnbvQgarhMIW5qrMGOqUB0k6%2FKxlYIvKjCzSNPdZftI8dDZ7I7NFGXVhT0I80FXtB8fhKvi6VWxcIbCs1Zmn8O9zbb%2F7kTO2Fd%2Fi03DWZRVppcWa4mxGujcUu7SbAbQzKRrkqZbeKPt%2Bw5uMx%2BkBrnI3pEUpgJqsMljVVHyiyec%2Fs0MRZnTsGBQ47u5uX%2B0NihO4NVkGysx4Fz5uwrHi4O4%2Fm5mhk1U5SJtLddT5vJ2kxBkyL&X-Amz-Signature=71ffb3c0d3031bc7970fd6f43bcfbfd2a5440c617aa9d7f3a520eb0f352717c3&X-Amz-SignedHeaders=host#_Toc483484767) **INTRODUCTION**

[**1.1**](https://d2l-docbuilder-prod-us-east-1-converted.s3.amazonaws.com/4e61aee2-c54c-405d-87fb-a942d88746fc/295e706cefd64c207e6f06b8c5c4a661.html?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=ASIA5AF533RD6O7H2VEU%2F20240613%2Fus-east-1%2Fs3%2Faws4_request&X-Amz-Date=20240613T071716Z&X-Amz-Expires=5460&X-Amz-Security-Token=IQoJb3JpZ2luX2VjEPD%2F%2F%2F%2F%2F%2F%2F%2F%2F%2FwEaCXVzLWVhc3QtMSJHMEUCIGS%2F0fRhQiLwfwriFVEKza33Qhmx8SIAnzUCW%2B3aMhr8AiEA5Hy33F%2Beyib28TSErrhxRvuEpWxSuG%2BMbXgOSPnSjOAqiAQIiP%2F%2F%2F%2F%2F%2F%2F%2F%2F%2FARAEGgw4OTM3NTEzODUxNTkiDBiGqLmi38%2BzYpzWrCrcA%2BF9oVDoSiNfGjMux0l7BtAkyJQ8tvgbbltyzVymRBWozi8I9ssfMsNBHb5qLTeviJbvwMcVSvd1uRAcJxszHXr7IL%2F2GVNoDBfqfu%2FIf%2Fc%2FYwtlSdogpf7V6yaoVG%2Bb7DIJqkJGj6Uv4cVrqlMd%2BJY7VKRk%2BCIlj8F8%2BjDG2V9j9xy8MP1DWoH8aVqiGEF3QsUOgVP4sGSphDJP7YSSdkb7AQEj17rVODI%2FUlQvKI5a7a0t3Ao8QnJlsgltYUnmHCGbYhRYTT6X0ZW5TBGyccHlJV1dJteV6i28YMT97RC49ohCor%2F%2BZsrfYyijel1JBlRJuOZLOjRhDVvB0XEMJxgkzuJz8%2FIeHl6gRFshkeKSWYsZ1aDa04pdJzNVFRUzLukm2xvEDFo38DjxXliaL7PfKfAo%2FR2eEg6fMbqaxAxRh1jPuv4fLuvoKqkYwPEoAEovisKzo3qT%2F0rb7LJq%2Fu%2Ft6O0MLEfTByiqlfrv3l%2FIr3ZGueACUpRXgd%2FXrjZSx%2F%2BizgrZ6V8gQ4mH9NFLjwOB0U2RDy3EKFdxGfSlPeTeetLovNV225cnwcmx0ono2UXW4vynXq9Wp%2BlkxhDWNXvuOjSvQoUDB31xDp9pE%2BtLAsaSxMYrnbvQgarhMIW5qrMGOqUB0k6%2FKxlYIvKjCzSNPdZftI8dDZ7I7NFGXVhT0I80FXtB8fhKvi6VWxcIbCs1Zmn8O9zbb%2F7kTO2Fd%2Fi03DWZRVppcWa4mxGujcUu7SbAbQzKRrkqZbeKPt%2Bw5uMx%2BkBrnI3pEUpgJqsMljVVHyiyec%2Fs0MRZnTsGBQ47u5uX%2B0NihO4NVkGysx4Fz5uwrHi4O4%2Fm5mhk1U5SJtLddT5vJ2kxBkyL&X-Amz-Signature=71ffb3c0d3031bc7970fd6f43bcfbfd2a5440c617aa9d7f3a520eb0f352717c3&X-Amz-SignedHeaders=host#_Toc483484768) **Purpose**

[**1.2**](https://d2l-docbuilder-prod-us-east-1-converted.s3.amazonaws.com/4e61aee2-c54c-405d-87fb-a942d88746fc/295e706cefd64c207e6f06b8c5c4a661.html?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=ASIA5AF533RD6O7H2VEU%2F20240613%2Fus-east-1%2Fs3%2Faws4_request&X-Amz-Date=20240613T071716Z&X-Amz-Expires=5460&X-Amz-Security-Token=IQoJb3JpZ2luX2VjEPD%2F%2F%2F%2F%2F%2F%2F%2F%2F%2FwEaCXVzLWVhc3QtMSJHMEUCIGS%2F0fRhQiLwfwriFVEKza33Qhmx8SIAnzUCW%2B3aMhr8AiEA5Hy33F%2Beyib28TSErrhxRvuEpWxSuG%2BMbXgOSPnSjOAqiAQIiP%2F%2F%2F%2F%2F%2F%2F%2F%2F%2FARAEGgw4OTM3NTEzODUxNTkiDBiGqLmi38%2BzYpzWrCrcA%2BF9oVDoSiNfGjMux0l7BtAkyJQ8tvgbbltyzVymRBWozi8I9ssfMsNBHb5qLTeviJbvwMcVSvd1uRAcJxszHXr7IL%2F2GVNoDBfqfu%2FIf%2Fc%2FYwtlSdogpf7V6yaoVG%2Bb7DIJqkJGj6Uv4cVrqlMd%2BJY7VKRk%2BCIlj8F8%2BjDG2V9j9xy8MP1DWoH8aVqiGEF3QsUOgVP4sGSphDJP7YSSdkb7AQEj17rVODI%2FUlQvKI5a7a0t3Ao8QnJlsgltYUnmHCGbYhRYTT6X0ZW5TBGyccHlJV1dJteV6i28YMT97RC49ohCor%2F%2BZsrfYyijel1JBlRJuOZLOjRhDVvB0XEMJxgkzuJz8%2FIeHl6gRFshkeKSWYsZ1aDa04pdJzNVFRUzLukm2xvEDFo38DjxXliaL7PfKfAo%2FR2eEg6fMbqaxAxRh1jPuv4fLuvoKqkYwPEoAEovisKzo3qT%2F0rb7LJq%2Fu%2Ft6O0MLEfTByiqlfrv3l%2FIr3ZGueACUpRXgd%2FXrjZSx%2F%2BizgrZ6V8gQ4mH9NFLjwOB0U2RDy3EKFdxGfSlPeTeetLovNV225cnwcmx0ono2UXW4vynXq9Wp%2BlkxhDWNXvuOjSvQoUDB31xDp9pE%2BtLAsaSxMYrnbvQgarhMIW5qrMGOqUB0k6%2FKxlYIvKjCzSNPdZftI8dDZ7I7NFGXVhT0I80FXtB8fhKvi6VWxcIbCs1Zmn8O9zbb%2F7kTO2Fd%2Fi03DWZRVppcWa4mxGujcUu7SbAbQzKRrkqZbeKPt%2Bw5uMx%2BkBrnI3pEUpgJqsMljVVHyiyec%2Fs0MRZnTsGBQ47u5uX%2B0NihO4NVkGysx4Fz5uwrHi4O4%2Fm5mhk1U5SJtLddT5vJ2kxBkyL&X-Amz-Signature=71ffb3c0d3031bc7970fd6f43bcfbfd2a5440c617aa9d7f3a520eb0f352717c3&X-Amz-SignedHeaders=host#_Toc483484769) **Scope**

[**1.3**](https://d2l-docbuilder-prod-us-east-1-converted.s3.amazonaws.com/4e61aee2-c54c-405d-87fb-a942d88746fc/295e706cefd64c207e6f06b8c5c4a661.html?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=ASIA5AF533RD6O7H2VEU%2F20240613%2Fus-east-1%2Fs3%2Faws4_request&X-Amz-Date=20240613T071716Z&X-Amz-Expires=5460&X-Amz-Security-Token=IQoJb3JpZ2luX2VjEPD%2F%2F%2F%2F%2F%2F%2F%2F%2F%2FwEaCXVzLWVhc3QtMSJHMEUCIGS%2F0fRhQiLwfwriFVEKza33Qhmx8SIAnzUCW%2B3aMhr8AiEA5Hy33F%2Beyib28TSErrhxRvuEpWxSuG%2BMbXgOSPnSjOAqiAQIiP%2F%2F%2F%2F%2F%2F%2F%2F%2F%2FARAEGgw4OTM3NTEzODUxNTkiDBiGqLmi38%2BzYpzWrCrcA%2BF9oVDoSiNfGjMux0l7BtAkyJQ8tvgbbltyzVymRBWozi8I9ssfMsNBHb5qLTeviJbvwMcVSvd1uRAcJxszHXr7IL%2F2GVNoDBfqfu%2FIf%2Fc%2FYwtlSdogpf7V6yaoVG%2Bb7DIJqkJGj6Uv4cVrqlMd%2BJY7VKRk%2BCIlj8F8%2BjDG2V9j9xy8MP1DWoH8aVqiGEF3QsUOgVP4sGSphDJP7YSSdkb7AQEj17rVODI%2FUlQvKI5a7a0t3Ao8QnJlsgltYUnmHCGbYhRYTT6X0ZW5TBGyccHlJV1dJteV6i28YMT97RC49ohCor%2F%2BZsrfYyijel1JBlRJuOZLOjRhDVvB0XEMJxgkzuJz8%2FIeHl6gRFshkeKSWYsZ1aDa04pdJzNVFRUzLukm2xvEDFo38DjxXliaL7PfKfAo%2FR2eEg6fMbqaxAxRh1jPuv4fLuvoKqkYwPEoAEovisKzo3qT%2F0rb7LJq%2Fu%2Ft6O0MLEfTByiqlfrv3l%2FIr3ZGueACUpRXgd%2FXrjZSx%2F%2BizgrZ6V8gQ4mH9NFLjwOB0U2RDy3EKFdxGfSlPeTeetLovNV225cnwcmx0ono2UXW4vynXq9Wp%2BlkxhDWNXvuOjSvQoUDB31xDp9pE%2BtLAsaSxMYrnbvQgarhMIW5qrMGOqUB0k6%2FKxlYIvKjCzSNPdZftI8dDZ7I7NFGXVhT0I80FXtB8fhKvi6VWxcIbCs1Zmn8O9zbb%2F7kTO2Fd%2Fi03DWZRVppcWa4mxGujcUu7SbAbQzKRrkqZbeKPt%2Bw5uMx%2BkBrnI3pEUpgJqsMljVVHyiyec%2Fs0MRZnTsGBQ47u5uX%2B0NihO4NVkGysx4Fz5uwrHi4O4%2Fm5mhk1U5SJtLddT5vJ2kxBkyL&X-Amz-Signature=71ffb3c0d3031bc7970fd6f43bcfbfd2a5440c617aa9d7f3a520eb0f352717c3&X-Amz-SignedHeaders=host#_Toc483484770) **Overview**

[**2**](https://d2l-docbuilder-prod-us-east-1-converted.s3.amazonaws.com/4e61aee2-c54c-405d-87fb-a942d88746fc/295e706cefd64c207e6f06b8c5c4a661.html?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=ASIA5AF533RD6O7H2VEU%2F20240613%2Fus-east-1%2Fs3%2Faws4_request&X-Amz-Date=20240613T071716Z&X-Amz-Expires=5460&X-Amz-Security-Token=IQoJb3JpZ2luX2VjEPD%2F%2F%2F%2F%2F%2F%2F%2F%2F%2FwEaCXVzLWVhc3QtMSJHMEUCIGS%2F0fRhQiLwfwriFVEKza33Qhmx8SIAnzUCW%2B3aMhr8AiEA5Hy33F%2Beyib28TSErrhxRvuEpWxSuG%2BMbXgOSPnSjOAqiAQIiP%2F%2F%2F%2F%2F%2F%2F%2F%2F%2FARAEGgw4OTM3NTEzODUxNTkiDBiGqLmi38%2BzYpzWrCrcA%2BF9oVDoSiNfGjMux0l7BtAkyJQ8tvgbbltyzVymRBWozi8I9ssfMsNBHb5qLTeviJbvwMcVSvd1uRAcJxszHXr7IL%2F2GVNoDBfqfu%2FIf%2Fc%2FYwtlSdogpf7V6yaoVG%2Bb7DIJqkJGj6Uv4cVrqlMd%2BJY7VKRk%2BCIlj8F8%2BjDG2V9j9xy8MP1DWoH8aVqiGEF3QsUOgVP4sGSphDJP7YSSdkb7AQEj17rVODI%2FUlQvKI5a7a0t3Ao8QnJlsgltYUnmHCGbYhRYTT6X0ZW5TBGyccHlJV1dJteV6i28YMT97RC49ohCor%2F%2BZsrfYyijel1JBlRJuOZLOjRhDVvB0XEMJxgkzuJz8%2FIeHl6gRFshkeKSWYsZ1aDa04pdJzNVFRUzLukm2xvEDFo38DjxXliaL7PfKfAo%2FR2eEg6fMbqaxAxRh1jPuv4fLuvoKqkYwPEoAEovisKzo3qT%2F0rb7LJq%2Fu%2Ft6O0MLEfTByiqlfrv3l%2FIr3ZGueACUpRXgd%2FXrjZSx%2F%2BizgrZ6V8gQ4mH9NFLjwOB0U2RDy3EKFdxGfSlPeTeetLovNV225cnwcmx0ono2UXW4vynXq9Wp%2BlkxhDWNXvuOjSvQoUDB31xDp9pE%2BtLAsaSxMYrnbvQgarhMIW5qrMGOqUB0k6%2FKxlYIvKjCzSNPdZftI8dDZ7I7NFGXVhT0I80FXtB8fhKvi6VWxcIbCs1Zmn8O9zbb%2F7kTO2Fd%2Fi03DWZRVppcWa4mxGujcUu7SbAbQzKRrkqZbeKPt%2Bw5uMx%2BkBrnI3pEUpgJqsMljVVHyiyec%2Fs0MRZnTsGBQ47u5uX%2B0NihO4NVkGysx4Fz5uwrHi4O4%2Fm5mhk1U5SJtLddT5vJ2kxBkyL&X-Amz-Signature=71ffb3c0d3031bc7970fd6f43bcfbfd2a5440c617aa9d7f3a520eb0f352717c3&X-Amz-SignedHeaders=host#_Toc483484773) **SYSTEM OVERVIEW**

[**3**](https://d2l-docbuilder-prod-us-east-1-converted.s3.amazonaws.com/4e61aee2-c54c-405d-87fb-a942d88746fc/295e706cefd64c207e6f06b8c5c4a661.html?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=ASIA5AF533RD6O7H2VEU%2F20240613%2Fus-east-1%2Fs3%2Faws4_request&X-Amz-Date=20240613T071716Z&X-Amz-Expires=5460&X-Amz-Security-Token=IQoJb3JpZ2luX2VjEPD%2F%2F%2F%2F%2F%2F%2F%2F%2F%2FwEaCXVzLWVhc3QtMSJHMEUCIGS%2F0fRhQiLwfwriFVEKza33Qhmx8SIAnzUCW%2B3aMhr8AiEA5Hy33F%2Beyib28TSErrhxRvuEpWxSuG%2BMbXgOSPnSjOAqiAQIiP%2F%2F%2F%2F%2F%2F%2F%2F%2F%2FARAEGgw4OTM3NTEzODUxNTkiDBiGqLmi38%2BzYpzWrCrcA%2BF9oVDoSiNfGjMux0l7BtAkyJQ8tvgbbltyzVymRBWozi8I9ssfMsNBHb5qLTeviJbvwMcVSvd1uRAcJxszHXr7IL%2F2GVNoDBfqfu%2FIf%2Fc%2FYwtlSdogpf7V6yaoVG%2Bb7DIJqkJGj6Uv4cVrqlMd%2BJY7VKRk%2BCIlj8F8%2BjDG2V9j9xy8MP1DWoH8aVqiGEF3QsUOgVP4sGSphDJP7YSSdkb7AQEj17rVODI%2FUlQvKI5a7a0t3Ao8QnJlsgltYUnmHCGbYhRYTT6X0ZW5TBGyccHlJV1dJteV6i28YMT97RC49ohCor%2F%2BZsrfYyijel1JBlRJuOZLOjRhDVvB0XEMJxgkzuJz8%2FIeHl6gRFshkeKSWYsZ1aDa04pdJzNVFRUzLukm2xvEDFo38DjxXliaL7PfKfAo%2FR2eEg6fMbqaxAxRh1jPuv4fLuvoKqkYwPEoAEovisKzo3qT%2F0rb7LJq%2Fu%2Ft6O0MLEfTByiqlfrv3l%2FIr3ZGueACUpRXgd%2FXrjZSx%2F%2BizgrZ6V8gQ4mH9NFLjwOB0U2RDy3EKFdxGfSlPeTeetLovNV225cnwcmx0ono2UXW4vynXq9Wp%2BlkxhDWNXvuOjSvQoUDB31xDp9pE%2BtLAsaSxMYrnbvQgarhMIW5qrMGOqUB0k6%2FKxlYIvKjCzSNPdZftI8dDZ7I7NFGXVhT0I80FXtB8fhKvi6VWxcIbCs1Zmn8O9zbb%2F7kTO2Fd%2Fi03DWZRVppcWa4mxGujcUu7SbAbQzKRrkqZbeKPt%2Bw5uMx%2BkBrnI3pEUpgJqsMljVVHyiyec%2Fs0MRZnTsGBQ47u5uX%2B0NihO4NVkGysx4Fz5uwrHi4O4%2Fm5mhk1U5SJtLddT5vJ2kxBkyL&X-Amz-Signature=71ffb3c0d3031bc7970fd6f43bcfbfd2a5440c617aa9d7f3a520eb0f352717c3&X-Amz-SignedHeaders=host#_Toc483484774) **SYSTEM ARCHITECTURE**

[**3.1**](https://d2l-docbuilder-prod-us-east-1-converted.s3.amazonaws.com/4e61aee2-c54c-405d-87fb-a942d88746fc/295e706cefd64c207e6f06b8c5c4a661.html?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=ASIA5AF533RD6O7H2VEU%2F20240613%2Fus-east-1%2Fs3%2Faws4_request&X-Amz-Date=20240613T071716Z&X-Amz-Expires=5460&X-Amz-Security-Token=IQoJb3JpZ2luX2VjEPD%2F%2F%2F%2F%2F%2F%2F%2F%2F%2FwEaCXVzLWVhc3QtMSJHMEUCIGS%2F0fRhQiLwfwriFVEKza33Qhmx8SIAnzUCW%2B3aMhr8AiEA5Hy33F%2Beyib28TSErrhxRvuEpWxSuG%2BMbXgOSPnSjOAqiAQIiP%2F%2F%2F%2F%2F%2F%2F%2F%2F%2FARAEGgw4OTM3NTEzODUxNTkiDBiGqLmi38%2BzYpzWrCrcA%2BF9oVDoSiNfGjMux0l7BtAkyJQ8tvgbbltyzVymRBWozi8I9ssfMsNBHb5qLTeviJbvwMcVSvd1uRAcJxszHXr7IL%2F2GVNoDBfqfu%2FIf%2Fc%2FYwtlSdogpf7V6yaoVG%2Bb7DIJqkJGj6Uv4cVrqlMd%2BJY7VKRk%2BCIlj8F8%2BjDG2V9j9xy8MP1DWoH8aVqiGEF3QsUOgVP4sGSphDJP7YSSdkb7AQEj17rVODI%2FUlQvKI5a7a0t3Ao8QnJlsgltYUnmHCGbYhRYTT6X0ZW5TBGyccHlJV1dJteV6i28YMT97RC49ohCor%2F%2BZsrfYyijel1JBlRJuOZLOjRhDVvB0XEMJxgkzuJz8%2FIeHl6gRFshkeKSWYsZ1aDa04pdJzNVFRUzLukm2xvEDFo38DjxXliaL7PfKfAo%2FR2eEg6fMbqaxAxRh1jPuv4fLuvoKqkYwPEoAEovisKzo3qT%2F0rb7LJq%2Fu%2Ft6O0MLEfTByiqlfrv3l%2FIr3ZGueACUpRXgd%2FXrjZSx%2F%2BizgrZ6V8gQ4mH9NFLjwOB0U2RDy3EKFdxGfSlPeTeetLovNV225cnwcmx0ono2UXW4vynXq9Wp%2BlkxhDWNXvuOjSvQoUDB31xDp9pE%2BtLAsaSxMYrnbvQgarhMIW5qrMGOqUB0k6%2FKxlYIvKjCzSNPdZftI8dDZ7I7NFGXVhT0I80FXtB8fhKvi6VWxcIbCs1Zmn8O9zbb%2F7kTO2Fd%2Fi03DWZRVppcWa4mxGujcUu7SbAbQzKRrkqZbeKPt%2Bw5uMx%2BkBrnI3pEUpgJqsMljVVHyiyec%2Fs0MRZnTsGBQ47u5uX%2B0NihO4NVkGysx4Fz5uwrHi4O4%2Fm5mhk1U5SJtLddT5vJ2kxBkyL&X-Amz-Signature=71ffb3c0d3031bc7970fd6f43bcfbfd2a5440c617aa9d7f3a520eb0f352717c3&X-Amz-SignedHeaders=host#_Toc483484775) **Architectural Design**

[**3.2**](https://d2l-docbuilder-prod-us-east-1-converted.s3.amazonaws.com/4e61aee2-c54c-405d-87fb-a942d88746fc/295e706cefd64c207e6f06b8c5c4a661.html?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=ASIA5AF533RD6O7H2VEU%2F20240613%2Fus-east-1%2Fs3%2Faws4_request&X-Amz-Date=20240613T071716Z&X-Amz-Expires=5460&X-Amz-Security-Token=IQoJb3JpZ2luX2VjEPD%2F%2F%2F%2F%2F%2F%2F%2F%2F%2FwEaCXVzLWVhc3QtMSJHMEUCIGS%2F0fRhQiLwfwriFVEKza33Qhmx8SIAnzUCW%2B3aMhr8AiEA5Hy33F%2Beyib28TSErrhxRvuEpWxSuG%2BMbXgOSPnSjOAqiAQIiP%2F%2F%2F%2F%2F%2F%2F%2F%2F%2FARAEGgw4OTM3NTEzODUxNTkiDBiGqLmi38%2BzYpzWrCrcA%2BF9oVDoSiNfGjMux0l7BtAkyJQ8tvgbbltyzVymRBWozi8I9ssfMsNBHb5qLTeviJbvwMcVSvd1uRAcJxszHXr7IL%2F2GVNoDBfqfu%2FIf%2Fc%2FYwtlSdogpf7V6yaoVG%2Bb7DIJqkJGj6Uv4cVrqlMd%2BJY7VKRk%2BCIlj8F8%2BjDG2V9j9xy8MP1DWoH8aVqiGEF3QsUOgVP4sGSphDJP7YSSdkb7AQEj17rVODI%2FUlQvKI5a7a0t3Ao8QnJlsgltYUnmHCGbYhRYTT6X0ZW5TBGyccHlJV1dJteV6i28YMT97RC49ohCor%2F%2BZsrfYyijel1JBlRJuOZLOjRhDVvB0XEMJxgkzuJz8%2FIeHl6gRFshkeKSWYsZ1aDa04pdJzNVFRUzLukm2xvEDFo38DjxXliaL7PfKfAo%2FR2eEg6fMbqaxAxRh1jPuv4fLuvoKqkYwPEoAEovisKzo3qT%2F0rb7LJq%2Fu%2Ft6O0MLEfTByiqlfrv3l%2FIr3ZGueACUpRXgd%2FXrjZSx%2F%2BizgrZ6V8gQ4mH9NFLjwOB0U2RDy3EKFdxGfSlPeTeetLovNV225cnwcmx0ono2UXW4vynXq9Wp%2BlkxhDWNXvuOjSvQoUDB31xDp9pE%2BtLAsaSxMYrnbvQgarhMIW5qrMGOqUB0k6%2FKxlYIvKjCzSNPdZftI8dDZ7I7NFGXVhT0I80FXtB8fhKvi6VWxcIbCs1Zmn8O9zbb%2F7kTO2Fd%2Fi03DWZRVppcWa4mxGujcUu7SbAbQzKRrkqZbeKPt%2Bw5uMx%2BkBrnI3pEUpgJqsMljVVHyiyec%2Fs0MRZnTsGBQ47u5uX%2B0NihO4NVkGysx4Fz5uwrHi4O4%2Fm5mhk1U5SJtLddT5vJ2kxBkyL&X-Amz-Signature=71ffb3c0d3031bc7970fd6f43bcfbfd2a5440c617aa9d7f3a520eb0f352717c3&X-Amz-SignedHeaders=host#_Toc483484776) **Decomposition Description**

[**3.3**](https://d2l-docbuilder-prod-us-east-1-converted.s3.amazonaws.com/4e61aee2-c54c-405d-87fb-a942d88746fc/295e706cefd64c207e6f06b8c5c4a661.html?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=ASIA5AF533RD6O7H2VEU%2F20240613%2Fus-east-1%2Fs3%2Faws4_request&X-Amz-Date=20240613T071716Z&X-Amz-Expires=5460&X-Amz-Security-Token=IQoJb3JpZ2luX2VjEPD%2F%2F%2F%2F%2F%2F%2F%2F%2F%2FwEaCXVzLWVhc3QtMSJHMEUCIGS%2F0fRhQiLwfwriFVEKza33Qhmx8SIAnzUCW%2B3aMhr8AiEA5Hy33F%2Beyib28TSErrhxRvuEpWxSuG%2BMbXgOSPnSjOAqiAQIiP%2F%2F%2F%2F%2F%2F%2F%2F%2F%2FARAEGgw4OTM3NTEzODUxNTkiDBiGqLmi38%2BzYpzWrCrcA%2BF9oVDoSiNfGjMux0l7BtAkyJQ8tvgbbltyzVymRBWozi8I9ssfMsNBHb5qLTeviJbvwMcVSvd1uRAcJxszHXr7IL%2F2GVNoDBfqfu%2FIf%2Fc%2FYwtlSdogpf7V6yaoVG%2Bb7DIJqkJGj6Uv4cVrqlMd%2BJY7VKRk%2BCIlj8F8%2BjDG2V9j9xy8MP1DWoH8aVqiGEF3QsUOgVP4sGSphDJP7YSSdkb7AQEj17rVODI%2FUlQvKI5a7a0t3Ao8QnJlsgltYUnmHCGbYhRYTT6X0ZW5TBGyccHlJV1dJteV6i28YMT97RC49ohCor%2F%2BZsrfYyijel1JBlRJuOZLOjRhDVvB0XEMJxgkzuJz8%2FIeHl6gRFshkeKSWYsZ1aDa04pdJzNVFRUzLukm2xvEDFo38DjxXliaL7PfKfAo%2FR2eEg6fMbqaxAxRh1jPuv4fLuvoKqkYwPEoAEovisKzo3qT%2F0rb7LJq%2Fu%2Ft6O0MLEfTByiqlfrv3l%2FIr3ZGueACUpRXgd%2FXrjZSx%2F%2BizgrZ6V8gQ4mH9NFLjwOB0U2RDy3EKFdxGfSlPeTeetLovNV225cnwcmx0ono2UXW4vynXq9Wp%2BlkxhDWNXvuOjSvQoUDB31xDp9pE%2BtLAsaSxMYrnbvQgarhMIW5qrMGOqUB0k6%2FKxlYIvKjCzSNPdZftI8dDZ7I7NFGXVhT0I80FXtB8fhKvi6VWxcIbCs1Zmn8O9zbb%2F7kTO2Fd%2Fi03DWZRVppcWa4mxGujcUu7SbAbQzKRrkqZbeKPt%2Bw5uMx%2BkBrnI3pEUpgJqsMljVVHyiyec%2Fs0MRZnTsGBQ47u5uX%2B0NihO4NVkGysx4Fz5uwrHi4O4%2Fm5mhk1U5SJtLddT5vJ2kxBkyL&X-Amz-Signature=71ffb3c0d3031bc7970fd6f43bcfbfd2a5440c617aa9d7f3a520eb0f352717c3&X-Amz-SignedHeaders=host#_Toc483484777) **Exception Handling**

[**3.4**](https://d2l-docbuilder-prod-us-east-1-converted.s3.amazonaws.com/4e61aee2-c54c-405d-87fb-a942d88746fc/295e706cefd64c207e6f06b8c5c4a661.html?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=ASIA5AF533RD6O7H2VEU%2F20240613%2Fus-east-1%2Fs3%2Faws4_request&X-Amz-Date=20240613T071716Z&X-Amz-Expires=5460&X-Amz-Security-Token=IQoJb3JpZ2luX2VjEPD%2F%2F%2F%2F%2F%2F%2F%2F%2F%2FwEaCXVzLWVhc3QtMSJHMEUCIGS%2F0fRhQiLwfwriFVEKza33Qhmx8SIAnzUCW%2B3aMhr8AiEA5Hy33F%2Beyib28TSErrhxRvuEpWxSuG%2BMbXgOSPnSjOAqiAQIiP%2F%2F%2F%2F%2F%2F%2F%2F%2F%2FARAEGgw4OTM3NTEzODUxNTkiDBiGqLmi38%2BzYpzWrCrcA%2BF9oVDoSiNfGjMux0l7BtAkyJQ8tvgbbltyzVymRBWozi8I9ssfMsNBHb5qLTeviJbvwMcVSvd1uRAcJxszHXr7IL%2F2GVNoDBfqfu%2FIf%2Fc%2FYwtlSdogpf7V6yaoVG%2Bb7DIJqkJGj6Uv4cVrqlMd%2BJY7VKRk%2BCIlj8F8%2BjDG2V9j9xy8MP1DWoH8aVqiGEF3QsUOgVP4sGSphDJP7YSSdkb7AQEj17rVODI%2FUlQvKI5a7a0t3Ao8QnJlsgltYUnmHCGbYhRYTT6X0ZW5TBGyccHlJV1dJteV6i28YMT97RC49ohCor%2F%2BZsrfYyijel1JBlRJuOZLOjRhDVvB0XEMJxgkzuJz8%2FIeHl6gRFshkeKSWYsZ1aDa04pdJzNVFRUzLukm2xvEDFo38DjxXliaL7PfKfAo%2FR2eEg6fMbqaxAxRh1jPuv4fLuvoKqkYwPEoAEovisKzo3qT%2F0rb7LJq%2Fu%2Ft6O0MLEfTByiqlfrv3l%2FIr3ZGueACUpRXgd%2FXrjZSx%2F%2BizgrZ6V8gQ4mH9NFLjwOB0U2RDy3EKFdxGfSlPeTeetLovNV225cnwcmx0ono2UXW4vynXq9Wp%2BlkxhDWNXvuOjSvQoUDB31xDp9pE%2BtLAsaSxMYrnbvQgarhMIW5qrMGOqUB0k6%2FKxlYIvKjCzSNPdZftI8dDZ7I7NFGXVhT0I80FXtB8fhKvi6VWxcIbCs1Zmn8O9zbb%2F7kTO2Fd%2Fi03DWZRVppcWa4mxGujcUu7SbAbQzKRrkqZbeKPt%2Bw5uMx%2BkBrnI3pEUpgJqsMljVVHyiyec%2Fs0MRZnTsGBQ47u5uX%2B0NihO4NVkGysx4Fz5uwrHi4O4%2Fm5mhk1U5SJtLddT5vJ2kxBkyL&X-Amz-Signature=71ffb3c0d3031bc7970fd6f43bcfbfd2a5440c617aa9d7f3a520eb0f352717c3&X-Amz-SignedHeaders=host#_Toc483484778) **Design Rationale**

[**4**](https://d2l-docbuilder-prod-us-east-1-converted.s3.amazonaws.com/4e61aee2-c54c-405d-87fb-a942d88746fc/295e706cefd64c207e6f06b8c5c4a661.html?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=ASIA5AF533RD6O7H2VEU%2F20240613%2Fus-east-1%2Fs3%2Faws4_request&X-Amz-Date=20240613T071716Z&X-Amz-Expires=5460&X-Amz-Security-Token=IQoJb3JpZ2luX2VjEPD%2F%2F%2F%2F%2F%2F%2F%2F%2F%2FwEaCXVzLWVhc3QtMSJHMEUCIGS%2F0fRhQiLwfwriFVEKza33Qhmx8SIAnzUCW%2B3aMhr8AiEA5Hy33F%2Beyib28TSErrhxRvuEpWxSuG%2BMbXgOSPnSjOAqiAQIiP%2F%2F%2F%2F%2F%2F%2F%2F%2F%2FARAEGgw4OTM3NTEzODUxNTkiDBiGqLmi38%2BzYpzWrCrcA%2BF9oVDoSiNfGjMux0l7BtAkyJQ8tvgbbltyzVymRBWozi8I9ssfMsNBHb5qLTeviJbvwMcVSvd1uRAcJxszHXr7IL%2F2GVNoDBfqfu%2FIf%2Fc%2FYwtlSdogpf7V6yaoVG%2Bb7DIJqkJGj6Uv4cVrqlMd%2BJY7VKRk%2BCIlj8F8%2BjDG2V9j9xy8MP1DWoH8aVqiGEF3QsUOgVP4sGSphDJP7YSSdkb7AQEj17rVODI%2FUlQvKI5a7a0t3Ao8QnJlsgltYUnmHCGbYhRYTT6X0ZW5TBGyccHlJV1dJteV6i28YMT97RC49ohCor%2F%2BZsrfYyijel1JBlRJuOZLOjRhDVvB0XEMJxgkzuJz8%2FIeHl6gRFshkeKSWYsZ1aDa04pdJzNVFRUzLukm2xvEDFo38DjxXliaL7PfKfAo%2FR2eEg6fMbqaxAxRh1jPuv4fLuvoKqkYwPEoAEovisKzo3qT%2F0rb7LJq%2Fu%2Ft6O0MLEfTByiqlfrv3l%2FIr3ZGueACUpRXgd%2FXrjZSx%2F%2BizgrZ6V8gQ4mH9NFLjwOB0U2RDy3EKFdxGfSlPeTeetLovNV225cnwcmx0ono2UXW4vynXq9Wp%2BlkxhDWNXvuOjSvQoUDB31xDp9pE%2BtLAsaSxMYrnbvQgarhMIW5qrMGOqUB0k6%2FKxlYIvKjCzSNPdZftI8dDZ7I7NFGXVhT0I80FXtB8fhKvi6VWxcIbCs1Zmn8O9zbb%2F7kTO2Fd%2Fi03DWZRVppcWa4mxGujcUu7SbAbQzKRrkqZbeKPt%2Bw5uMx%2BkBrnI3pEUpgJqsMljVVHyiyec%2Fs0MRZnTsGBQ47u5uX%2B0NihO4NVkGysx4Fz5uwrHi4O4%2Fm5mhk1U5SJtLddT5vJ2kxBkyL&X-Amz-Signature=71ffb3c0d3031bc7970fd6f43bcfbfd2a5440c617aa9d7f3a520eb0f352717c3&X-Amz-SignedHeaders=host#_Toc483484779) **DATA DESIGN**

[**4.1**](https://d2l-docbuilder-prod-us-east-1-converted.s3.amazonaws.com/4e61aee2-c54c-405d-87fb-a942d88746fc/295e706cefd64c207e6f06b8c5c4a661.html?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=ASIA5AF533RD6O7H2VEU%2F20240613%2Fus-east-1%2Fs3%2Faws4_request&X-Amz-Date=20240613T071716Z&X-Amz-Expires=5460&X-Amz-Security-Token=IQoJb3JpZ2luX2VjEPD%2F%2F%2F%2F%2F%2F%2F%2F%2F%2FwEaCXVzLWVhc3QtMSJHMEUCIGS%2F0fRhQiLwfwriFVEKza33Qhmx8SIAnzUCW%2B3aMhr8AiEA5Hy33F%2Beyib28TSErrhxRvuEpWxSuG%2BMbXgOSPnSjOAqiAQIiP%2F%2F%2F%2F%2F%2F%2F%2F%2F%2FARAEGgw4OTM3NTEzODUxNTkiDBiGqLmi38%2BzYpzWrCrcA%2BF9oVDoSiNfGjMux0l7BtAkyJQ8tvgbbltyzVymRBWozi8I9ssfMsNBHb5qLTeviJbvwMcVSvd1uRAcJxszHXr7IL%2F2GVNoDBfqfu%2FIf%2Fc%2FYwtlSdogpf7V6yaoVG%2Bb7DIJqkJGj6Uv4cVrqlMd%2BJY7VKRk%2BCIlj8F8%2BjDG2V9j9xy8MP1DWoH8aVqiGEF3QsUOgVP4sGSphDJP7YSSdkb7AQEj17rVODI%2FUlQvKI5a7a0t3Ao8QnJlsgltYUnmHCGbYhRYTT6X0ZW5TBGyccHlJV1dJteV6i28YMT97RC49ohCor%2F%2BZsrfYyijel1JBlRJuOZLOjRhDVvB0XEMJxgkzuJz8%2FIeHl6gRFshkeKSWYsZ1aDa04pdJzNVFRUzLukm2xvEDFo38DjxXliaL7PfKfAo%2FR2eEg6fMbqaxAxRh1jPuv4fLuvoKqkYwPEoAEovisKzo3qT%2F0rb7LJq%2Fu%2Ft6O0MLEfTByiqlfrv3l%2FIr3ZGueACUpRXgd%2FXrjZSx%2F%2BizgrZ6V8gQ4mH9NFLjwOB0U2RDy3EKFdxGfSlPeTeetLovNV225cnwcmx0ono2UXW4vynXq9Wp%2BlkxhDWNXvuOjSvQoUDB31xDp9pE%2BtLAsaSxMYrnbvQgarhMIW5qrMGOqUB0k6%2FKxlYIvKjCzSNPdZftI8dDZ7I7NFGXVhT0I80FXtB8fhKvi6VWxcIbCs1Zmn8O9zbb%2F7kTO2Fd%2Fi03DWZRVppcWa4mxGujcUu7SbAbQzKRrkqZbeKPt%2Bw5uMx%2BkBrnI3pEUpgJqsMljVVHyiyec%2Fs0MRZnTsGBQ47u5uX%2B0NihO4NVkGysx4Fz5uwrHi4O4%2Fm5mhk1U5SJtLddT5vJ2kxBkyL&X-Amz-Signature=71ffb3c0d3031bc7970fd6f43bcfbfd2a5440c617aa9d7f3a520eb0f352717c3&X-Amz-SignedHeaders=host#_Toc483484780) **Data Description**

[**4.2**](https://d2l-docbuilder-prod-us-east-1-converted.s3.amazonaws.com/4e61aee2-c54c-405d-87fb-a942d88746fc/295e706cefd64c207e6f06b8c5c4a661.html?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=ASIA5AF533RD6O7H2VEU%2F20240613%2Fus-east-1%2Fs3%2Faws4_request&X-Amz-Date=20240613T071716Z&X-Amz-Expires=5460&X-Amz-Security-Token=IQoJb3JpZ2luX2VjEPD%2F%2F%2F%2F%2F%2F%2F%2F%2F%2FwEaCXVzLWVhc3QtMSJHMEUCIGS%2F0fRhQiLwfwriFVEKza33Qhmx8SIAnzUCW%2B3aMhr8AiEA5Hy33F%2Beyib28TSErrhxRvuEpWxSuG%2BMbXgOSPnSjOAqiAQIiP%2F%2F%2F%2F%2F%2F%2F%2F%2F%2FARAEGgw4OTM3NTEzODUxNTkiDBiGqLmi38%2BzYpzWrCrcA%2BF9oVDoSiNfGjMux0l7BtAkyJQ8tvgbbltyzVymRBWozi8I9ssfMsNBHb5qLTeviJbvwMcVSvd1uRAcJxszHXr7IL%2F2GVNoDBfqfu%2FIf%2Fc%2FYwtlSdogpf7V6yaoVG%2Bb7DIJqkJGj6Uv4cVrqlMd%2BJY7VKRk%2BCIlj8F8%2BjDG2V9j9xy8MP1DWoH8aVqiGEF3QsUOgVP4sGSphDJP7YSSdkb7AQEj17rVODI%2FUlQvKI5a7a0t3Ao8QnJlsgltYUnmHCGbYhRYTT6X0ZW5TBGyccHlJV1dJteV6i28YMT97RC49ohCor%2F%2BZsrfYyijel1JBlRJuOZLOjRhDVvB0XEMJxgkzuJz8%2FIeHl6gRFshkeKSWYsZ1aDa04pdJzNVFRUzLukm2xvEDFo38DjxXliaL7PfKfAo%2FR2eEg6fMbqaxAxRh1jPuv4fLuvoKqkYwPEoAEovisKzo3qT%2F0rb7LJq%2Fu%2Ft6O0MLEfTByiqlfrv3l%2FIr3ZGueACUpRXgd%2FXrjZSx%2F%2BizgrZ6V8gQ4mH9NFLjwOB0U2RDy3EKFdxGfSlPeTeetLovNV225cnwcmx0ono2UXW4vynXq9Wp%2BlkxhDWNXvuOjSvQoUDB31xDp9pE%2BtLAsaSxMYrnbvQgarhMIW5qrMGOqUB0k6%2FKxlYIvKjCzSNPdZftI8dDZ7I7NFGXVhT0I80FXtB8fhKvi6VWxcIbCs1Zmn8O9zbb%2F7kTO2Fd%2Fi03DWZRVppcWa4mxGujcUu7SbAbQzKRrkqZbeKPt%2Bw5uMx%2BkBrnI3pEUpgJqsMljVVHyiyec%2Fs0MRZnTsGBQ47u5uX%2B0NihO4NVkGysx4Fz5uwrHi4O4%2Fm5mhk1U5SJtLddT5vJ2kxBkyL&X-Amz-Signature=71ffb3c0d3031bc7970fd6f43bcfbfd2a5440c617aa9d7f3a520eb0f352717c3&X-Amz-SignedHeaders=host#_Toc483484781) **Data Dictionary**

[**5**](https://d2l-docbuilder-prod-us-east-1-converted.s3.amazonaws.com/4e61aee2-c54c-405d-87fb-a942d88746fc/295e706cefd64c207e6f06b8c5c4a661.html?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=ASIA5AF533RD6O7H2VEU%2F20240613%2Fus-east-1%2Fs3%2Faws4_request&X-Amz-Date=20240613T071716Z&X-Amz-Expires=5460&X-Amz-Security-Token=IQoJb3JpZ2luX2VjEPD%2F%2F%2F%2F%2F%2F%2F%2F%2F%2FwEaCXVzLWVhc3QtMSJHMEUCIGS%2F0fRhQiLwfwriFVEKza33Qhmx8SIAnzUCW%2B3aMhr8AiEA5Hy33F%2Beyib28TSErrhxRvuEpWxSuG%2BMbXgOSPnSjOAqiAQIiP%2F%2F%2F%2F%2F%2F%2F%2F%2F%2FARAEGgw4OTM3NTEzODUxNTkiDBiGqLmi38%2BzYpzWrCrcA%2BF9oVDoSiNfGjMux0l7BtAkyJQ8tvgbbltyzVymRBWozi8I9ssfMsNBHb5qLTeviJbvwMcVSvd1uRAcJxszHXr7IL%2F2GVNoDBfqfu%2FIf%2Fc%2FYwtlSdogpf7V6yaoVG%2Bb7DIJqkJGj6Uv4cVrqlMd%2BJY7VKRk%2BCIlj8F8%2BjDG2V9j9xy8MP1DWoH8aVqiGEF3QsUOgVP4sGSphDJP7YSSdkb7AQEj17rVODI%2FUlQvKI5a7a0t3Ao8QnJlsgltYUnmHCGbYhRYTT6X0ZW5TBGyccHlJV1dJteV6i28YMT97RC49ohCor%2F%2BZsrfYyijel1JBlRJuOZLOjRhDVvB0XEMJxgkzuJz8%2FIeHl6gRFshkeKSWYsZ1aDa04pdJzNVFRUzLukm2xvEDFo38DjxXliaL7PfKfAo%2FR2eEg6fMbqaxAxRh1jPuv4fLuvoKqkYwPEoAEovisKzo3qT%2F0rb7LJq%2Fu%2Ft6O0MLEfTByiqlfrv3l%2FIr3ZGueACUpRXgd%2FXrjZSx%2F%2BizgrZ6V8gQ4mH9NFLjwOB0U2RDy3EKFdxGfSlPeTeetLovNV225cnwcmx0ono2UXW4vynXq9Wp%2BlkxhDWNXvuOjSvQoUDB31xDp9pE%2BtLAsaSxMYrnbvQgarhMIW5qrMGOqUB0k6%2FKxlYIvKjCzSNPdZftI8dDZ7I7NFGXVhT0I80FXtB8fhKvi6VWxcIbCs1Zmn8O9zbb%2F7kTO2Fd%2Fi03DWZRVppcWa4mxGujcUu7SbAbQzKRrkqZbeKPt%2Bw5uMx%2BkBrnI3pEUpgJqsMljVVHyiyec%2Fs0MRZnTsGBQ47u5uX%2B0NihO4NVkGysx4Fz5uwrHi4O4%2Fm5mhk1U5SJtLddT5vJ2kxBkyL&X-Amz-Signature=71ffb3c0d3031bc7970fd6f43bcfbfd2a5440c617aa9d7f3a520eb0f352717c3&X-Amz-SignedHeaders=host#_Toc483484782) **COMPONENT DESIGN**

[**6**](https://d2l-docbuilder-prod-us-east-1-converted.s3.amazonaws.com/4e61aee2-c54c-405d-87fb-a942d88746fc/295e706cefd64c207e6f06b8c5c4a661.html?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=ASIA5AF533RD6O7H2VEU%2F20240613%2Fus-east-1%2Fs3%2Faws4_request&X-Amz-Date=20240613T071716Z&X-Amz-Expires=5460&X-Amz-Security-Token=IQoJb3JpZ2luX2VjEPD%2F%2F%2F%2F%2F%2F%2F%2F%2F%2FwEaCXVzLWVhc3QtMSJHMEUCIGS%2F0fRhQiLwfwriFVEKza33Qhmx8SIAnzUCW%2B3aMhr8AiEA5Hy33F%2Beyib28TSErrhxRvuEpWxSuG%2BMbXgOSPnSjOAqiAQIiP%2F%2F%2F%2F%2F%2F%2F%2F%2F%2FARAEGgw4OTM3NTEzODUxNTkiDBiGqLmi38%2BzYpzWrCrcA%2BF9oVDoSiNfGjMux0l7BtAkyJQ8tvgbbltyzVymRBWozi8I9ssfMsNBHb5qLTeviJbvwMcVSvd1uRAcJxszHXr7IL%2F2GVNoDBfqfu%2FIf%2Fc%2FYwtlSdogpf7V6yaoVG%2Bb7DIJqkJGj6Uv4cVrqlMd%2BJY7VKRk%2BCIlj8F8%2BjDG2V9j9xy8MP1DWoH8aVqiGEF3QsUOgVP4sGSphDJP7YSSdkb7AQEj17rVODI%2FUlQvKI5a7a0t3Ao8QnJlsgltYUnmHCGbYhRYTT6X0ZW5TBGyccHlJV1dJteV6i28YMT97RC49ohCor%2F%2BZsrfYyijel1JBlRJuOZLOjRhDVvB0XEMJxgkzuJz8%2FIeHl6gRFshkeKSWYsZ1aDa04pdJzNVFRUzLukm2xvEDFo38DjxXliaL7PfKfAo%2FR2eEg6fMbqaxAxRh1jPuv4fLuvoKqkYwPEoAEovisKzo3qT%2F0rb7LJq%2Fu%2Ft6O0MLEfTByiqlfrv3l%2FIr3ZGueACUpRXgd%2FXrjZSx%2F%2BizgrZ6V8gQ4mH9NFLjwOB0U2RDy3EKFdxGfSlPeTeetLovNV225cnwcmx0ono2UXW4vynXq9Wp%2BlkxhDWNXvuOjSvQoUDB31xDp9pE%2BtLAsaSxMYrnbvQgarhMIW5qrMGOqUB0k6%2FKxlYIvKjCzSNPdZftI8dDZ7I7NFGXVhT0I80FXtB8fhKvi6VWxcIbCs1Zmn8O9zbb%2F7kTO2Fd%2Fi03DWZRVppcWa4mxGujcUu7SbAbQzKRrkqZbeKPt%2Bw5uMx%2BkBrnI3pEUpgJqsMljVVHyiyec%2Fs0MRZnTsGBQ47u5uX%2B0NihO4NVkGysx4Fz5uwrHi4O4%2Fm5mhk1U5SJtLddT5vJ2kxBkyL&X-Amz-Signature=71ffb3c0d3031bc7970fd6f43bcfbfd2a5440c617aa9d7f3a520eb0f352717c3&X-Amz-SignedHeaders=host#_Toc483484783) **HUMAN INTERFACE DESIGN**

[**6.1**](https://d2l-docbuilder-prod-us-east-1-converted.s3.amazonaws.com/4e61aee2-c54c-405d-87fb-a942d88746fc/295e706cefd64c207e6f06b8c5c4a661.html?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=ASIA5AF533RD6O7H2VEU%2F20240613%2Fus-east-1%2Fs3%2Faws4_request&X-Amz-Date=20240613T071716Z&X-Amz-Expires=5460&X-Amz-Security-Token=IQoJb3JpZ2luX2VjEPD%2F%2F%2F%2F%2F%2F%2F%2F%2F%2FwEaCXVzLWVhc3QtMSJHMEUCIGS%2F0fRhQiLwfwriFVEKza33Qhmx8SIAnzUCW%2B3aMhr8AiEA5Hy33F%2Beyib28TSErrhxRvuEpWxSuG%2BMbXgOSPnSjOAqiAQIiP%2F%2F%2F%2F%2F%2F%2F%2F%2F%2FARAEGgw4OTM3NTEzODUxNTkiDBiGqLmi38%2BzYpzWrCrcA%2BF9oVDoSiNfGjMux0l7BtAkyJQ8tvgbbltyzVymRBWozi8I9ssfMsNBHb5qLTeviJbvwMcVSvd1uRAcJxszHXr7IL%2F2GVNoDBfqfu%2FIf%2Fc%2FYwtlSdogpf7V6yaoVG%2Bb7DIJqkJGj6Uv4cVrqlMd%2BJY7VKRk%2BCIlj8F8%2BjDG2V9j9xy8MP1DWoH8aVqiGEF3QsUOgVP4sGSphDJP7YSSdkb7AQEj17rVODI%2FUlQvKI5a7a0t3Ao8QnJlsgltYUnmHCGbYhRYTT6X0ZW5TBGyccHlJV1dJteV6i28YMT97RC49ohCor%2F%2BZsrfYyijel1JBlRJuOZLOjRhDVvB0XEMJxgkzuJz8%2FIeHl6gRFshkeKSWYsZ1aDa04pdJzNVFRUzLukm2xvEDFo38DjxXliaL7PfKfAo%2FR2eEg6fMbqaxAxRh1jPuv4fLuvoKqkYwPEoAEovisKzo3qT%2F0rb7LJq%2Fu%2Ft6O0MLEfTByiqlfrv3l%2FIr3ZGueACUpRXgd%2FXrjZSx%2F%2BizgrZ6V8gQ4mH9NFLjwOB0U2RDy3EKFdxGfSlPeTeetLovNV225cnwcmx0ono2UXW4vynXq9Wp%2BlkxhDWNXvuOjSvQoUDB31xDp9pE%2BtLAsaSxMYrnbvQgarhMIW5qrMGOqUB0k6%2FKxlYIvKjCzSNPdZftI8dDZ7I7NFGXVhT0I80FXtB8fhKvi6VWxcIbCs1Zmn8O9zbb%2F7kTO2Fd%2Fi03DWZRVppcWa4mxGujcUu7SbAbQzKRrkqZbeKPt%2Bw5uMx%2BkBrnI3pEUpgJqsMljVVHyiyec%2Fs0MRZnTsGBQ47u5uX%2B0NihO4NVkGysx4Fz5uwrHi4O4%2Fm5mhk1U5SJtLddT5vJ2kxBkyL&X-Amz-Signature=71ffb3c0d3031bc7970fd6f43bcfbfd2a5440c617aa9d7f3a520eb0f352717c3&X-Amz-SignedHeaders=host#_Toc483484784) **Overview of User Interface**

[**6.2**](https://d2l-docbuilder-prod-us-east-1-converted.s3.amazonaws.com/4e61aee2-c54c-405d-87fb-a942d88746fc/295e706cefd64c207e6f06b8c5c4a661.html?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=ASIA5AF533RD6O7H2VEU%2F20240613%2Fus-east-1%2Fs3%2Faws4_request&X-Amz-Date=20240613T071716Z&X-Amz-Expires=5460&X-Amz-Security-Token=IQoJb3JpZ2luX2VjEPD%2F%2F%2F%2F%2F%2F%2F%2F%2F%2FwEaCXVzLWVhc3QtMSJHMEUCIGS%2F0fRhQiLwfwriFVEKza33Qhmx8SIAnzUCW%2B3aMhr8AiEA5Hy33F%2Beyib28TSErrhxRvuEpWxSuG%2BMbXgOSPnSjOAqiAQIiP%2F%2F%2F%2F%2F%2F%2F%2F%2F%2FARAEGgw4OTM3NTEzODUxNTkiDBiGqLmi38%2BzYpzWrCrcA%2BF9oVDoSiNfGjMux0l7BtAkyJQ8tvgbbltyzVymRBWozi8I9ssfMsNBHb5qLTeviJbvwMcVSvd1uRAcJxszHXr7IL%2F2GVNoDBfqfu%2FIf%2Fc%2FYwtlSdogpf7V6yaoVG%2Bb7DIJqkJGj6Uv4cVrqlMd%2BJY7VKRk%2BCIlj8F8%2BjDG2V9j9xy8MP1DWoH8aVqiGEF3QsUOgVP4sGSphDJP7YSSdkb7AQEj17rVODI%2FUlQvKI5a7a0t3Ao8QnJlsgltYUnmHCGbYhRYTT6X0ZW5TBGyccHlJV1dJteV6i28YMT97RC49ohCor%2F%2BZsrfYyijel1JBlRJuOZLOjRhDVvB0XEMJxgkzuJz8%2FIeHl6gRFshkeKSWYsZ1aDa04pdJzNVFRUzLukm2xvEDFo38DjxXliaL7PfKfAo%2FR2eEg6fMbqaxAxRh1jPuv4fLuvoKqkYwPEoAEovisKzo3qT%2F0rb7LJq%2Fu%2Ft6O0MLEfTByiqlfrv3l%2FIr3ZGueACUpRXgd%2FXrjZSx%2F%2BizgrZ6V8gQ4mH9NFLjwOB0U2RDy3EKFdxGfSlPeTeetLovNV225cnwcmx0ono2UXW4vynXq9Wp%2BlkxhDWNXvuOjSvQoUDB31xDp9pE%2BtLAsaSxMYrnbvQgarhMIW5qrMGOqUB0k6%2FKxlYIvKjCzSNPdZftI8dDZ7I7NFGXVhT0I80FXtB8fhKvi6VWxcIbCs1Zmn8O9zbb%2F7kTO2Fd%2Fi03DWZRVppcWa4mxGujcUu7SbAbQzKRrkqZbeKPt%2Bw5uMx%2BkBrnI3pEUpgJqsMljVVHyiyec%2Fs0MRZnTsGBQ47u5uX%2B0NihO4NVkGysx4Fz5uwrHi4O4%2Fm5mhk1U5SJtLddT5vJ2kxBkyL&X-Amz-Signature=71ffb3c0d3031bc7970fd6f43bcfbfd2a5440c617aa9d7f3a520eb0f352717c3&X-Amz-SignedHeaders=host#_Toc483484785) **Screen Images**

[**7**](https://d2l-docbuilder-prod-us-east-1-converted.s3.amazonaws.com/4e61aee2-c54c-405d-87fb-a942d88746fc/295e706cefd64c207e6f06b8c5c4a661.html?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=ASIA5AF533RD6O7H2VEU%2F20240613%2Fus-east-1%2Fs3%2Faws4_request&X-Amz-Date=20240613T071716Z&X-Amz-Expires=5460&X-Amz-Security-Token=IQoJb3JpZ2luX2VjEPD%2F%2F%2F%2F%2F%2F%2F%2F%2F%2FwEaCXVzLWVhc3QtMSJHMEUCIGS%2F0fRhQiLwfwriFVEKza33Qhmx8SIAnzUCW%2B3aMhr8AiEA5Hy33F%2Beyib28TSErrhxRvuEpWxSuG%2BMbXgOSPnSjOAqiAQIiP%2F%2F%2F%2F%2F%2F%2F%2F%2F%2FARAEGgw4OTM3NTEzODUxNTkiDBiGqLmi38%2BzYpzWrCrcA%2BF9oVDoSiNfGjMux0l7BtAkyJQ8tvgbbltyzVymRBWozi8I9ssfMsNBHb5qLTeviJbvwMcVSvd1uRAcJxszHXr7IL%2F2GVNoDBfqfu%2FIf%2Fc%2FYwtlSdogpf7V6yaoVG%2Bb7DIJqkJGj6Uv4cVrqlMd%2BJY7VKRk%2BCIlj8F8%2BjDG2V9j9xy8MP1DWoH8aVqiGEF3QsUOgVP4sGSphDJP7YSSdkb7AQEj17rVODI%2FUlQvKI5a7a0t3Ao8QnJlsgltYUnmHCGbYhRYTT6X0ZW5TBGyccHlJV1dJteV6i28YMT97RC49ohCor%2F%2BZsrfYyijel1JBlRJuOZLOjRhDVvB0XEMJxgkzuJz8%2FIeHl6gRFshkeKSWYsZ1aDa04pdJzNVFRUzLukm2xvEDFo38DjxXliaL7PfKfAo%2FR2eEg6fMbqaxAxRh1jPuv4fLuvoKqkYwPEoAEovisKzo3qT%2F0rb7LJq%2Fu%2Ft6O0MLEfTByiqlfrv3l%2FIr3ZGueACUpRXgd%2FXrjZSx%2F%2BizgrZ6V8gQ4mH9NFLjwOB0U2RDy3EKFdxGfSlPeTeetLovNV225cnwcmx0ono2UXW4vynXq9Wp%2BlkxhDWNXvuOjSvQoUDB31xDp9pE%2BtLAsaSxMYrnbvQgarhMIW5qrMGOqUB0k6%2FKxlYIvKjCzSNPdZftI8dDZ7I7NFGXVhT0I80FXtB8fhKvi6VWxcIbCs1Zmn8O9zbb%2F7kTO2Fd%2Fi03DWZRVppcWa4mxGujcUu7SbAbQzKRrkqZbeKPt%2Bw5uMx%2BkBrnI3pEUpgJqsMljVVHyiyec%2Fs0MRZnTsGBQ47u5uX%2B0NihO4NVkGysx4Fz5uwrHi4O4%2Fm5mhk1U5SJtLddT5vJ2kxBkyL&X-Amz-Signature=71ffb3c0d3031bc7970fd6f43bcfbfd2a5440c617aa9d7f3a520eb0f352717c3&X-Amz-SignedHeaders=host#_Toc483484787) **REQUIREMENTS MATRIX**

# **1 INTRODUCTION**

## **1.1 Purpose**

The document summarizes the architecture and system design of the Accommodation Reservation Manager software for key project stakeholders.

## **1.2 Scope**

The software acts as the controller between Account and Reservation Data and the User Interface View that will be implemented. The key objectives are to create an efficient system that generates new accounts and reservations in addition to loading accounts and reservations. The Accommodation Reservation Manager adds the business logic layer required to increase productivity.

The only functionality within scope of the Accommodation Reservation Manager software is the business logic. Designing a User Interface and building the production record keeping system are out of scope of this system.

## **1.3 Overview**

This document includes a high-level overview of relationships between classes, interfaces, and data. For illustration, a system diagram will be included. Additionally, each class, subclass, and interface will be described in detail to include purpose, attributes, methods, exception handling, and overall system requirements.

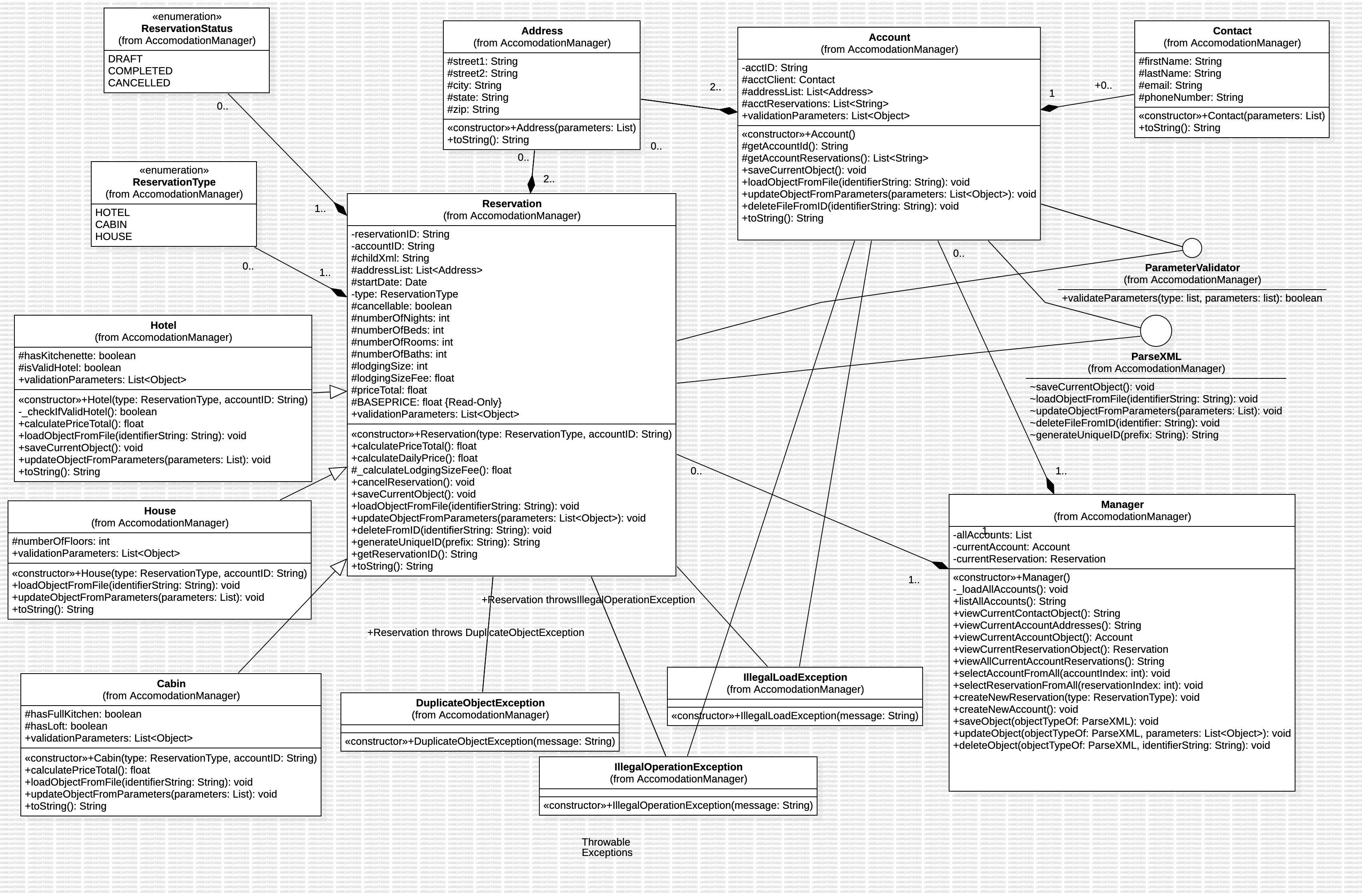
# **2 SYSTEM OVERVIEW**

The system is designed to create and manage records using an object-oriented approach. Data created or loaded will be represented as an object for the user to interact with for record management via the user interface. The system will create new customer accounts, in which Hotel, House, or Cabin Reservations can be created and assigned. Additionally, the system will load all saved customer accounts and reservations associated with that customer account from the records keeping system..  
  
The user will have the option to update accounts and reservation records. Upon creation, update, or deletion of records, the system will serialize and send data to the records keeping system. The data is serialize into XML format for the records keeping system to manage.

# **3 SYSTEM ARCHITECTURE**

## **3.1 Architectural Design**

The following is the class diagram of the Accommodation Reservation Manager system.



## **3.2 Decomposition Description**

Upon Application load, the application will load a new Manager class instance. Upon instantiation, this class will load all customer account IDs into an ArrayList as Strings for the user to choose from. Optionally, the user can create a new Account using the Manager object’s createNewAccount() method, in which they can update information through providing the required parameters using the UI. Updating the customer account information is done by calling the updateObject() Method and passing the current account object and parameters List into the method as method parameters.

Should a user want to load a customer account from the records keeping system into the Manager object, they will call the selectAccountFromAll() method, passing the relevant index from the allAccounts List as a parameter. This method will assign the loaded Account to the Manager objects currentAccount attribute. Additionally, the user can list all the Account’s associated Reservations by calling the viewAllCurrentAccountReservations() method. This will display all Reservations IDs for the user to choose from. The user can load a specific account reservation by calling the selectReservationFromAll() method and passing the index of the reservation ID into the method. This method will assign the loaded Reservation to the Manager object’s currentReservation attribute for the user to update as necessary.

Only once a customer account object is loaded, the user can create a new reservation using the createNewReservation method and passing the relevant ReservationType value from the ReservationType enum as a parameter into the method. This method will call the correct Reservation child class constructor and assign the new Reservation to the Manager object’s currentReservation attribute. To update the Reservation attributes, the user can call the updateObject() method, passing the Manager objects currentReservation attribute and parameter List as the parameters.

When an Account object is created, the constructor requires no parameters as it creates an empty object to be populated with parameters by the UI. An account object can be saved by calling the Manager object’s saveObject() method and passing the Manager objects currentAccount attribute using the viewCurrentAccountObject() method. When calling the saveObject() method, the Account data is saved into the records keeping system.

The Reservation object requires a ReservationType and accountID to be instantiated. The Reservation object can be save by calling the Manager objects saveObject() method and passing the Manager object’s currentReservation attribute using the viewCurrentReservation() method. When calling the saveObject() method, the Reservation data is saved into the records keeping system.

The Account and Reservation objects are encapsulated within the Manager object as private attributes to prevent direct access from the UI. This way the UI can not change them directly.

## **3.3 Exception Handling**

The System will have specialize Exceptions called IllegalLoadException, DuplicateObjectException, and IllegalOperationException. Additionally, The exceptions are implemented in each class as follows:

**Manager Class**

The selectAccountFromAll and selectReservationFromAll methods throw the IllegalOperationException when a given index is out of range for the attribute List.

The createNewReservation method throws the IllegalOperationException when there is no account loaded in the currentAccount attribute of the Manager class.

The \_loadAllAccounts method catches any Exceptions that relate to IOOperations.

The viewCurrentAccountContact method throws and catches an IllegalOperationException if no Account object is available in the currentAccount attribute is available.

The viewCurrentAccountAddress method throws and catches an IllegalOperationException if no Account object is available in the currentAccount attribute is available.

The viewCurrentAccountObject method throws and catches an IllegalOperationException if no Account object is available in the currentAccount attribute is available.

The viewCurrentReservationObject method throws and catches an IllegalOperationException if no Reservation object is in the currentReservation attribute is available.

The viewAllCurrentAccountReservations method throws and catches an IllegalOperationException if no Account object is available in the currentAccount attribute is available.

The selectAccountFromAll catches any Exception thrown from the method itself or any method called from the Account object loadObjectFromFile method.

The selectReservationFromAll method catches any Exception thrown from internal to the method.

The createNewReservation method catches any Exception thrown from internal to the method.

The saveObject method catches any exception thrown from the Account object saveCurrentObject method.

The updateObject method catches any Exception thrown from the parameterized object’s updateObjectFromParameters and saveCurrentObject methods.

The deleteObject method catched any Exception thrown from the parameterized object’s deleteFromFileID method.

**Account Class**

The saveCurrentObject method throws the IllegalOperationException if the currentAccount does not have a Contact or Address associated with the object.

The loadObjectFromFile method throws an IllegalLoadException if the Account does not exist in the records management system.

The updateObjectFromParameters method throws an IllegalArgumentException if the parameters included for updating the object do not match the appropriate type. This helps enforce type safety in parameters.

The deleteFileFromID method throws an IllegalOperationException when a user attempts to delete an Account from the records management system.

**Reservation Class**

The cancelReservation method throws an IllegalOperationException if the reservation is not cancellable.

The saveCurrentObject method throws an IllegalStateException if the ReservatoinStatus of the Reservation is set to Cancelled.

The loadObjectFromFile method throws and IllegalLoadException if the Reservation attemping to be loaded does not exist.

The deleteFileFromID method throws an IllegalStateException if the Reservation is not cancelleable.

**Cabin Class**

The updateObjectFromParameters method throws an IllegalArgumentException if the parameters included for updating the object do not match the appropriate type. This helps enforce type safety in parameters.

**Hotel Class**

The updateObjectFromParameters method throws an IllegalArgumentException if the parameters included for updating the object do not match the appropriate type. This helps enforce type safety in parameters.

**House Class**

The updateObjectFromParameters method throws an IllegalArgumentException if the parameters included for updating the object do not match the appropriate type. This helps enforce type safety in parameters.

**3.4 Design Rationale**

Discuss the rationale for selecting the architecture described in 3.1 including critical issues and trade/offs that were considered. You may discuss other architectures that were considered, provided that you explain why you didn’t choose them.

# **4 DATA DESIGN**

## **4.1 Data Description**

For the Accommodation Reservation Manager system, the UI will be able to manage Account and Reservation records through the Manager object. See below for examples.  
  
Accounts

File Name: acc-A2gjk4315y.xml  
  
File Contents:

<Account>

<accountID>A2gjk4315y</accountID>

<Contact>

<firstName>Terry</firstName>

<lastName>Smith</lastName>

<email>tsmith@gmail.com</email>

<phone>111-111-1111</phone>

</Contact>

<PhysicalAddress>

<Address>

<street1>178 old 30 rd</street1>

<street2></street2>

<city>Nashville</city>

<state>TN</state>

<zip>27505</zip>

</Address>

</PhysicalAddress>

<MailingAddress>

<Address>

<street1>178 old 30 rd</street1>

<street2></street2>

<city>Nashville</city>

<state>TN</state>

<zip>27505</zip>

</Address>

</MailingAddress>

<Reservations>[HOUDiV05LDWNd]</Reservations>

</Account>

Reservation

File Name: res-HOUDiV05LDWNd.xml

<HotelReservation>

<reservationID>HOUDiV05LDWNd</reservationID>

<accountID>A2gjk4315y</accountID>

<reservationStatus>DRAFT</reservationStatus>

<PhysicalAddress>

<Address>

<street1>178 old 30 rd</street1>

<street2></street2>

<city>Nashville</city>

<state>TN</state>

<zip>27505</zip>

</Address>

</PhysicalAddress>

<MailingAddress>

<Address>

<street1>178 old 30 rd</street1>

<street2></street2>

<city>Nashville</city>

<state>TN</state>

<zip>27505</zip>

</Address>

</MailingAddress>

<date>Sun Jul 21 14:00:23 CEST 2024</date>

<numberOfNights>1</numberOfNights>

<numberOfBeds>1</numberOfBeds>

<numberOfRooms>1</numberOfRooms>

<numberOfBaths>1</numberOfBaths>

<lodgingSize>1</lodgingSize>

<numberOfFloors>1</numberOfFloors>

</HotelReservation>

## **4.2 Data Dictionary**

The entities and major data elements are parsed in xml format. They are as follows:

Account

|  |  |  |
| --- | --- | --- |
| **Name** | **Type** | **Description** |
| Account ID | String | Unique account identifier |
| Contact | Contact as String collection | Collection of first name, last name, email, and phone number |
| Physical Address | Address as String Collection | Collection of street address, city, state, and zip code |
| Mailing Address | Address as String Collection | Collection of street address, city, state, and zip code |
| Reservation List (By ID) | Reservations ID as String List | List of Reservation Ids associated with the Account |

Reservation

|  |  |  |
| --- | --- | --- |
| **Name** | **Type** | **Description** |
| Reservation ID | String | Unique reservation identifier |
| Account ID | String | Identifier of Account associated with Reservation |
| Reservation Status | ReservationStatus as String | String identifier of reservation status. Can be DRAFT, COMPLETED, or CANCELLED |
| Physical Address | Address as String Collection | Collection of street address, city, state, and zip code |
| Mailing Address | Address as String Collection | Collection of street address, city, state, and zip code |
| Mailing Address | Address as String Collection | Collection of street address, city, state, and zip code |
| Start Date | Date Format as String | Date in which the Reservation begins |
| Number of Nights | Integer | Number of nights the reservation is booked |
| Number of Beds | Integer | Number of beds in the reservation |
| Number of Rooms | Integer | Number of Rooms the reservation requires |
| Number of Baths | Integer | Number of Bathrooms the reservation requires |
| Lodging Size | Integer | Size of Reservation |
| Number Of Floors (House Reservation Unique) | Integer | Number of floors in reservation |
| Has Kitchenette (Hotel Reservation Unique) | Boolean | Truth value to determine if reservation has kitchenette |
| Has Full Kitchen (Cabin Reservation Unique) | Boolean | Truth value to determine if reservation has full kitchen |
| Has Loft (Cabin Reservation Unique) | Boolean | Truth value to determine if reservation has loft |

# **5 COMPONENT DESIGN**

**Class Name:** Manager

**Class Description/Purpose:** Class that manages Reservations and Accounts as protected classes. It acts as the middleware for the UI to interface with.

**Class Modifiers:** public

**Class Inheritance:** none

**Class Attributes:**

allAccounts: List<String> - contains all account ID’s as string to be chosen by the user

currentAccount: Account – the current Account object for the UI to interact with.

currentReservation: Reservation – the current Reservation object for the UI to interact with

**Exceptions Thrown:** IllegalOperationException

**Class Constructors:** public Manager()

**Class Methods:**

public Manager()

This.\_loadAllAccounts()

private void \_loadAllAccounts()

Load all account IDs into allAccounts List from accounts directory

public String listAllAccounts()

return this.allAccounts.toString()

public String viewCurrentAccountAddresses()

If this.currentAccount equals null throw IllegalOperationException with message “No Account Selected”

return this.currentAccount.addressList.toString()

public Account viewCurrentAccountObject()

If this.currentAccount equals null throw IllegalOperationException with message “No Account Selected”

return this.currentAccount

public Reservation viewCurrentReservationObject()

If this.currentReservation equals null throw IllegalOperationException with message “No Account Selected”

return this.currentReservation

public String viewCurrentAccountReservations()

If this.currentAccount equals null throw IllegalOperationException with message “No Account Selected”

return this.currentAccount.acctReservations.toString()

public void selectReservationFromAll(int reservationIndex)

If reservationIndex > this.currenAccount.acctReservations.size() - 1, throw new IllegalArgumentException with message “Index is outside of List range”

If this.currentAccount == null, throw new IllegalOperationException with message “No account selected”

Match reservation file name to regex patterns “^HOT.\*”, “^HOU.\*”, or “^.CAB”, assign new blank Reservation Child class object to this.currentReservation, passing ReservationType and this.currentAccount accountID as parameters

Call loadObjectFromFile() method on this.currentReservation object

public void createNewReservation(ReservationType type)

If this.currenAccount == null, throw new IllegalOperationException with message “No current account selected”

switch(type)

Case HOTEL:

new Hotel(type, this.currentAccount.getAccountIf)

Case HOUSE:

new House(type, this.currentAccount.getAccountIf)

Case CABIN:

new Cabin(type, this.currentAccount.getAccountIf)

public void createNewAccount()

this.currentAccout = new Account()

public void saveObject(ParseXML objectTypeOf)

ObjectTypeOf.saveCurrentObject()

public void updateObject(ParseXML objectTypeOf, List<Object> parameters)

objectTypeOf.updateObjectFromParameters(parameters)

ObjectTypeOf.savecurrentObject();

public void deleteObject(ParseXML objectTypeOf, String identifierString)

ObjectTypeOf.deleteFileFromID(identifierString)

**Class Name:** Account

**Class Description/Purpose: Creates and manages Accounts objects and records**

**Class Modifiers: protected**

**Class Inheritance: none**

**Class Attributes:**

acctID: String – String of unique account ID

acctClient: Contact – Contact object of customer information

addressList: List<Address> - List of Address Objects for tracking physical and mailing address

acctReservations: List<String> - List of reservation IDs associated with the account

ValidationParameters: List<Object> - List of Objects to retrieve object type for validating parameters when the updateObjectFromParameters method is called.

**Exceptions Thrown: throws IOException, IllegalLoadException, IllegalArgumentException, and IllegalOperationException**

**Class Constructors: protected Account()**

**Class Methods:**

protected String getAccountId()

return this.actdID

Protected List<String> getAccountReservations()

Return this.acctReservations

public void saveCurrentObject()

If no acctID, this.generateUniqueID

If directory does not exist, create directory

Write object to file

public void loadObjectFromFile(String identifier)

this.acctID = identifierString

locate file, read file as string

Parse XML, build object while parsing xml file

public void updateObjectFromParameters(List<Object> parameters)

Validate parameters for type safety

Update current object with validated parameters

public void deleteFileFromID(String identifierString)

throw IllegalOperationException

@Override

public String toString()

Return Account object as String in XML format

**Class Name:** Reservation

**Class Description/Purpose:** Creates and manages Reservation objects and records

**Class Modifiers:** protected

**Class Inheritance:** Abstract Parent

**Class Attributes:**

reservationID: String – Unique ID for the Reservation

accountID: String – Account ID associated with the reservation

childXml: String – remaining XML string for child classes to parse

addressList: List<Address> - List of Addresses associated with reservation

startDate: Date – start date of reservation

status: ReservationStatus – Type of reservation (HOUSE, HOTEL, OR CABIN)

cancellable: boolean – truth value to determine if reservation is cancellable

numberOfNights: Integer – number of nights the reservation lasts

numberOfBeds: Integer – number of beds in reservation

numberOfRooms: Integer – number of rooms in the reservation

numberOfBaths: Integer – number of bathrooms in the reservation

lodgingSize: float – size of reservation

priceTotal: float – total cost of reservation

BASEPRICE: float – final, readonly value for the base reservation price

validationParameters: List<Object> - List of Objects to retrieve object type for validating parameters when the updateObjectFromParameters method is called.

**Exceptions Thrown:** IllegalOperationException, IllegalStateException, IllegalLoadException,

**Class Constructors: protected Reservation(ReservationType type, String accountId)**

**Class Methods:**

public float calculatePriceTotal()

Return BASEPRICE + \_calculateLodginSizeFee()

public float calculateDailyPrice()

rerun (this.calculatePriceTotal / this.numberOfNights

public float \_calculateLodgingPrice()

rerun this.lodgingSize > 900 ? (this.lodgingSize - 900 ) \* 15 : 0;

public void saveCurrentObject()

if this.status == CANCELLED, throw IllegalState Exception with mesage Can not save or update current Reservation due to CANCELLED status

Find file based on reservationID, write reservation object to xml string

public void loadObjectFromFile(String identifierString)

this.reservationID = identifierString

if file doesn’t exist, throw new IllegalLoadException with message “Reservation does not exist”

Parse XML for information as string

Parse String and update object parameters via parsing

public void updateObjectFromParameters(List<Object> parameters)

validate parameters for type safety

Update parameters

public float deleteFromFile(String identifierString)

if this.cancellable == false, throw new IllegalStateException with message “Reservation is not cancellable”

this.status = ReservationStatus.CANCELLED

Public String getReservationID()

return this.reservationID

Public String toString()

return String of Reservation XML information

**Class Name:** Cabin

**Class Description/Purpose:** Creates and manages Cabin objects and records

**Class Modifiers:** protected

**Class Inheritance:** child of Reservation

**Class Attributes:**

hasFullKitchen: boolean – truth value to determine if Cabin object has a full kitchen

HasLoft: boolean – truth value to determine if Cabin object has loft or not

validationParameters: List<Object> - List of Objects to retrieve object type for validating parameters when the updateObjectFromParameters method is called.

**Exceptions Thrown:** IllegalArgumentException

**Class Constructors:** protected Cabin( ReservationType type, String accountID)

**Class Methods:**

@Override

public float calculatePriceTotal()

Return BASEPRICE + \_calculateLodginSizeFee() + (this.hasFullKitchen ? (20 + (5 \* this.numberOfRooms)) : (5 \* this.numberOfRooms));

@Override

public void loadObjectFromFile(String identifierString)

this.reservationID = identifierString

if file doesn’t exist, throw new IllegalLoadException with message “Reservation does not exist”

Parse XML for information as string

Parse String and update object parameters via parsing

**@Override**

public void updateObjectFromParameters(List<Object> parameters)

validate parameters for type safety

Update parameters

Public String toString()

return String of Reservation XML information

**Class Name:** Hotel

**Class Description/Purpose:** Creates and manages Cabin objects and records

**Class Modifiers:** protected

**Class Inheritance:** child of Reservation

**Class Attributes:**

HasKitchenette: boolean – truth value to identify if Hotel has kitchenette

IsValidHotel: boolean – truth value to determine if hotel is a valid hotel based on number of beds == 2 and number of rooms = 1

validationParameters: List<Object> - List of Objects to retrieve object type for validating parameters when the updateObjectFromParameters method is called.

**Exceptions Thrown:** IllegalArgumentException

**Class Constructors:** protected Hotel ReservationType type, String accountID)

**Class Methods:**

private boolean \_validateIfValidHotel()

Return (this.numberOfBeds == 2 && this.numberOfRooms == 1 ) ? True : false

@Override

public float calculatePriceTotal()

Return BASEPRICE + \_calculateLodgingSizeFee() + ((this.hasKitchenette ? 60 : 50 ))

@Override

public void loadObjectFromFile(String identifierString)

this.reservationID = identifierString

if file doesn’t exist, throw new IllegalLoadException with message “Reservation does not exist”

Parse XML for information as string

Parse String and update object parameters via parsing

**@Override**

public void updateObjectFromParameters(List<Object> parameters)

validate parameters for type safety

Update parameters

Public String toString()

return String of Reservation XML information

**Class Name:** House

**Class Description/Purpose:** Creates and manages Cabin objects and records

**Class Modifiers:** protected

**Class Inheritance:** child of Reservation

**Class Attributes:**

numberOfFloors: Integer – number of floors a reservation has

validationParameters: List<Object> - List of Objects to retrieve object type for validating parameters when the updateObjectFromParameters method is called.

**Exceptions Thrown:** IlegalArgumentException

**Class Constructors: protected House(ReservationType type, String accountID)**

**Class Methods:**

@Override

public void loadObjectFromFile(String identifierString)

this.reservationID = identifierString

if file doesn’t exist, throw new IllegalLoadException with message “Reservation does not exist”

Parse XML for information as string

Parse String and update object parameters via parsing

**@Override**

public void updateObjectFromParameters(List<Object> parameters)

validate parameters for type safety

Update parameters

**@Override**

Public String toString()

return String of Reservation XML information

**Interface Name:** ParseXML

**Interface Description/Purpose:** Interface that gives objects functions to interact with record keeping system

**Interface Modifiers: default**

**Interface Methods:**

**void saveCurrentObject() throws Exception;**

**void loadObjectFromFile(String identifierString) throws Exception;**

**void updateFileFromParameters(List<Object> parameters) throws Exception;**

**void deleteFileFromID(String identifier) throws Exception;**

**default String generateUniqueID(String prefix)**

**Take prefix**

**Stringbuilder to build random characters String**

**Interface Name: ParameterValidator**

**Interface Description/Purpose: Creates default interface to validate parameters of Account or Reservation**

**Interface Methods:**

**default boolean validateParameters(List<Object> type, List<Object> parameters)**

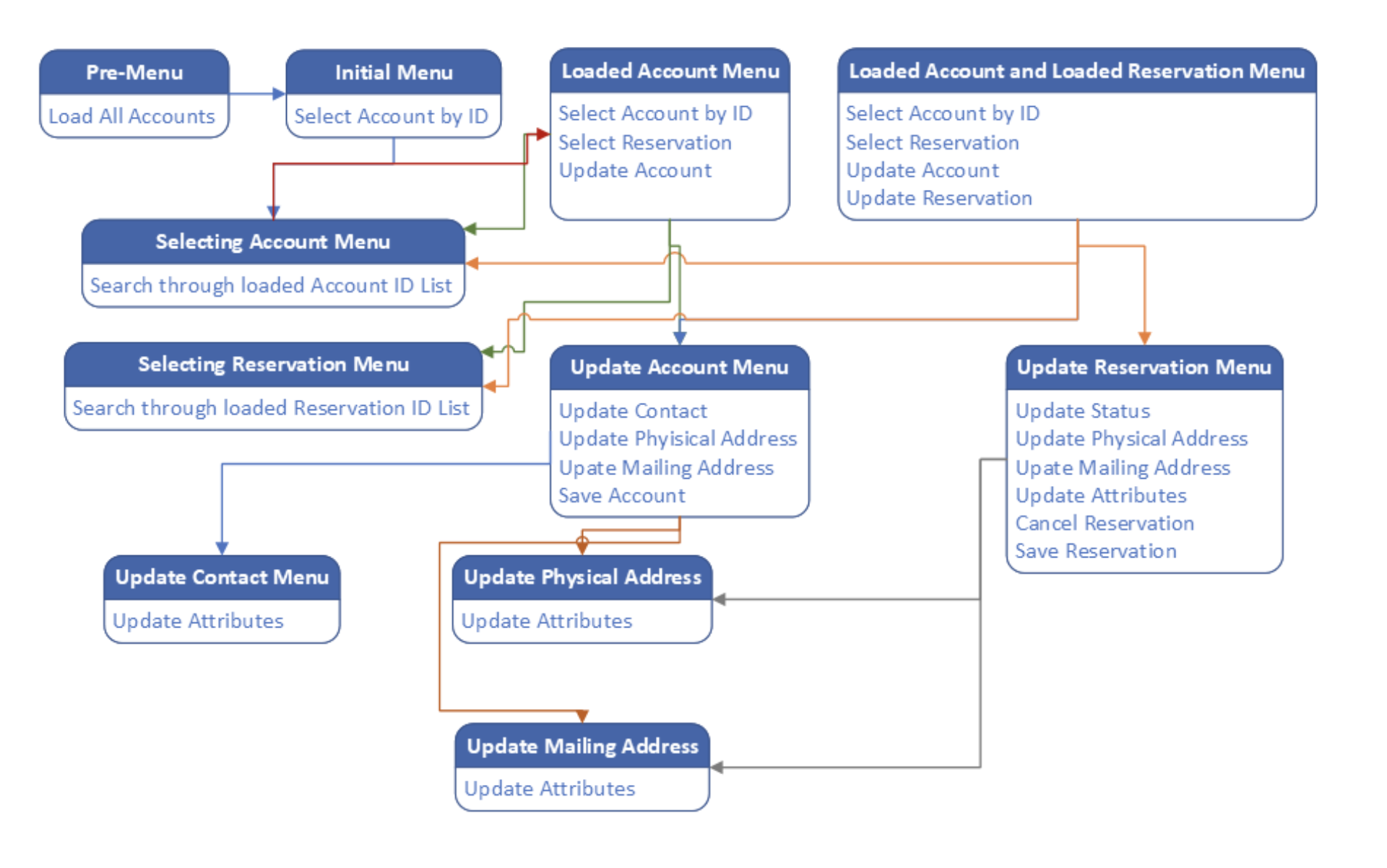
**Transform both type List and parameters list elements to String of classType,**

**Return truth value if both lists match**

# **6 HUMAN INTERFACE DESIGN**

## **6.1 Overview of User Interface**

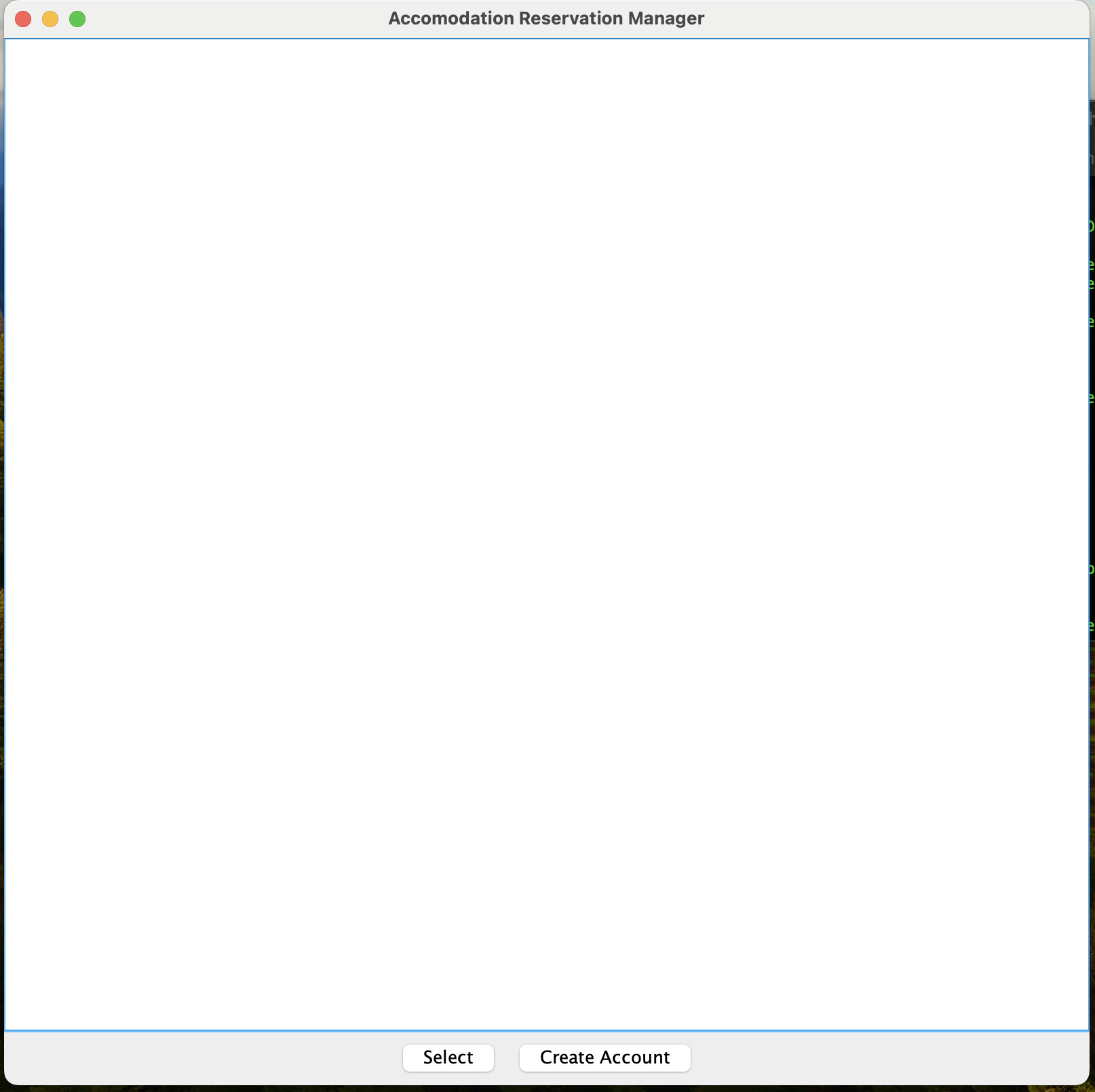
The functionality will of the User Interface will operate similar to a state machine. Each separate state will provide the user different performable actions and object availability. The figure below illustrates the primary states available for the user to interact with. The following figure omits the state in which the user is inputting values for records as it is implied.



## **6.2 Screen Images, Objects, and Actions**

The following is a prototyped GUI. It does not include Account or Reservation Data loaded into the screens.

Select Account Screen

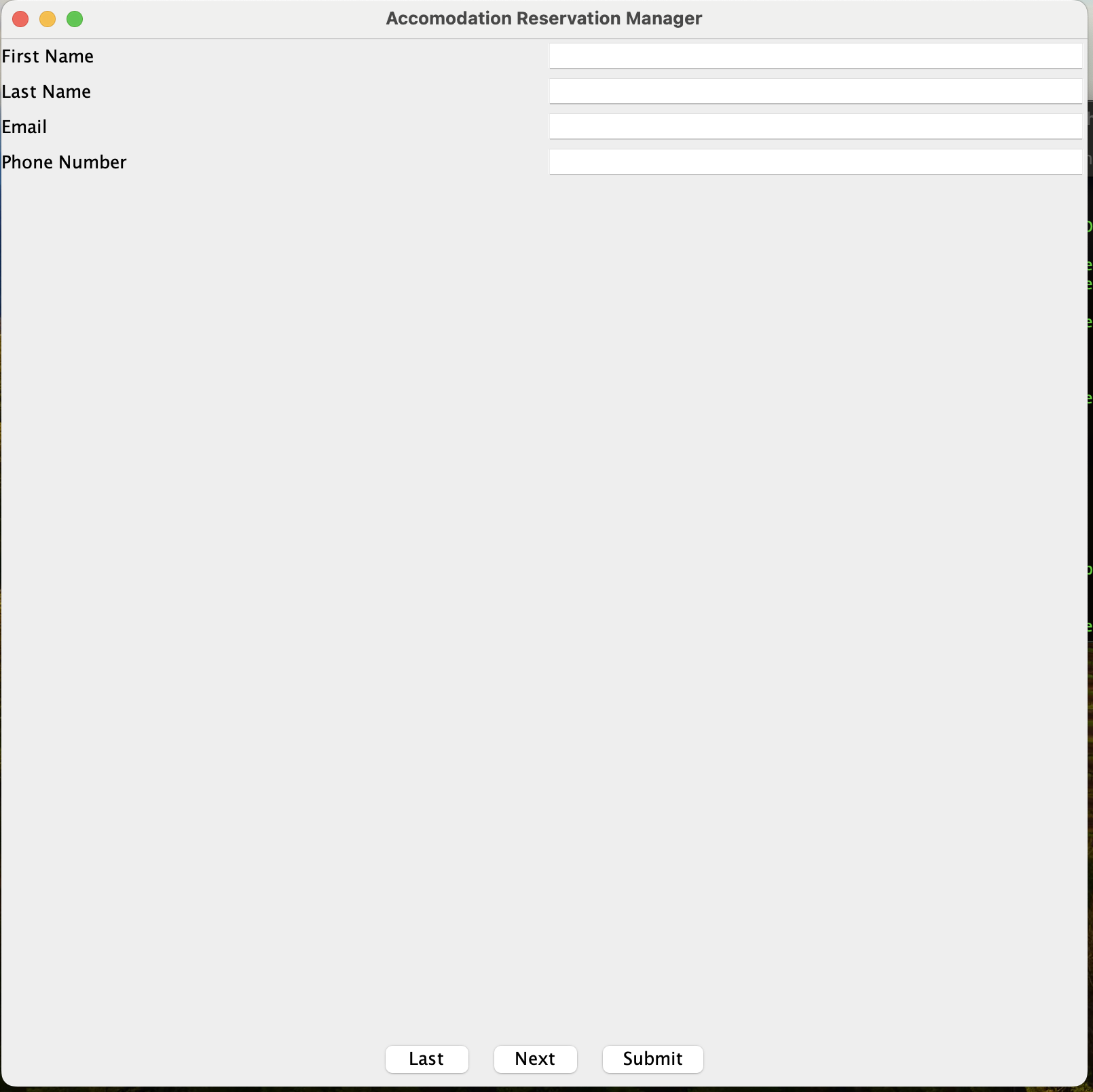


Initial Screen

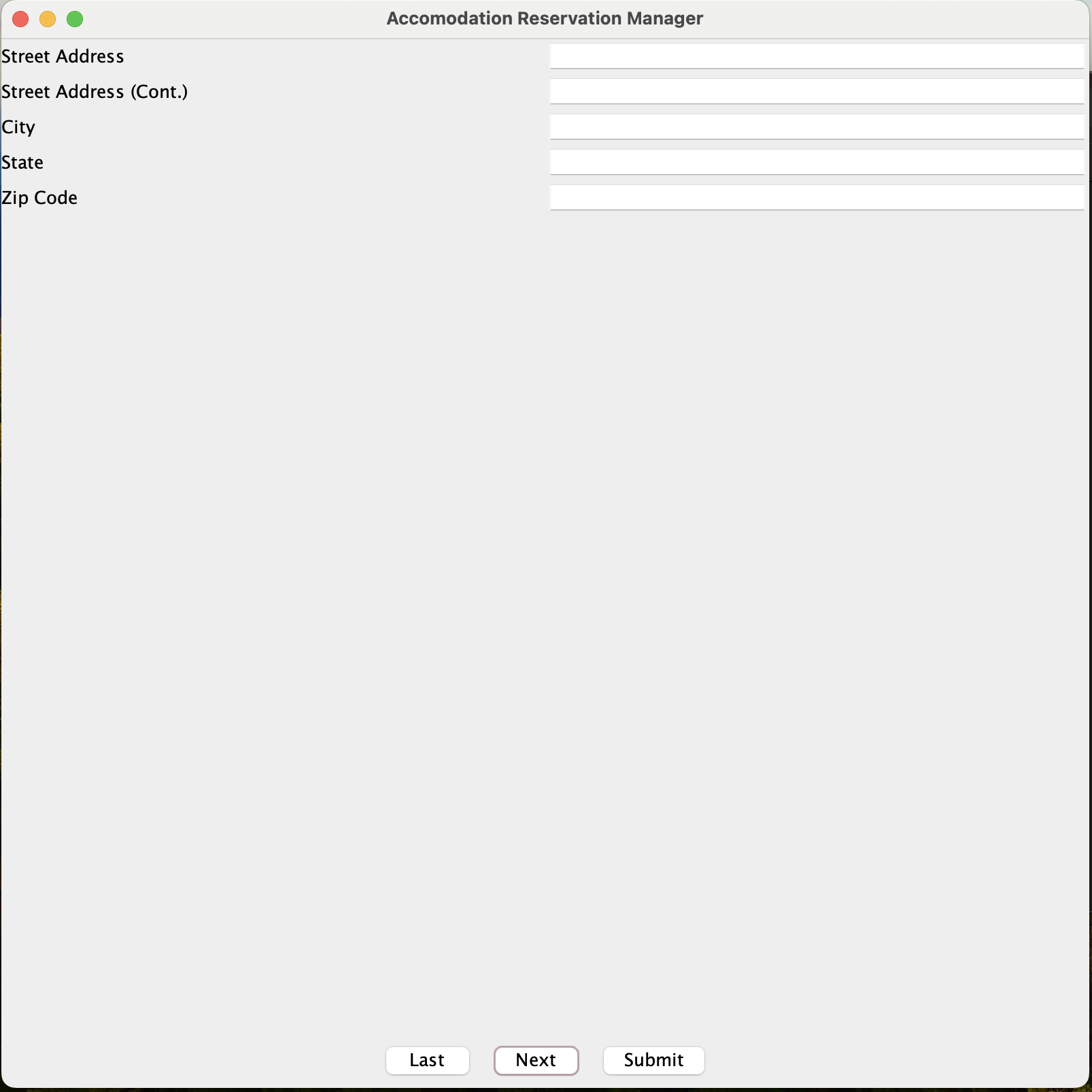
The accounts will be loaded on to the initial screen for the user to select. The will load the account by clicking the select button.

Create Account / Update Account Screen

The create account and update accounts look similar in interface. They are comprised of inputting the contact information and addresses of the account contact. See the figures below



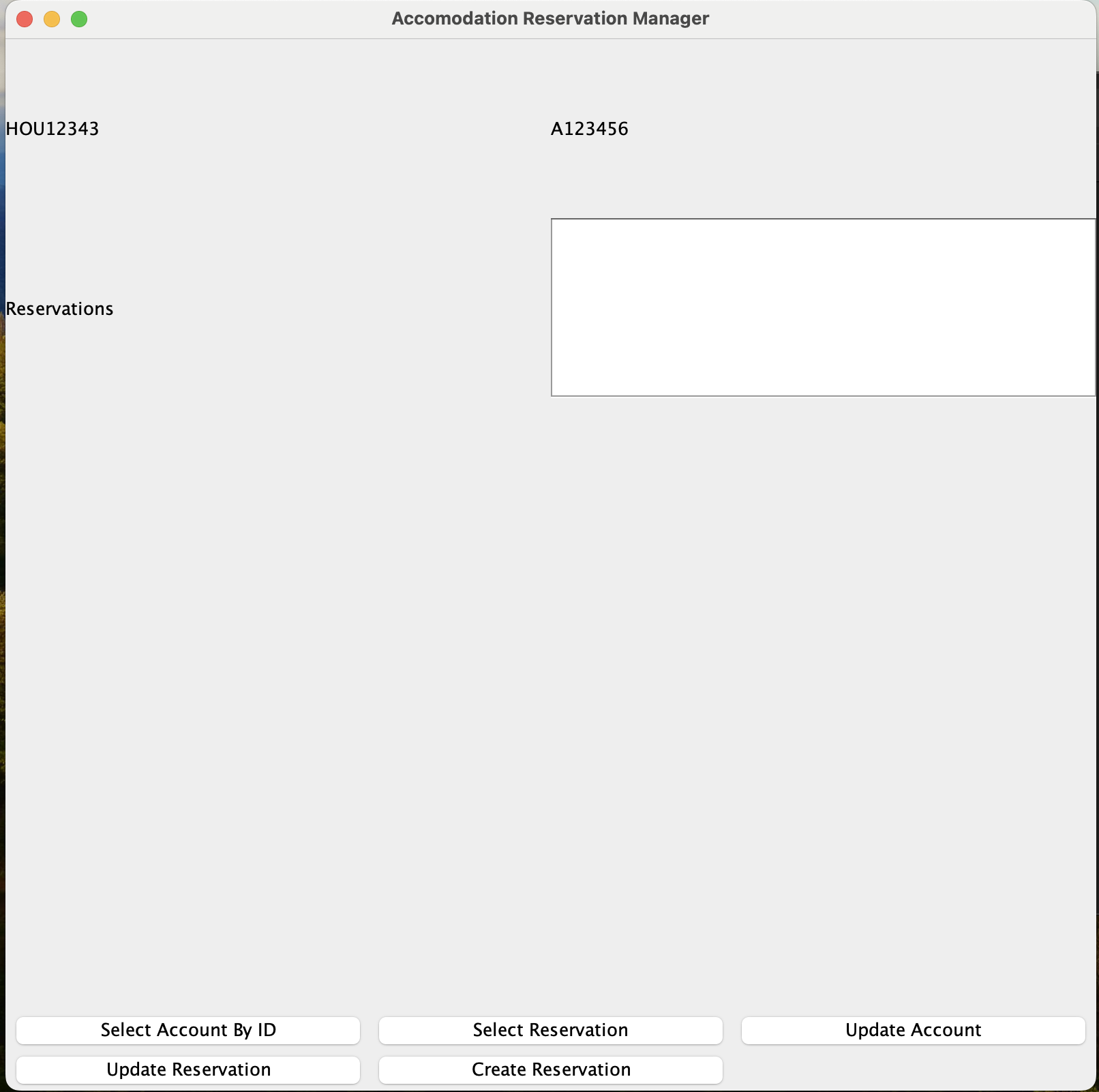
Contact Collection Screen



Address Collection Screen

View Account Info Screen

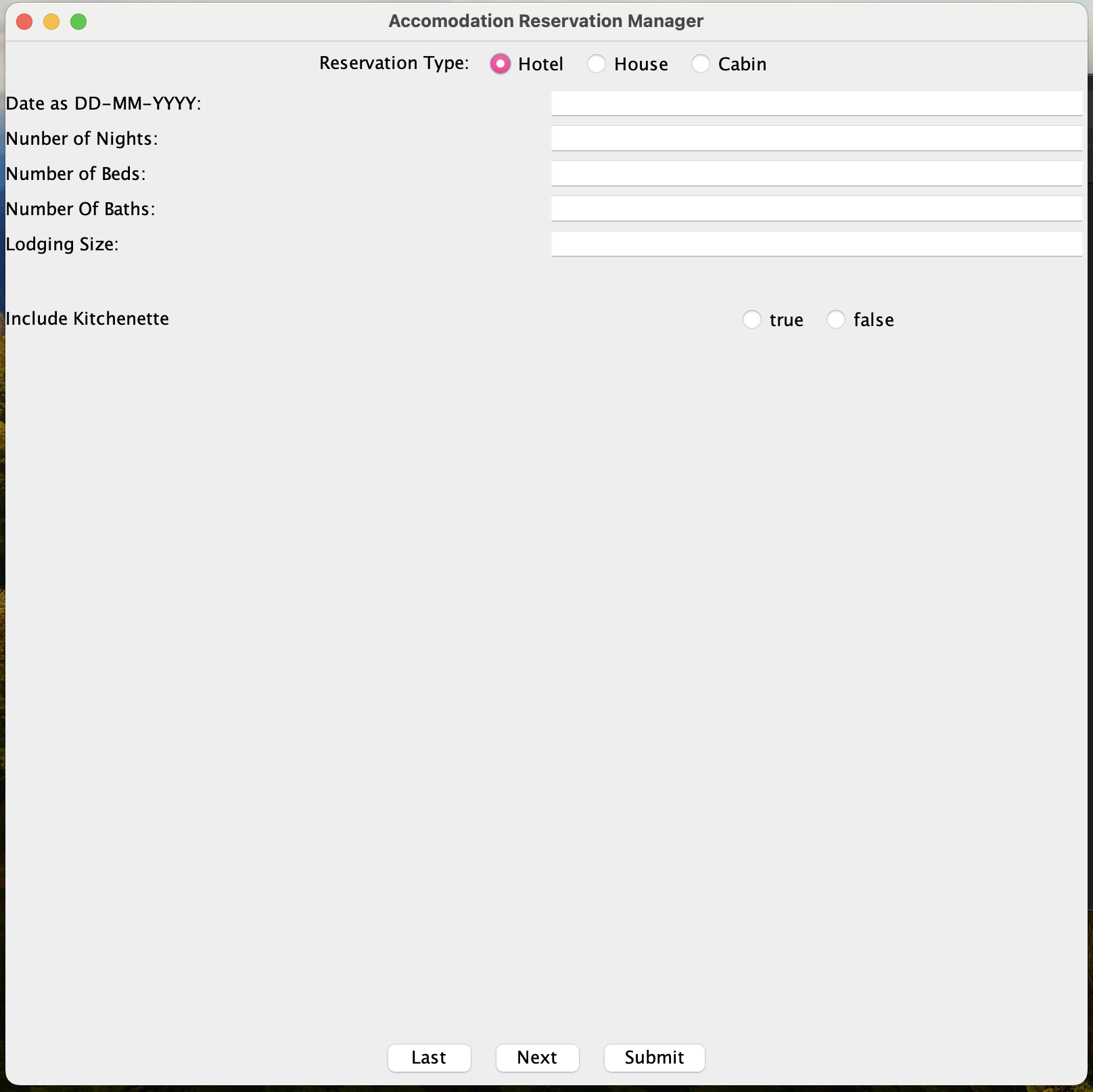
The account info screen gives an overview of the account reservations. Additionally, the user will be able to select, create, and update reservations from this screen. Similarly to the initial screen, the user will be able to select existing reservations to update from this screen.



Account View Screen

Create/Update Reservation Screen

The user will be able to create and update reservations. This screen is reactive to the type of reservation selected. It will dynamically generate the unique fields related to the hotel type when the reservation type radio button is selected.



Update/Create Reservation Screen

# **7 REQUIREMENTS MATRIX**

|  |  |  |  |
| --- | --- | --- | --- |
| Requirement | Class | Constructor/Method | Attribute |
| Account files name convention should be “acc-“ followed by the account number and the appropriate file extension | Account | SaveCurrentObject() | String accountFileName |
| The reservation file name convention should be “res-“ followed by the reservation number and appropriate file extension. | Reservation | SaveCurrentObject() | String reservationFileName |
| Each account’s data should be saved in a separate directory named as the account’s number. | Account | SaveCurrentObject() | String accountDirName |
| The account’s file should have all the reservation numbers associated with the account but no other reservation data. | Account |  | List<String> acctReservations |
| Manager class will then load all the account and their corresponding reservations data. | Manager | \_loadAllAccounts() |  |
| A new account can be added to the manager but it cannot be removed. | Manager | deleteObject |  |
| In addition, hotel reservation has an indication of whether there is kitchenette or not; cabin reservation has indication if there is full kitchen and if cabin includes a loft; and house reservation has the number of floors. | Cabin, Hotel, House |  | HasKitchenette,  HasLoft,  HasFullKitchen,  numberOfFloors |
| You can make the reservation number value have a prefix which is unique per the type of reservation. | ParseXML | GenerateUniqueID(String prefix) |  |
| hotel reservation can only be reserved for single bedroom, single bathroom, and two beds. | Hotel | \_checkIfValidHotel() |  |
| All reservation attributes must be given values on reservation creation except for the mailing address which may be null. If the mailing address is null, UI will know to use the physical address as mailing address. | Reservation, Hotel, Cabin, House | SaveCurrentObject() |  |
| Reservation price per night is calculated as follows.  (1) Basic price is $120 with an additional fee of $15 if the lodging size is greater than 900 square feet.  (2) Cabin has an additional fee of $20 for full kitchen and $5 for each additional bathroom  (3) Hotel has an additional flat fee of $50 plus $10 for kitchenette  Note that tax is already included in the price. | Reservation,Cabin,Hotel,House | CalculatePriceTotal() |  |
| The account and reservation files but must be human readable text files and you must follow **separation of concerns principle** for design and code reading/writing the files. | Reservation, Hotel, House, Cabin | ToString() |  |
| Retrieve a loaded account object that matches a specific account number | Manager | SelectAccountFromAll(int accountIndex) |  |
| Add new account object to the list managed by Manager (if account object already exists on add action with the same account number, it is considered an error) | Manager | CreateNewAccount() |  |
| Request that Manager updates specific account’s files with data stored in memory | Manager | UpdateObject(ParseXML objectTypeOf, List<Object> parameters |  |
| Add draft lodging reservation to an account (if reservation object already exists with the same reservation number, it is considered an error)  Complete reservation that is associated with an account | Manager | UpdateObject(ParseXML objectTypeOf) |  |
| Cancel reservation that is associated with an account | Manager | DeleteObject(ParseXML objectTypeOf, String identifierString) |  |
| Change reservation values that can be changed (if reservation is cancelled, completed, or for past date, it is considered an error) | Manager | UpdateObject(ParseXML objectTypeOf) |  |
| Request for price per night to be calculated and returned for a specific reservation | Reservation | CalculateDailyPrice() |  |
| Request for total reservation price to be calculated and returned for a specific reservation | Reservation | CalculatePriceTotal() |  |