Assignment Wk05-06: Spring and Maven

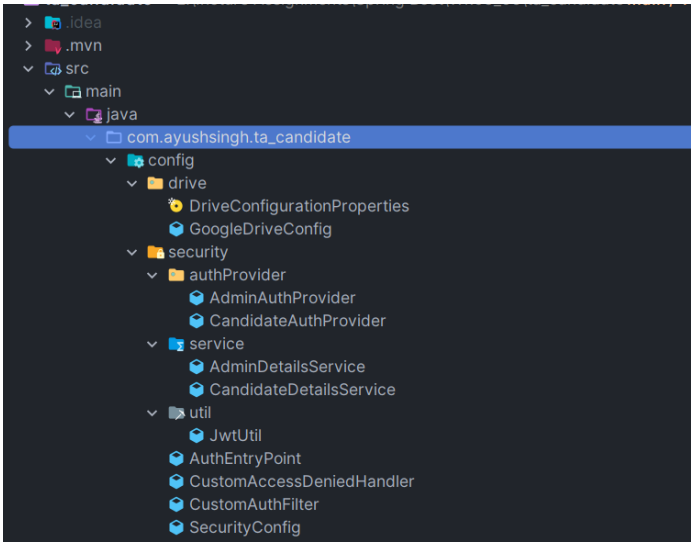
Problem statement –

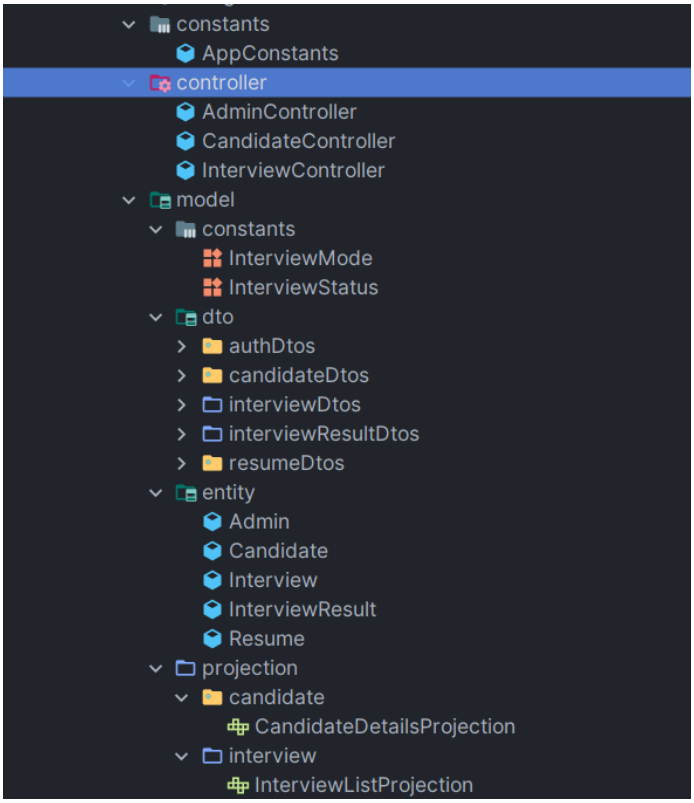
Company XYZ is in TA [Talent acquisition] business and is in need of a backend services for integrating with various UI components. It wants to publish Api(s) which will return JSON to be integrated with UI components. It already has UI components and only the api(s) need to be developed.

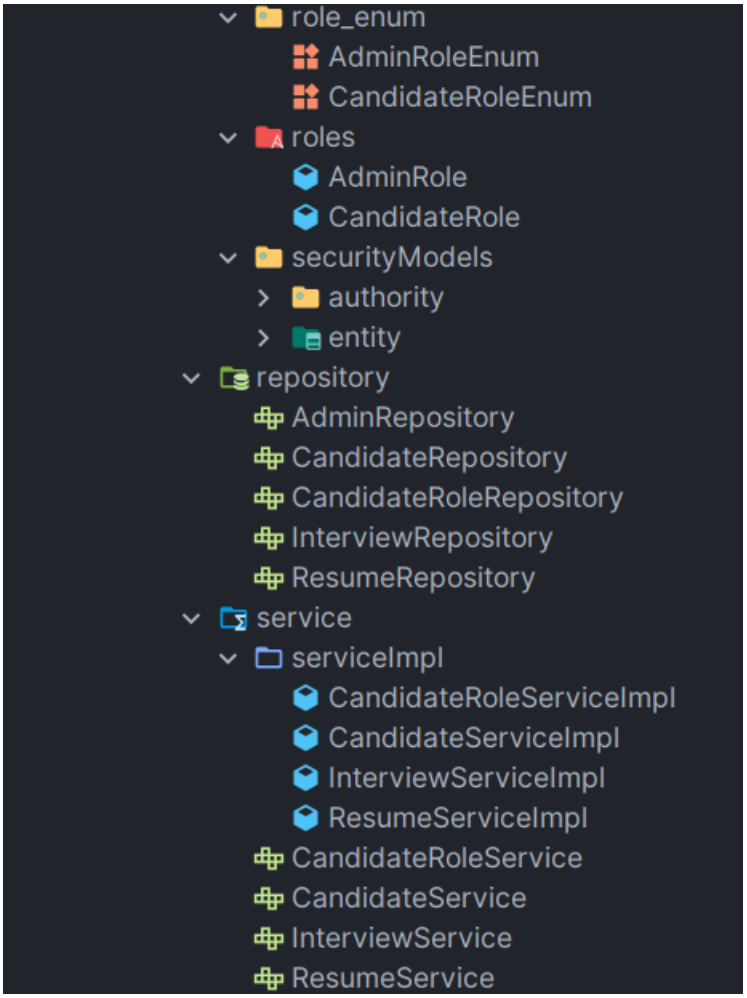
Following are the requirements –

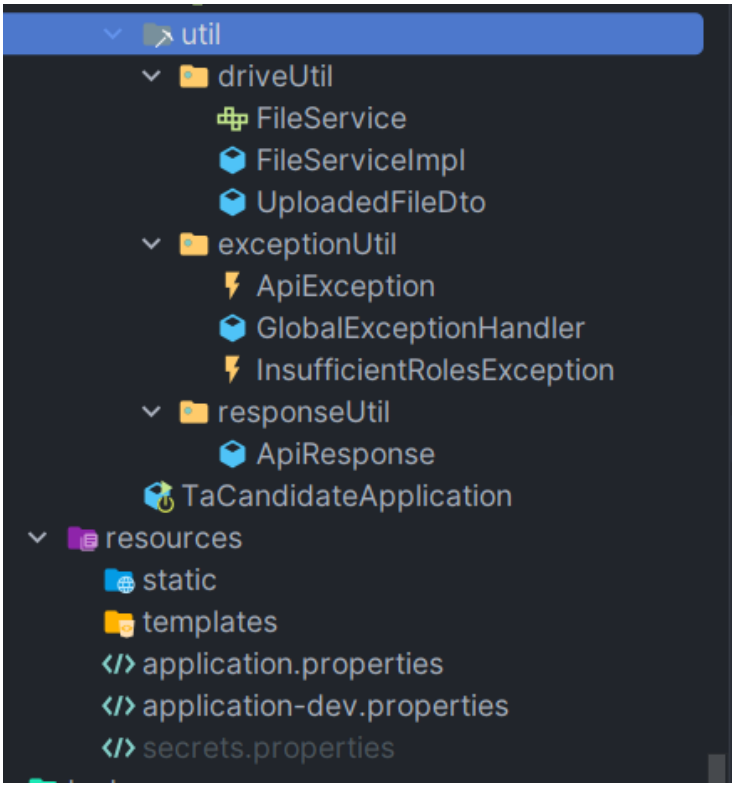
1. Facility for adding resumes of candidates
2. Facility for scheduling interviews
3. Facility for linking the resumes with interview results
4. Facility for search and look up of a candidate and his / her interview result

Project Structure









Entities in the project

1. Candidate: Candidate profile

```
package com.ayushsingh.ta_candidate.model.entity;

import com.ayushsingh.ta_candidate.model.roles.CandidateRole;
import jakarta.persistence.*;
import lombok.AllArgsConstructor;
import lombok.Getter;
```

```java
import lombok.NoArgsConstructor;
import lombok.Setter;
import org.hibernate.annotations.CreationTimestamp;
import org.hibernate.annotations.UpdateTimestamp;
import org.springframework.data.annotation.CreatedDate;
import org.springframework.data.annotation.LastModifiedDate;

import java.util.Date;
import java.util.HashSet;
import java.util.Set;
import java.util.UUID;

@Getter
@Setter
@NoArgsConstructor
@AllArgsConstructor
@Entity
@Table(name="ta_candidate")
public class Candidate {

    @Id
    @GeneratedValue(strategy = GenerationType.IDENTITY)
    @Column(name = "candidate_id")
    private Long candidateId;

    @Column(name="candidate_token",nullable = false,unique = true)
    private String candidateToken;

    @Column(name="first_name",nullable = false)
    private String firstName;

    @Column(name="last_name")
    private String lastName;

    @Column(name="password")
    private String password;

    @Column(name="email")
    private String email;

    @OneToOne(mappedBy = "candidate",cascade = CascadeType.ALL,orphanRemoval = true)
    private Resume resume;

    @ManyToMany(fetch = FetchType.EAGER)
    @JoinTable(name = "ta_candidate_candidate_role", joinColumns = @JoinColumn(name =
"candidate_id", referencedColumnName = "candidate_id"), inverseJoinColumns =
@JoinColumn(name = "role_id", referencedColumnName = "role_id"))
    private Set<CandidateRole> roles;

    @OneToMany(mappedBy = "candidate",cascade = CascadeType.ALL,fetch =
FetchType.LAZY,orphanRemoval = true)
    private Set<Interview> interviews=new HashSet<>();

    @CreatedDate
    @CreationTimestamp
    @Column(name = "created_at", nullable = false, updatable = false)
    private Date createdAt;

    @LastModifiedDate
    @UpdateTimestamp
    @Column(name = "updated_at")
    private Date updatedAt;

    @PrePersist
    public void generateToken() {
        if (this.candidateToken==null) {
            this.candidateToken=UUID.randomUUID().toString();
        }
    }
}
```

2. Admin: Admin of the talent acquisition system

```java
package com.ayushsingh.ta_candidate.model.entity;

import com.ayushsingh.ta_candidate.model.roles.AdminRole;
import jakarta.persistence.*;
import lombok.AllArgsConstructor;
import lombok.Getter;
import lombok.NoArgsConstructor;
import lombok.Setter;
import org.hibernate.annotations.CreationTimestamp;
import org.hibernate.annotations.UpdateTimestamp;
import org.springframework.data.annotation.CreatedDate;
import org.springframework.data.annotation.LastModifiedDate;

import java.util.Date;
import java.util.Set;
import java.util.UUID;

@Getter
@Setter
@NoArgsConstructor
@AllArgsConstructor
@Entity
@Table(name = "ta_admin")
public class Admin {

    @Id
    @GeneratedValue(strategy = GenerationType.IDENTITY)
    @Column(name = "admin_id")
    private Long adminId;

    @Column(name = "admin_token", nullable = false, unique = true)
    private String adminToken;

    @Column(name = "admin_email", nullable = false, unique = true)
    private String adminEmail;

    @Column(name = "admin_password", nullable = false)
    private String adminPassword;

    @ManyToMany(fetch = FetchType.EAGER)
    @JoinTable(name = "ta_admin_admin_role", joinColumns = @JoinColumn(name = "admin_id",
referencedColumnName = "admin_id"), inverseJoinColumns = @JoinColumn(name = "role_id",
referencedColumnName = "role_id"))
    private Set<AdminRole> roles;

    @CreatedDate
    @CreationTimestamp
    @Column(name = "created_at", nullable = false, updatable = false)
    private Date createdAt;

    @LastModifiedDate
    @UpdateTimestamp
    @Column(name = "updated_at")
    private Date updatedAt;

    @PrePersist
    public void generateToken() {
        if (this.adminToken == null) {
            this.adminToken = UUID.randomUUID().toString();
        }
    }
}
```

3. AdminRole and CandidateRole: Roles for admin and candidate

```java
package com.ayushsingh.ta_candidate.model.roles;
```

```java
import com.ayushsingh.ta_candidate.model.entity.Admin;
import jakarta.persistence.*;
import lombok.AllArgsConstructor;
import lombok.Getter;
import lombok.NoArgsConstructor;
import lombok.Setter;

import java.util.Objects;
import java.util.Set;

@Getter
@Setter
@NoArgsConstructor
@AllArgsConstructor
@Table(name = "ta_admin_role")
@Entity
public class AdminRole {
    @Id
    @GeneratedValue(strategy = GenerationType.IDENTITY)
    @Column(name = "role_id")
    private Long roleId;

    @Column(name = "role", nullable = false, unique = true)
    private String roleName;

    @ManyToMany(mappedBy = "roles")
    private Set<Admin> admins;

    @Override
    public boolean equals(Object o) {
        if (this == o) return true;
        if (o == null || getClass() != o.getClass()) return false;
        AdminRole adminRole = (AdminRole) o;
        return Objects.equals(roleId, adminRole.roleId) && Objects.equals(roleName,
adminRole.roleName);
    }

    @Override
    public int hashCode() {
        return Objects.hash(roleId, roleName);
    }
}
```

```java
package com.ayushsingh.ta_candidate.model.roles;

import com.ayushsingh.ta_candidate.model.entity.Candidate;
import jakarta.persistence.*;
import lombok.AllArgsConstructor;
import lombok.Getter;
import lombok.NoArgsConstructor;
import lombok.Setter;

import java.util.Objects;
import java.util.Set;

@Getter
@Setter
@NoArgsConstructor
@AllArgsConstructor
@Table(name = "ta_candidate_role")
@Entity
public class CandidateRole {
    @Id
    @GeneratedValue(strategy = GenerationType.IDENTITY)
    @Column(name = "role_id")
    private Long roleId;

    @Column(name = "role", nullable = false, unique = true)
```

```
    private String roleName;

    @ManyToMany(mappedBy = "roles")
    private Set<Candidate> candidates;

    @Override
    public boolean equals(Object o) {
        if (this == o) return true;
        if (o == null || getClass() != o.getClass()) return false;
        CandidateRole that = (CandidateRole) o;
        return Objects.equals(roleId, that.roleId) && Objects.equals(roleName,
that.roleName) && Objects.equals(candidates, that.candidates);
    }

    @Override
    public int hashCode() {
        return Objects.hash(roleName);
    }
}
```

4. Interview: Interview details

```
package com.ayushsingh.ta_candidate.model.entity;

import com.ayushsingh.ta_candidate.model.constants.InterviewMode;
import com.ayushsingh.ta_candidate.model.constants.InterviewStatus;
import jakarta.persistence.*;
import lombok.AllArgsConstructor;
import lombok.Getter;
import lombok.NoArgsConstructor;
import lombok.Setter;
import org.hibernate.annotations.CreationTimestamp;
import org.hibernate.annotations.UpdateTimestamp;
import org.springframework.data.annotation.CreatedDate;
import org.springframework.data.annotation.LastModifiedDate;

import java.time.LocalDateTime;
import java.time.ZonedDateTime;
import java.util.Date;

import java.util.UUID;

@Getter
@Setter
@NoArgsConstructor
@AllArgsConstructor
@Table(name="ta_interview")
@Entity
public class Interview {

    @Id
    @GeneratedValue(strategy = GenerationType.IDENTITY)
    @Column(name="interview_id")
    private Long interviewId;

    @Column(name = "interview_token",nullable = false,unique = true)
    private String interviewToken;

    @Column(name = "interview_subject",nullable = false,length = 500)
    private String interviewSubject;


    @Column(name = "meet_link",nullable = false,length = 500)
    private String meetLink;

   @ManyToOne(cascade = {CascadeType.MERGE,CascadeType.PERSIST,CascadeType.REFRESH},fetch =
FetchType.LAZY)
   @JoinColumn(name="candidate_id",referencedColumnName = "candidate_id")
    private Candidate candidate;
```

```
    @OneToOne(mappedBy = "interview",cascade = CascadeType.ALL,orphanRemoval = true)
    private InterviewResult interviewResult;

     @Column(name = "meet_time")
    private ZonedDateTime meetTime;

     @Column(name="interview_status",nullable = false)
     @Enumerated(value=EnumType.STRING)
     private InterviewStatus interviewStatus;

     @Column(name="interview_mode",nullable = false)
     @Enumerated(EnumType.STRING)
     private InterviewMode interviewMode;

     @CreatedDate
     @CreationTimestamp
     @Column(name = "created_at", nullable = false, updatable = false)
     private Date createdAt;

     @LastModifiedDate
     @UpdateTimestamp
     @Column(name = "updated_at")
     private Date updatedAt;

     @PrePersist
     public void generateToken() {
         if (this.interviewToken==null) {
             this.interviewToken= UUID.randomUUID().toString();
         }
     }
}
```

5. InterviewResult: Result of interview

```
package com.ayushsingh.ta_candidate.model.entity;

import jakarta.persistence.*;
import lombok.AllArgsConstructor;
import lombok.Getter;
import lombok.NoArgsConstructor;
import lombok.Setter;
import org.hibernate.annotations.CreationTimestamp;
import org.hibernate.annotations.UpdateTimestamp;
import org.springframework.data.annotation.CreatedDate;
import org.springframework.data.annotation.LastModifiedDate;

import java.util.Date;
import java.util.UUID;

@Getter
@Setter
@NoArgsConstructor
@AllArgsConstructor
@Entity
@Table(name = "ta_interview_result")
public class InterviewResult {

     @Id
     @GeneratedValue(strategy = GenerationType.IDENTITY)
     @Column(name = "interview_result_id")
     private Long interviewResultId;

     @Column(name="interview_result_token",nullable = false,unique = true)
     private String interviewResultToken;

     @OneToOne(fetch = FetchType.LAZY)
     @JoinColumn(name = "interview_id",referencedColumnName = "interview_id")
     private Interview interview;
```

```
    @Column(name="feedback",nullable = false,length = 500)
    private String feedback;

    @Column(name="decision",nullable = false)
    private String decision;

    @CreatedDate
    @CreationTimestamp
    @Column(name = "created_at", nullable = false, updatable = false)
    private Date createdAt;

    @LastModifiedDate
    @UpdateTimestamp
    @Column(name = "updated_at")
    private Date updatedAt;

    @PrePersist
    public void generateToken() {
        if (this.interviewResultToken == null) {
            this.interviewResultToken = UUID.randomUUID().toString();
        }
    }

}
```

6. Resume: Resume details

```
package com.ayushsingh.ta_candidate.model.entity;

import jakarta.persistence.*;
import lombok.AllArgsConstructor;
import lombok.Getter;
import lombok.NoArgsConstructor;
import lombok.Setter;
import org.hibernate.annotations.CreationTimestamp;
import org.hibernate.annotations.UpdateTimestamp;
import org.springframework.data.annotation.CreatedDate;
import org.springframework.data.annotation.LastModifiedDate;

import java.util.Date;
import java.util.UUID;

@Getter
@Setter
@NoArgsConstructor
@AllArgsConstructor
@Table(name="ta_resume")
@Entity
public class Resume {

    @Id
    @GeneratedValue(strategy = GenerationType.IDENTITY)
    @Column(name="document_id")
    private Long documentId;

    @Column(name="alert_token",nullable = false,unique = true)
    private String documentToken;

    @Column(name="document_name",nullable = false)
    private String documentName;

    @Column(name="format",nullable = false)
    private String format;

    @Column(name="document_url",nullable = false)
    private String documentUrl;

    @OneToOne(cascade = {CascadeType.MERGE,CascadeType.PERSIST,CascadeType.DETACH},fetch =
FetchType.LAZY)
```

```
    @JoinColumn(name="candidate_id",nullable = false)
    private Candidate candidate;

    @CreatedDate
    @CreationTimestamp
    @Column(name = "created_at", nullable = false, updatable = false)
    private Date createdAt;

    @LastModifiedDate
    @UpdateTimestamp
    @Column(name = "updated_at")
    private Date updatedAt;

}
```

Utility classes and enums

1. AdminRoleEnum and CandidateRole Enum represent the admin and candidate roles.
2. InterviewMode and InterviewStatus represent the mode and status of interview respectively.
3. Projections are used to selectively fetch data from database tables.

Security Configuration

1. Spring Security with Json Web Token is used to protect API.
2. The APIs for login and register are kept publicly accessible.
3. There are two types of users- SUPER_ADMIN and CANDIDATE. Therefore, role based access is used to further apply authorization.

Dependencies

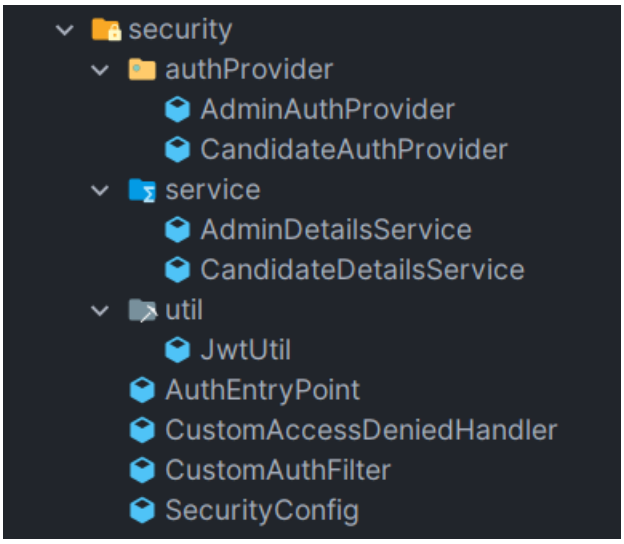
1. Add the Spring Security dependency.

```
<dependency>
    <groupId>org.springframework.boot</groupId>
    <artifactId>spring-boot-starter-security</artifactId>
</dependency>
```

2. Add the JWT dependency

```
<dependency>
    <groupId>io.jsonwebtoken</groupId>
    <artifactId>jjwt</artifactId>
    <version>0.9.1</version>
</dependency>
```

Configuration



1. SecurityConfig: Configuration of Spring Security.

```
package com.ayushsingh.ta_candidate.config.security;

@Configuration
@EnableWebSecurity
@EnableMethodSecurity
@RequiredArgsConstructor
public class SecurityConfig {


    private final AuthenticationEntryPoint authEntryPoint;
    private final CandidateAuthProvider candidateAuthProvider;
    private final AdminAuthProvider adminAuthProvider;
    private final CustomAccessDeniedHandler customAccessDeniedHandler;


    public AuthenticationManager authManager(HttpSecurity http) throws Exception {
        AuthenticationManagerBuilder authenticationManagerBuilder =
http.getSharedObject(AuthenticationManagerBuilder.class);

authenticationManagerBuilder.authenticationProvider(candidateAuthProvider).authentication
Provider(adminAuthProvider);

        return authenticationManagerBuilder.build();
    }


    @Bean
    public CustomAuthFilter customAuthenticationFilter(HttpSecurity http) throws
Exception {
        return new CustomAuthFilter(authManager(http));
    }


    @Bean
    public SecurityFilterChain filterChain(HttpSecurity http) throws Exception {

        http.cors().configurationSource(request -> {
            CorsConfiguration configuration = new CorsConfiguration();
            configuration.setAllowedOrigins(List.of("*"));
            configuration.setAllowedMethods(List.of("HEAD", "GET", "POST", "PUT",
"DELETE", "PATCH", "OPTIONS"));
            configuration.setAllowCredentials(true);
            configuration.addExposedHeader("Message");
            configuration.setAllowedHeaders(List.of("Authorization", "Cache-Control",
"Content-Type"));
            return configuration;
        })
                .and()
                .csrf()
```

```
                .disable()
                .authorizeHttpRequests()
                .requestMatchers(AppConstants.PUBLIC_URLS).permitAll()
                .anyRequest().authenticated()
                .and()
                .exceptionHandling()
                .authenticationEntryPoint(authEntryPoint)
                .accessDeniedHandler(customAccessDeniedHandler)
                .and()

.sessionManagement().sessionCreationPolicy(SessionCreationPolicy.STATELESS);

        http.addFilterBefore(customAuthenticationFilter(http),
UsernamePasswordAuthenticationFilter.class);

        return http.build();
    }
}
```

2. CustomAuthFilter: Custom filter to handle login functionality and jwt verification.

```
@Slf4j
public class CustomAuthFilter extends OncePerRequestFilter {

    private final AuthenticationManager authenticationManager;
    @Autowired
    @Qualifier("handlerExceptionResolver")
    private HandlerExceptionResolver exceptionResolver;

    @Autowired
    private CandidateDetailsService candidateDetailsService;

    @Autowired
    private AdminDetailsService adminDetailsService;


    public CustomAuthFilter(AuthenticationManager authenticationManager) {
        this.authenticationManager = authenticationManager;
    }

    @Override
    protected void doFilterInternal(HttpServletRequest request, HttpServletResponse
response, FilterChain filterChain) throws ServletException, IOException {
        String uri = request.getRequestURI(); //-get the uri
        //-if the uri is a login uri, then login
        if (uri.endsWith(AppConstants.SIGN_IN_URI_ENDING)) {
            //-obtain username and password
            LoginRequestDto jwtAuthRequest = new
ObjectMapper().readValue(request.getInputStream(), LoginRequestDto.class);
            String username = jwtAuthRequest.getUsername();
            String password = jwtAuthRequest.getPassword();
            UsernamePasswordAuthenticationToken authenticationToken = new
UsernamePasswordAuthenticationToken(username, password);
            Authentication authenticationResult = null;
            try {
                authenticationResult =
this.authenticationManager.authenticate(authenticationToken);

            } catch (AuthenticationException e) {


SecurityContextHolder.getContext().setAuthentication(UsernamePasswordAuthenticationToken.
unauthenticated(username, password));
                exceptionResolver.resolveException(request, response, null, e);
            }
            if (authenticationResult != null) {

SecurityContextHolder.getContext().setAuthentication(authenticationResult);
            }

            filterChain.doFilter(request, response);
```

```
        }
        //-if not a login uri, check for access token
        else {
            String headerToken =null;
                headerToken = request.getHeader(AUTH_HEADER); //-if no token, obtain
token from header
            //-if still not found, return
            if (headerToken == null) {
                log.info("Access token is not present");
                //-match uri with public urls
              try{
                  boolean isPublicUrl =
Arrays.stream(PUBLIC_URLS).anyMatch(uri::endsWith);
                  if(isPublicUrl) {
                      filterChain.doFilter(request, response);
                      return;
                  }
                  else{
                      throw new ApiException("Access token is not present");
                  }
              }
              catch (ApiException e){
                  exceptionResolver.resolveException(request, response, null, e);
                  return;
              }
            }
            UserDetails userDetails = null;
            try {
                headerToken = StringUtils.delete(headerToken,
AppConstants.BEARER_TOKEN_PREFIX).trim();
                String entityType = JwtUtil.extractEntityType(headerToken);
                String username = JwtUtil.extractUsername(headerToken);
                if (username != null &&
SecurityContextHolder.getContext().getAuthentication() == null) {
                    if (entityType.equals(AppConstants.ENTITY_TYPE_CANDIDATE)) {
                        userDetails =
this.candidateDetailsService.loadUserByUsername(username);
                    }
                    else if(entityType.equals(AppConstants.ENTITY_TYPE_ADMIN)){
                        userDetails =
this.adminDetailsService.loadUserByUsername(username);
                    }
                    if (userDetails == null) {
                        throw new ApiException("User not found with username: " +
username);
                    } else if (JwtUtil.validateToken(headerToken, userDetails)) {
                        UsernamePasswordAuthenticationToken
usernamePasswordAuthenticationToken = new
UsernamePasswordAuthenticationToken(userDetails, null, userDetails.getAuthorities());
                        usernamePasswordAuthenticationToken.setDetails(new
WebAuthenticationDetailsSource().buildDetails(request));

SecurityContextHolder.getContext().setAuthentication(usernamePasswordAuthenticationToken)
;
                        filterChain.doFilter(request, response);
                    } else {
                        throw new ApiException("Token validation returned false");
                    }
                } else {
                    throw new ApiException("Username not found in token");
                }
            } catch (ExpiredJwtException | AccessDeniedException |
UnsupportedJwtException | MalformedJwtException |
                     SignatureException | IllegalArgumentException | ApiException |
InsufficientRolesException e) {

SecurityContextHolder.getContext().setAuthentication(UsernamePasswordAuthenticationToken.
unauthenticated(userDetails, null));
                exceptionResolver.resolveException(request, response, null, e);
            }
        }
```

```
    }


}
```

3. JwtUtil: Utility class to handle JWT.

```
public class JwtUtil {

    public static String extractUsername(String token) {
        String subject = extractClaim(token, Claims::getSubject);
        System.out.println("Extracted subject: " + subject);
        return subject;
    }

    public static String extractEntityType(String token){
        final Claims claims=extractAllClaims(token);
        return (String) claims.get(AppConstants.ENTITY_TYPE);
    }

    public static Date extractExpiration(String token) {
        return extractClaim(token, Claims::getExpiration);
    }

    public static <T> T extractClaim(String token, Function<Claims, T> claimsResolver) {
        final Claims claims = extractAllClaims(token);
        return claimsResolver.apply(claims);
    }

    private static Claims extractAllClaims(String token) {

        Claims parsedClaims =
Jwts.parser().setSigningKey(AppConstants.SECRET_KEY).parseClaimsJws(token).getBody();
        System.out.println("Parsed Claims: " + parsedClaims.getSubject());
        return parsedClaims;
    }

    private static Boolean isTokenExpired(String token) {
        return extractExpiration(token).before(new Date());
    }

    public static String generateToken(String username, String entityType) {
        Map<String, Object> claims = new HashMap<>();
        claims.put(AppConstants.ENTITY_TYPE,entityType);
        return createToken(claims, username);
    }

    private static String createToken(Map<String, Object> claims, String subject) {
        Date issueDate = new Date(System.currentTimeMillis());
        System.out.println("issueDate: " + issueDate + " time: " + issueDate.getTime() +
" issueDate formatted: "
                + issueDate);
        Date expirationDate = new Date(System.currentTimeMillis() +
AppConstants.ACCESS_TOKEN_EXPIRATION_TIME
        );
        System.out.println("Expiration date: " + expirationDate + " formatted: " +
expirationDate);
        return
Jwts.builder().setClaims(claims).setSubject(subject).setIssuedAt(issueDate)
                .setExpiration(expirationDate)
                .signWith(SignatureAlgorithm.HS256, AppConstants.SECRET_KEY).compact()
                ;
    }


    public static Boolean validateToken(String token, UserDetails userDetails) {
        final String username = extractUsername(token);
        boolean isUsernameValid = username.equals(userDetails.getUsername());
        boolean isJwtTtokenExpired = isTokenExpired(token);
        System.out.println("Is token expired: " + isJwtTtokenExpired + " is username
valid: " + isUsernameValid);
```

```
        if (!isUsernameValid) {
            System.out.println("Username in the token is invalid");
        }
        if (isJwtTtokenExpired) {
            System.out.println("Token is expired!");
        }
        return (isUsernameValid && !isJwtTtokenExpired);
    }

    public static String[] decodedBase64(String token) {

        byte[] decodedBytes = Base64.getDecoder().decode(token);
        String pairedCredentials = new String(decodedBytes);

        return pairedCredentials.split(":", 2);

    }

}
```

4. AdminDetailsService and CandidateDetailsService: UserDetailsService implementations for Admin and Candidate

```
package com.ayushsingh.ta_candidate.config.security.service;



@Service
@RequiredArgsConstructor
public class AdminDetailsService implements UserDetailsService {

    private final AdminRepository adminRepository;
    @Override
    public UserDetails loadUserByUsername(String username) throws UsernameNotFoundException
{
        Optional<Admin> admin =adminRepository.findByAdminEmail(username);

        return admin.map(SecurityAdmin::new).orElse(null);
    }
}
```

```
package com.ayushsingh.ta_candidate.config.security.service;


@Service
@RequiredArgsConstructor
public class CandidateDetailsService implements UserDetailsService {


    private final CandidateRepository candidateRepository;
    @Override
    public UserDetails loadUserByUsername(String username) throws UsernameNotFoundException
{
        Optional<Candidate> candidate = candidateRepository.findByCandidateEmail(username);

        return candidate.map(SecurityCandidate::new).orElse(null);
    }
}
```

5. AdminAuthProvider and CandidateAuthProvider: AuthenticationProvider implementations for Admin and Candidate

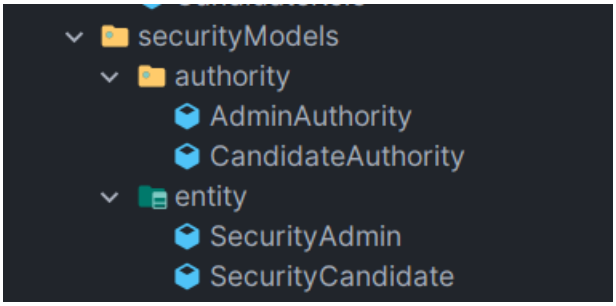
```
package com.ayushsingh.ta_candidate.config.security.authProvider;


@RequiredArgsConstructor
@Component
public class AdminAuthProvider implements AuthenticationProvider {
```

```java
    private final AdminDetailsService adminDetailsService;
    private final PasswordEncoder passwordEncoder;


    @Override
    public Authentication authenticate(Authentication authentication) throws
AuthenticationException {
        String username = String.valueOf(authentication.getPrincipal());
        String password = String.valueOf(authentication.getCredentials());

        UserDetails adminDetails = adminDetailsService.loadUserByUsername(username);
        if (adminDetails != null) {
            if (passwordEncoder.matches(password, adminDetails.getPassword())) {

                return new UsernamePasswordAuthenticationToken(username, password,
adminDetails.getAuthorities());

            }
        }
        throw new BadCredentialsException("Wrong Credentials");
    }

    @Override
    public boolean supports(Class<?> authentication) {
        return UsernamePasswordAuthenticationToken.class.equals(authentication);
    }
}
package com.ayushsingh.ta_candidate.config.security.authProvider;


@RequiredArgsConstructor
@Component
public class CandidateAuthProvider implements AuthenticationProvider {

    private final CandidateDetailsService candidateDetailsService;
    private final PasswordEncoder passwordEncoder;
    @Override
    public Authentication authenticate(Authentication authentication) throws
AuthenticationException {
        String username = String.valueOf(authentication.getPrincipal());
        String password=String.valueOf(authentication.getCredentials());

        UserDetails candidateDetails = candidateDetailsService.loadUserByUsername(username);
        if(candidateDetails!=null){
            if(passwordEncoder.matches(password,candidateDetails.getPassword())){

                    return new
UsernamePasswordAuthenticationToken(username,password,candidateDetails.getAuthorities());

            }
        }
        throw new BadCredentialsException("Wrong Credentials");
    }

    @Override
    public boolean supports(Class<?> authentication) {
        return UsernamePasswordAuthenticationToken.class.equals(authentication);
    }
}
```

6. AuthEntryPoint and CustomAccessDeniedHandler are used for exception handling.

Security models

Instead of directly using the entity classes as implementations of UserDetails, we can create separate classes to handle the UserDetails method implementations and Granted Authorities (roles for users).



1. SecurityAdmin

```
package com.ayushsingh.ta_candidate.model.securityModels.entity;

import com.ayushsingh.ta_candidate.model.entity.Admin;
import lombok.AllArgsConstructor;
import org.springframework.security.core.GrantedAuthority;
import org.springframework.security.core.authority.SimpleGrantedAuthority;
import org.springframework.security.core.userdetails.UserDetails;

import java.util.Collection;
import java.util.stream.Collectors;

@AllArgsConstructor
public class SecurityAdmin implements UserDetails {

    private final Admin admin;

    @Override
    public Collection<? extends GrantedAuthority> getAuthorities() {
        return admin.getRoles()
                .stream()
                .map(role -> new SimpleGrantedAuthority(role.getRoleName()))
                .collect(Collectors.toList());
    }

    @Override
    public String getPassword() {
        return this.admin.getAdminPassword();
    }

    @Override
    public String getUsername() {
        return this.admin.getAdminEmail();
    }

    @Override
    public boolean isAccountNonExpired() {
        return true;
    }

    @Override
    public boolean isAccountNonLocked() {
        return true;
    }

    @Override
    public boolean isCredentialsNonExpired() {
        return true;
    }

    @Override
    public boolean isEnabled() {
        return true;
    }
}
```

2. SecurityCandidate

```java
package com.ayushsingh.ta_candidate.model.securityModels.entity;


import com.ayushsingh.ta_candidate.model.entity.Candidate;
import com.ayushsingh.ta_candidate.model.roles.CandidateRole;
import lombok.AllArgsConstructor;
import org.springframework.security.core.GrantedAuthority;
import org.springframework.security.core.authority.SimpleGrantedAuthority;
import org.springframework.security.core.userdetails.UserDetails;

import java.util.Collection;
import java.util.stream.Collectors;

@AllArgsConstructor
public class SecurityCandidate implements UserDetails {
    private final Candidate candidate;

    @Override
    public Collection<? extends GrantedAuthority> getAuthorities() {
        return candidate.getRoles()
                .stream()
                .map(role -> new SimpleGrantedAuthority(role.getRoleName()))
                .collect(Collectors.toList());
    }

    @Override
    public String getPassword() {
        return this.candidate.getPassword();
    }

    @Override
    public String getUsername() {
        return this.candidate.getEmail();
    }

    @Override
    public boolean isAccountNonExpired() {
        return true;
    }

    @Override
    public boolean isAccountNonLocked() {
        return true;
    }

    @Override
    public boolean isCredentialsNonExpired() {
        return true;
    }

    @Override
    public boolean isEnabled() {
        return true;
    }
}
```

3. AdminAuthority

```java
package com.ayushsingh.ta_candidate.model.securityModels.authority;

import com.ayushsingh.ta_candidate.model.roles.AdminRole;
import lombok.AllArgsConstructor;
import org.springframework.security.core.GrantedAuthority;

@AllArgsConstructor
public class AdminAuthority implements GrantedAuthority {
    private final AdminRole adminRole;

    @Override
    public String getAuthority() {
        return this.adminRole.getRoleName();
```

```
    }
}
```

4. CandidateAuthority

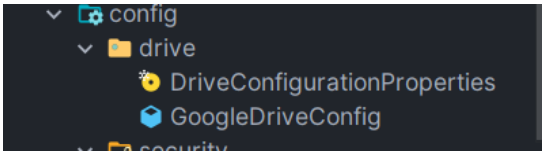
```
package com.ayushsingh.ta_candidate.model.securityModels.authority;

import com.ayushsingh.ta_candidate.model.roles.CandidateRole;
import lombok.AllArgsConstructor;
import org.springframework.security.core.GrantedAuthority;

@AllArgsConstructor
public class CandidateAuthority implements GrantedAuthority {

    private final CandidateRole candidateRole;

    @Override
    public String getAuthority() {
        return this.candidateRole.getRoleName();
    }

}
```

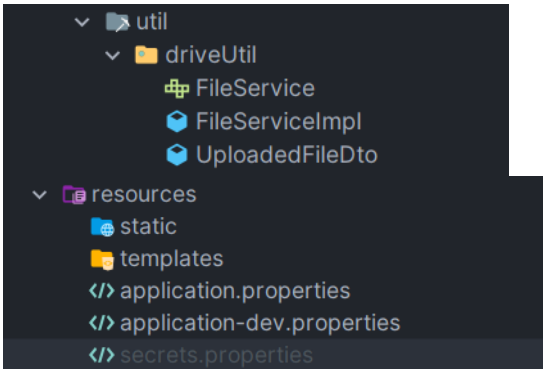
Exception Handling

1. GlobalExceptionHandler is used to handle responses for custom and predefined exceptions.
2. ApiResponse: A generic class to provide response body.

File Handling and Constants

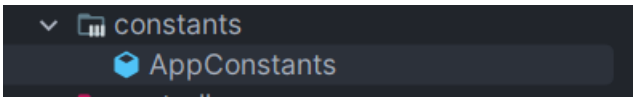
1. In order to store the resume documents, we can use Google Drive API to upload the resumes to a Google Drive Folder.
2. For this purpose we need to add the configurations and secrets for Google Drive.





secrets.properties: This file holds the folder id for the storage folder.

3. AppConstants file hold the constants like response codes, public urls and jwt secret key. (In production, this key must be added to environment variable and not pushed to repository)



APIs

For all the endpoints other than register and login, we will have to pass the Bearer token in the authorization header.

Candidate

```
package com.ayushsingh.ta_candidate.controller;


@RestController
@RequestMapping("/api/v1/candidate")
@RequiredArgsConstructor
public class CandidateController {

    private final CandidateService candidateService;
    private final ResumeService resumeService;

    @PostMapping("/new")
    public ResponseEntity<ApiResponse<String>> newCandidate(@RequestBody CandidateCreateDto
candidateCreateDto) {
        String token = candidateService.createNewCandidate(candidateCreateDto);
        return new ResponseEntity<>(new ApiResponse<>(token), HttpStatus.CREATED);
    }

    @PostMapping("/login")
    public ResponseEntity<ApiResponse<LoginResponseDto>> login() {
        if (SecurityContextHolder.getContext().getAuthentication().isAuthenticated()) {
            String username = (String)
SecurityContextHolder.getContext().getAuthentication().getPrincipal();
            String accessToken = JwtUtil.generateToken(username,
AppConstants.ENTITY_TYPE_CANDIDATE);
            LoginResponseDto loginResponseDto = new LoginResponseDto();
            loginResponseDto.setAccessToken(accessToken);
            loginResponseDto.setUsername(username);
            return new ResponseEntity<>(new ApiResponse<>(loginResponseDto), HttpStatus.OK);

        }
        throw new ApiException("User authentication failed!");
    }

    @GetMapping("/details")
    public ResponseEntity<ApiResponse<CandidateDetailsProjection>>
candidateDetails(@RequestParam(value = "candidateEmail") String candidateEmail) {
        return new ResponseEntity<>(new
ApiResponse<>(candidateService.getCandidateDetails(candidateEmail)), HttpStatus.OK);
    }

    @PreAuthorize("hasRole('ROLE_CANDIDATE')")
    @PostMapping("/resume/upload")
    public ResponseEntity<ApiResponse<String>> uploadFile(@RequestParam("candidateToken")
String candidateToken, @RequestPart("file") MultipartFile multipartFile) {
        return new ResponseEntity<>(new
ApiResponse<>(resumeService.uploadResume(candidateToken, multipartFile)),
HttpStatus.CREATED);
    }
}
```

1. Register Candidate

POST: http://localhost:8085/api/v1/candidate/new

Request Body:

```
{
    "firstName": "Ayush",
    "lastName" : "Singh",
    "password": "123abc",
    "email": "ayushsingh20november@gmail.com"
}
```

Response Body:

```
{
    "code": 2000,
    "message": "Success",
    "data": "b8a03130-af06-40f5-aee6-de2d790768b4"
}
```

2. Candidate Login

POST: http://localhost:8085/api/v1/candidate/login

Request Body:

```
{
    "username": "ayushsingh20november@gmail.com",
    "password": "123abc"
}
```

Response Body:

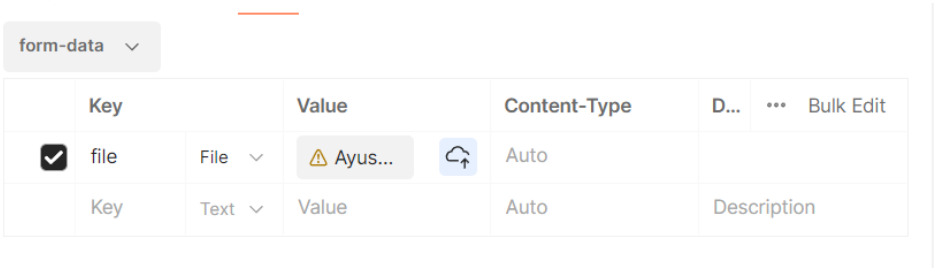

```
{
    "code": 2000,
    "message": "Success",
    "data": {
        "accessToken":
"eyJhbGciOiJIUzI1NiJ9.eyJzdWIiOiJheXVzaHNpbmdoMjBub3ZlbWJlckBnbWFpbC5jb20iLCJleHAiOjE3MTE0NjcxNzMsIkVO
VElUWV9UWVBFIjoiQ0FORElEQVRFIiwiaWF0IjoxNzExNDMxMTczfQ.R0Phsn29h_Wm08b88u27O-BV8xh9zyTg5uZGzVcAp2I",
        "username": "ayushsingh20november@gmail.com"
    }
}
```


Note- The access token is the jwt token which must be used for all protected candidate endpoints. For now, this token will be sent as a Bearer Token in the authorization header, but for better protection and security, we can use **HttpOnly Cookie** to store this token, along with a short expiry time for access token and use a refresh token to obtain a new token.

3. Upload resume

POST: http://localhost:8085/api/v1/candidate/resume/upload?candidateToken=b8a03130-af06-40f5-aee6-de2d790768b4

Request Body:



Response Body:

```
{
```

```
    "code": 2000,
    "message": "Success",
    "data": "1TdLl6LJNVP517AQlRksJN8hXHm3dp_K0"
}
```


4. Get candidate details

GET:
http://localhost:8085/api/v1/candidate/details?candidateEmail=ayushsingh20november@gmail.com

Response Body:


```
{
    "code": 2000,
    "message": "Success",
    "data": {
        "token": "b8a03130-af06-40f5-aee6-de2d790768b4",
        "email": "ayushsingh20november@gmail.com",
        "firstName": "Ayush",
        "lastName": "Singh",
        "documentToken": "1TdLl6LJNVP517AQlRksJN8hXHm3dp_K0",
        "resumeUrl": "https://drive.google.com/file/d/1TdLl6LJNVP517AQlRksJN8hXHm3dp_K0"
    }
}
```


Admin

1. Admin Login

POST: http://localhost:8085/api/v1/admin/login

Request Body:


```
{
    "username":"ayush20april@gmail.com",
    "password": "123abc"
}
```


Response Body:


```
{
    "code": 2000,
    "message": "Success",
    "data": {
        "accessToken":
"eyJhbGciOiJIUzI1NiJ9.eyJzdWIiOiJheXVzaDIwYXByaWxAZ21haWwuY29tIiwiZXhwIjoxNzExNDY4NzA2LCJFTlRJVFlfVFlQ
RSI6IkFETUlOIiwiaWF0IjoxNzExNDMyNzA2fQ.F--bjeSxCd5lHy2LgAtrCYLuWvz8X1NUkosDX_FDz38",
        "username": "ayush20april@gmail.com"
    }
}
```


Interview

1. Schedule Interview

POST: http://localhost:8085/api/v1/interview/create

Request Body:


```
{
    "interviewSubject" : "Java fresher developer at XYZ",
    "candidateToken": "b8a03130-af06-40f5-aee6-de2d790768b4",
    "meetLink": "meet.xyz.com/abc-123-abc",
```

```
    "interviewMode": "ONLINE",
    "dateTime": "2024-04-01T10:00:00",
    "timeZone": "Asia/Kolkata"
}
```

Response Body:

```
{
    "code": 2000,
    "message": "Success",
    "data": "eebfc80a-c145-4fc8-83d5-60c24ab547aa"
}
```

2. Interview List

GET: http://localhost:8085/api/v1/interview/all?token=b8a03130-af06-40f5-aee6-de2d790768b4

Response Body:

```
{
    "code": 2000,
    "message": "Success",
    "data": [
        {
            "interviewMode": "ONLINE",
            "interviewSubject": "Java fresher developer at XYZ",
            "interviewToken": "eebfc80a-c145-4fc8-83d5-60c24ab547aa",
            "interviewStatus": "SCHEDULED",
            "interviewTime": "2024-04-01T04:30:00Z"
        }
    ]
}
```

3. Change interview status

PATCH: http://localhost:8085/api/v1/interview/status

Request Body:

```
{
    "interviewToken": "eebfc80a-c145-4fc8-83d5-60c24ab547aa",
    "interviewStatus": "COMPLETED"
}
```

Response Body:

```
{
    "code": 2000,
    "message": "Success",
    "data": "eebfc80a-c145-4fc8-83d5-60c24ab547aa"
}
```

4. Save interview result

POST: http://localhost:8085/api/v1/interview/feedback

Request Body:

```
{
    "feedback": "Was able to answer most of the questions.",
    "decision": "Passed",
    "interviewToken": "eebfc80a-c145-4fc8-83d5-60c24ab547aa"
}
```

Response Body:

```
{
    "code": 2000,
    "message": "Success",
    "data": "eebfc80a-c145-4fc8-83d5-60c24ab547aa"
}
```

5. Get interview details

GET: http://localhost:8085/api/v1/interview/details?interviewToken=eebfc80a-c145-4fc8-83d5-60c24ab547aa&candidateToken=b8a03130-af06-40f5-aee6-de2d790768b4

Response Body:


```
{
    "code": 2000,
    "message": "Success",
    "data": {
        "interviewSubject": "Java fresher developer at XYZ",
        "meetLink": "meet.xyz.com/abc-123-abc",
        "meetTime": "2024-04-01T04:30:00Z",
        "interviewResult": {
            "interviewResultToken": "2a602413-cfc1-4ca1-8645-4ef331542a45",
            "feedback": "Was able to answer most of the questions.",
            "decision": "Passed"
        },
        "resumeDetails": {
            "documentToken": "1TdLl6LJNVP517AQlRksJN8hXHm3dp_K0",
            "documentName": "Ayush Singh Resume.pdf",
            "format": "pdf",
            "documentUrl": "https://drive.google.com/file/d/1TdLl6LJNVP517AQlRksJN8hXHm3dp_K0"
        },
        "interviewMode": "ONLINE",
        "interviewStatus": "COMPLETED",
        "interviewToken": "eebfc80a-c145-4fc8-83d5-60c24ab547aa"
    }
}
```


Source Code Repository

The complete code for this project can be found here-

https://github.com/singhayush20/Assignments/tree/main/Spring%20Boot/Wk05_06