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Факультет «Информатика и системы управления»

Кафедра ИУ5 «Системы обработки информации и управления»

Курс «Парадигмы и конструкции языков программирования»

Отчет по ДЗ

Вариант 21

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Описание задания

Мессенджен на голанге, для взаимодействия используется вебсокет.

Текст программы

"C:\Go-Projects\Small-Messenger\cmd\client\main.go":

```
"package main


import (
	"messenger/internal/iface"
	"os"


	"github.com/rs/zerolog"
	"github.com/rs/zerolog/log"
)


func main() {
	im := iface.NewInterfaceManager()


	log.Info().Msg("client is running")
	im.RunApp()
}


func init() {
	log.Logger = log.Output(zerolog.ConsoleWriter{Out: os.Stderr})
}
"
```

"C:\Go-Projects\Small-Messenger\cmd\client\token.env":

```
"REGISTRATION_TOKEN=
"
```

"C:\Go-Projects\Small-Messenger\cmd\server\config.env":

"DB_USER = postgres

DB_PASSWORD = mypass

DB_NAME = messenger

DB_SSL_MODE = disable

DB_DRIVER = postgres

PORT = 80"

"C:\Go-Projects\Small-Messenger\cmd\server\main.go":

"package main

```
import (
	"fmt"
	"messenger/config"
	controller "messenger/internal/controller/server"
	"messenger/internal/middleware"
	"messenger/internal/repository"
	"messenger/internal/service/service"
	"os"
	"os/signal"
	"syscall"

	"github.com/gin-gonic/gin"
	"github.com/pkg/errors"
	"github.com/rs/zerolog"
	"github.com/rs/zerolog/log"
	"github.com/rs/zerolog/pkgerrors"
)
```

```
func main() {
	router := gin.Default()

	cfg := config.New()

	db := config.NewDB(cfg)

	repo := repository.New(db)

	cs := service.New(repo)

	cr := controller.New(repo, cs)

	router.POST("/register", cr.Register)
	router.POST("/login", cr.Login)

	auth := router.Group("/")
	auth.Use(middleware.Authentication())

	auth.GET("/chats", cr.GetChats)
	auth.GET("/chats/:id/history", cr.GetLastChatMessages)
	auth.GET("/token", cr.ValidateTokenHandler)

	auth.GET("/ws/chats", cr.NewChat)
	auth.GET("/ws/chats/:id", cr.JoinChat)

	errs := make(chan error)
	go func() {
```

```
		err := router.Run(fmt.Sprintf(":%s", cfg.PORT))
		errs <- errors.Wrap(err, "running server")
	}()

	go func() {
		c := make(chan os.Signal, 1)
		signal.Notify(c, syscall.SIGINT, syscall.SIGTERM)
		buf := <-c
		errs <- errors.New(buf.String())
	}()

	log.Fatal().Err(<-errs).Msg("")
}

func init() {
	log.Logger = log.Output(zerolog.ConsoleWriter{Out: os.Stderr})
	zerolog.ErrorStackMarshaler = pkgerrors.MarshalStack
}
"

"C:\Go-Projects\Small-Messenger\config\config.go":
"package config

import (
	"github.com/rs/zerolog/log"
	"github.com/spf13/viper"
)

type Config struct {
```

```
	DB_USER     string
	DB_PASSWORD string
	DB_NAME     string
	DB_SSL_MODE string
	DB_DRIVER   string
	PORT        string
}

func New() *Config {
	viper.SetConfigFile("config.env")

	err := viper.ReadInConfig()
	if err != nil {
		log.Fatal().Err(err).Msg("cant load cfg")
	}

	return &Config{
		viper.GetString("DB_USER"),
		viper.GetString("DB_PASSWORD"),
		viper.GetString("DB_NAME"),
		viper.GetString("DB_SSL_MODE"),
		viper.GetString("DB_DRIVER"),
		viper.GetString("PORT"),
	}
}
"

"C:\Go-Projects\Small-Messenger\config\db.go":
"package config
```

```
import (

	"fmt"



	"github.com/rs/zerolog/log"



	"github.com/jmoiron/sqlx"



	_ "github.com/lib/pq"

)



func NewDB(cfg *Config) *sqlx.DB {

	connStr := fmt.Sprintf("user=%s password=%s dbname=%s sslmode=%s",
cfg.DB_USER, cfg.DB_PASSWORD, cfg.DB_NAME, cfg.DB_SSL_MODE)

	db, err := sqlx.Open(cfg.DB_DRIVER, connStr)

	if err != nil {

		log.Fatal().Err(err).Msg("cant connect db")

	}



	if err := db.Ping(); err != nil {

		log.Fatal().Err(err).Msg("cant ping db")



	}



	return db

}

"



"C:\Go-Projects\Small-Messenger\internal\authentication\auth.go":
```

```
"package authentication

import (
	"time"

	"github.com/dgrijalva/jwt-go"
	"github.com/pkg/errors"
)

var (
	secretKey  = []byte("super-secret-key")
	sighError  = errors.New("unknown sigh method")
	tokenError = errors.New("invalid token")
)

type Claims struct {
	Id int
	jwt.StandardClaims
}

func CreateToken(Id int) (string, error) {
	claims := &Claims{
		Id: Id,
		StandardClaims: jwt.StandardClaims{
			ExpiresAt: time.Now().Add(time.Hour * 72).Unix(),
		},
	}

	token := jwt.NewWithClaims(jwt.SigningMethodHS256, claims)
```

```
	t, err := token.SignedString(secretKey)

	return t, errors.Wrap(err, "signing token")
}

func ValidateToken(token string) (*Claims, error) {
	claims := &Claims{}
	parsedToken, err := jwt.ParseWithClaims(token, claims, func(t
*jwt.Token) (interface{}, error) {
		if _, ok := t.Method.(*jwt.SigningMethodHMAC); !ok {
			return nil, errors.Wrap(sighError, "signing method")
		}

		return secretKey, nil
	})

	if err != nil {
		return nil, err
	}

	if !parsedToken.Valid {
		return nil, errors.Wrap(tokenError, "validating token")
	}

	return claims, nil
}
"
```

"C:\Go-Projects\Small-Messenger\internal\controller\client\chat.go":

"package controller

import (

	"fmt"

	"messenger/internal/models"

	"messenger/internal/utils"

	"net/http"

	"github.com/rs/zerolog/log"

)

func (hm *HandlersManager) GetChatsHandler() map[string]string {

	resp := make(map[string]string)

	response, err := hm.client.R().

		SetHeader("Authorization", utils.GetToken()).

		SetResult(&resp).

		Get(fmt.Sprintf("https://%s/chats", hm.addr))

	if err != nil {

		log.Error().Err(err).Msg("cant request getting chats")

		return nil

	}

	if response.StatusCode() != http.StatusOK {

		log.Error().Msg(string(response.Body()))

	}

```
	return resp

}


func (hm *HandlersManager) ChatHistoryHandler(chatId string)
[]models.ShortMessage {

	var resp []models.ShortMessage


	response, err := hm.client.R().

		SetHeader("Authorization", utils.GetToken()).

		SetResult(&resp).

		Get(fmt.Sprintf("https://%s/chats/%s/history", hm.addr, chatId))


	if err != nil {

		log.Error().Err(err).Msg("cant request getting chats")

		return nil

	}


	if response.StatusCode() != http.StatusOK {

		log.Error().Msg(string(response.Body()))

	}


	return resp

}

"


"C:\Go-Projects\Small-Messenger\internal\controller\client\manager.go":

"package controller


import (
```

```
	"sync"


	"github.com/go-resty/resty/v2"
)


var (
	hm   *HandlersManager
	once sync.Once
)


type HandlersManager struct {
	client *resty.Client
	addr   string
}


func GetHandlersManager() *HandlersManager {
	once.Do(func() {
		client := resty.New()
		hm = &HandlersManager{client: client, addr: "genuine-fish-
light.ngrok-free.app"}
	})


	return hm
}
"


"C:\Go-Projects\Small-Messenger\internal\controller\client\user.go":
"package controller
```

```
import (
	"fmt"
	"messenger/internal/utils"
	"net/http"

	"github.com/rs/zerolog/log"
)

func (hm *HandlersManager) RegistrationHandler(username, password string) {
	type Response struct {
		Token string `json:"token"`
	}

	var resp Response
	response, err := hm.client.R().
		SetHeader("Content-Type", "application/json").
		SetBody(map[string]interface{}{
			"username": username,
			"password": password,
		}).
		SetResult(&resp).
		Post(fmt.Sprintf("https://%s/register", hm.addr))

	if err != nil {
		log.Error().Err(err).Msg("cant request registration")
		return
	}

	if response.StatusCode() != http.StatusOK {
```

```
		log.Error().Msg(string(response.Body()))
		return
	}

	utils.WriteToken(resp.Token)
}

func (hm *HandlersManager) LoginHandler(username, password string) {
	type Response struct {
		Token string `json:"token"`
	}

	var resp Response
	response, err := hm.client.R().
		SetHeader("Content-Type", "application/json").
		SetBody(map[string]interface{}{
			"username": username,
			"password": password,
		}).
		SetResult(&resp).
		Post(fmt.Sprintf("https://%s/login", hm.addr))

	if err != nil {
		log.Error().Err(err).Msg("cant request login")
		return
	}

	if response.StatusCode() != http.StatusOK {
		log.Error().Msg(string(response.Body()))
```

```
            return
      }

      utils.WriteToken(resp.Token)
}

func (hm *HandlersManager) ValidateTokenHandler() bool {
      token := utils.GetToken()

      response, err := hm.client.R().
            SetHeader("Authorization", token).
            Get(fmt.Sprintf("https://%s/token", hm.addr))

      if err != nil {
            log.Error().Err(err).Msg("cant request token validation")
            return false
      }
      return response.StatusCode() == http.StatusOK
}
"

"C:\Go-Projects\Small-Messenger\internal\controller\client\websocket.go":
"package controller

import (
      "context"
      "fmt"
      chatSvc "messenger/internal/service/client"
      "messenger/internal/utils"
```

```
	"sync"

	"github.com/gobwas/ws"
	"github.com/rs/zerolog/log"
)

func (hm *HandlersManager) NewChatHandler(recipient string) {
	conn, _, _, err := ws.Dialer{
		Header: ws.HandshakeHeaderHTTP{
			"Authorization": []string{utils.GetToken()},
			"Recipient":     []string{recipient},
		},
	}.Dial(context.TODO(), fmt.Sprintf("wss://%s/ws/chats", hm.addr))

	if err != nil {
		log.Error().Err(err).Msg("cant request create new chat")
		return
	}

	var wg sync.WaitGroup
	wg.Add(2)
	go chatSvc.Reader(&wg, conn)
	go chatSvc.Writer(&wg, conn)
	wg.Wait()
}

func (hm *HandlersManager) JoinChatHandler(chatId string) {
	conn, _, _, err := ws.Dialer{
		Header: ws.HandshakeHeaderHTTP{
```

```
                  "Authorization": []string{utils.GetToken()},

            },

      }.Dial(context.TODO(), fmt.Sprintf("wss://%s/ws/chats/%s", hm.addr,
chatId))



      if err != nil {

            log.Error().Err(err).Msg("cant request join chat")

            return

      }



      var wg sync.WaitGroup

      wg.Add(2)

      go chatSvc.Reader(&wg, conn)

      go chatSvc.Writer(&wg, conn)

      wg.Wait()

}

"



"C:\Go-Projects\Small-Messenger\internal\controller\server\chat.go":

"package handlers



import (

      "fmt"

      "messenger/internal/models"

      "net/http"

      "strconv"



      "github.com/gin-gonic/gin"

      "github.com/pkg/errors"
```

```
	"github.com/rs/zerolog/log"

)

func (cr *Controller) GetChats(c *gin.Context) {

	id := c.GetInt("id")

	chats, err := cr.repo.GetAllUserChats(id)

	if err != nil {

		log.Error().Stack().Err(errors.Wrap(err, "calling
GetAllUserChats")).Msg("")

		c.String(http.StatusInternalServerError, err.Error())

		return

	}

	c.JSON(http.StatusOK, chats)

}

func (cr *Controller) GetLastChatMessages(c *gin.Context) {

	chatId, err := strconv.Atoi(c.Params.ByName("id"))

	if err != nil {

		log.Error().Stack().Err(errors.Wrap(err, "parsing string to
int")).Msg("")

		c.String(http.StatusBadRequest, err.Error())

		return

	}

	messages, err := cr.repo.GetLastChatMessages(chatId)

	if err != nil {

		log.Error().Stack().Err(errors.Wrap(err, "calling
GetLastChatMessages")).Msg("")
```

```
            c.String(http.StatusInternalServerError, err.Error())

            return

      }


      c.JSON(http.StatusOK, messages)

}


func (cr *Controller) NewChat(c *gin.Context) {

      cr.cs.Upgrade(c)


      senderId := c.GetInt("id")


      sender, err := cr.repo.GetUserById(senderId)

      if err != nil {

            log.Error().Stack().Err(errors.Wrap(err, "calling
GetUserById")).Msg("")

            return

      }


      recipientUsername := c.GetHeader("Recipient")


      recipient, err := cr.repo.GetUserByName(recipientUsername)

      if err != nil {

            log.Error().Stack().Err(errors.Wrap(err, "calling
GetUserByName")).Msg("")

            return

      }


      chatId, err := cr.repo.CreateChat(models.Chat{
```

```
            Name: fmt.Sprintf("%s and %s", sender.Username,
recipient.Username),

      })

      if err != nil {

            log.Error().Stack().Err(errors.Wrap(err, "calling
CreateChat")).Msg("")

            return

      }



      err = cr.repo.AddChatMember(models.ChatMember{

            ChatId: chatId,

            UserId: sender.Id,

      })

      if err != nil {

            log.Error().Stack().Err(errors.Wrap(err, "calling
AddChatMember")).Msg("")

            return

      }



      err = cr.repo.AddChatMember(models.ChatMember{

            ChatId: chatId,

            UserId: recipient.Id,

      })

      if err != nil {

            log.Error().Stack().Err(errors.Wrap(err, "calling
AddChatMember")).Msg("")

            return

      }



      cr.cs.JoinChat(senderId, chatId)

}
```

```
func (cr *Controller) JoinChat(c *gin.Context) {

	err := cr.cs.Upgrade(c)

	if err != nil {

		c.String(http.StatusInternalServerError, err.Error())

		log.Error().Stack().Err(errors.Wrap(err, "upgrading to
websocket")).Msg("")

		return

	}



	chatId, err := strconv.Atoi(c.Params.ByName("id"))

	if err != nil {

		log.Error().Stack().Err(errors.Wrap(err, "parsing string to
int")).Msg("")

		return

	}



	senderId := c.GetInt("id")



	cr.cs.JoinChat(senderId, chatId)

}

"



"C:\Go-Projects\Small-Messenger\internal\controller\server\controller.go":

"package handlers



import (

	"messenger/internal/interfaces"

	"messenger/internal/service/service"

)
```

```
type Controller struct {
	repo interfaces.Repository
	cs   *service.ChatService
}

func New(repo interfaces.Repository, cs *service.ChatService) *Controller {
	return &Controller{repo: repo, cs: cs}
}
"

"C:\Go-Projects\Small-Messenger\internal\controller\server\user.go":
"package handlers

import (
	"messenger/internal/authentication"
	"messenger/internal/models"
	"net/http"

	"github.com/gin-gonic/gin"
	"github.com/pkg/errors"
	"github.com/rs/zerolog/log"
	"golang.org/x/crypto/bcrypt"
)

func (cr *Controller) Register(c *gin.Context) {
	user := models.User{}
	err := c.ShouldBindJSON(&user)
	if err != nil {
```

```
            log.Error().Stack().Err(errors.Wrap(err, "binding json")).Msg("")

            c.String(http.StatusBadRequest, err.Error())

            return

      }



      securedPass, err := bcrypt.GenerateFromPassword([]byte(user.Password),
bcrypt.DefaultCost)

      if err != nil {

            log.Error().Stack().Err(errors.Wrap(err, "generating hashed
password")).Msg("")

            c.String(http.StatusInternalServerError, err.Error())

            return

      }



      user.Password = string(securedPass)



      userId, err := cr.repo.CreateUser(user)

      if err != nil {

            log.Error().Stack().Err(errors.Wrap(err, "calling
CreateUser")).Msg("")

            c.String(http.StatusInternalServerError, err.Error())

            return

      }



      token, err := authentication.CreateToken(userId)

      if err != nil {

            log.Error().Stack().Err(errors.Wrap(err, "calling
CreateToken")).Msg("")

            c.String(http.StatusInternalServerError, err.Error())

            return

      }
```

```
	c.JSON(http.StatusOK, gin.H{"token": token})

}


func (cr *Controller) Login(c *gin.Context) {

	user := models.User{}

	c.ShouldBindJSON(&user)



	scannedUser, err := cr.repo.GetUserByName(user.Username)

	if err != nil {

		log.Error().Stack().Err(errors.Wrap(err, "calling
GetUserByName")).Msg("")

		c.String(http.StatusInternalServerError, err.Error())

		return

	}



	err = bcrypt.CompareHashAndPassword([]byte(scannedUser.Password),
[]byte(user.Password))

	if err != nil {

		log.Error().Stack().Err(errors.Wrap(err, "comparing password to
hashed password")).Msg("")

		c.String(http.StatusForbidden, err.Error())

		return

	}



	token, err := authentication.CreateToken(scannedUser.Id)

	if err != nil {

		log.Error().Stack().Err(errors.Wrap(err, "calling
CreateToken")).Msg("")

		c.String(http.StatusInternalServerError, err.Error())

		return
```

```
	}

	c.JSON(http.StatusOK, gin.H{"token": token})
}

func (cr *Controller) ValidateTokenHandler(c *gin.Context) {
	c.JSON(http.StatusOK, "")
}
"

"C:\Go-Projects\Small-Messenger\internal\iface\manager.go":
"package iface

import (
	controller "messenger/internal/controller/client"
)

type InterfaceManager struct {
	hm *controller.HandlersManager
}

func NewInterfaceManager() *InterfaceManager {
	return &InterfaceManager{hm: controller.GetHandlersManager()}
}

func (im *InterfaceManager) RunApp() {
	im.switchToMainMenu()
}
"
```

"C:\Go-Projects\Small-Messenger\internal\iface\switchers.go":

```
"package iface


import (
	"fmt"
	"os"


	"github.com/rs/zerolog/log"
)


func (im *InterfaceManager) switchToStartMenu() {
	str := `Register Menu
1) Register
2) Login
3) Quit`
	fmt.Println(str)


	var option int
	for {
		_, err := fmt.Scanf("%d\n", &option)
		if err != nil {
			log.Error().Err(err).Msg("incorrect input")
			continue
		}


		switch option {
		case 1:
			im.switchToRegistrationMenu()
```

```
            case 2:
                  im.switchToLoginMenu()
            case 3:
                  os.Exit(0)
            default:
                  log.Info().Msg(fmt.Sprintf("there is no option %d)",
option))
                  continue
            }
            break
      }
}

func (im *InterfaceManager) switchToRegistrationMenu() {
      fmt.Println("Please enter login and password in format login password")

      var username, password string
      for {
            _, err := fmt.Scanf("%s %s\n", &username, &password)
            if err != nil {
                  log.Error().Err(err).Msg("incorrect input please check
correct format")
                  continue
            }
            break
      }

      im.hm.RegistrationHandler(username, password)
      im.switchToMainMenu()
}
```

```
func (im *InterfaceManager) switchToLoginMenu() {
	fmt.Println("Please enter login and password in format login password")

	var username, password string
	for {
		_, err := fmt.Scanf("%s %s\n", &username, &password)
		if err != nil {
			log.Error().Err(err).Msg("incorrect input please check
correct format")
			continue
		}
		break
	}

	im.hm.LoginHandler(username, password)
	im.switchToMainMenu()
}

func (im *InterfaceManager) switchToChatsMenu() {
	str := "Chats Menu\n1) New chat\n"
	chats := im.hm.GetChatsHandler()
	options := make(map[int]string)
	var i int = 2
	for id, name := range chats {
		str += fmt.Sprintf("%d) Chat : %s\n", i, name)
		options[i] = id
		i++
	}
```

```
	str += fmt.Sprintf("%d) Quit", i)
	fmt.Println(str)

	var option int
	for {
		_, err := fmt.Scanf("%d\n", &option)
		if err != nil {
			log.Error().Err(err).Msg("incorrect input")
			continue
		}

		switch option {
		case 1:
			im.switchToChatCreationChatMenu()
		case i:
			os.Exit(0)
		default:
			if option > i-1 || option < 1 {
				log.Info().Msg(fmt.Sprintf("there is no option %d)",
option))
				continue
			}
			im.switchToJoinChatMenu(options[option])
		}
		break
	}
}

func (im *InterfaceManager) switchToChatCreationChatMenu() {
```

```
	fmt.Println("Please enter recipient's username\nTo exit write \"/back\"")

	var username string
	for {
		_, err := fmt.Scanf("%s\n", &username)
		if err != nil {
			log.Error().Err(err).Msg("incorrect input")
			continue
		}

		if username == "/back" {
			im.switchToMainMenu()
		}
		break
	}

	im.switchToNewChatMenu(username)
}

func (im *InterfaceManager) switchToNewChatMenu(username string) {
	str := fmt.Sprintf("Chat with %s", username)
	fmt.Println(str)

	im.hm.NewChatHandler(username)
}

func (im *InterfaceManager) switchToJoinChatMenu(chatId string) {
	messages := im.hm.ChatHistoryHandler(chatId)
```

```
	for i := len(messages) - 1; i >= 0; i-- {

		fmt.Printf("%s : %s\n", messages[i].SenderUsername,
messages[i].Message)

	}

	im.hm.JoinChatHandler(chatId)

}



func (im *InterfaceManager) switchToMainMenu() {

	if im.hm.ValidateTokenHandler() {

		im.switchToChatsMenu()

	} else {

		im.switchToStartMenu()

	}

}

"



"C:\Go-Projects\Small-Messenger\internal\interfaces\interfaces.go":

"package interfaces



import (

	"messenger/internal/models"

)



type Repository interface {

	CreateUser(user models.User) (int, error)

	GetUserByName(username string) (models.User, error)

	GetUserIdByName(username string) (id int, err error)

	GetUserById(id int) (models.User, error)

	GetUsernameById(id int) (string, error)
```

```
	CreateChat(chat models.Chat) (id int, err error)
	GetAllUserChats(userId int) (map[int]string, error)

	AddChatMember(cm models.ChatMember) error
	GetAllChatMembers(chatId int) ([]int, error)
	SaveMessage(msg models.Message) error
	GetLastChatMessages(chatId int) ([]models.ShortMessage, error)
}
"

"C:\Go-Projects\Small-Messenger\internal\middleware\auth.go":
"package middleware

import (
	"messenger/internal/authentication"
	"net/http"

	"github.com/gin-gonic/gin"
)

func Authentication() gin.HandlerFunc {
	return func(c *gin.Context) {
		token := c.GetHeader("Authorization")

		claims, err := authentication.ValidateToken(token)

		if err != nil {
			c.AbortWithError(http.StatusForbidden, err)
```

```
                return
            }

            c.Set("id", claims.Id)

            c.Next()
        }
}
"

"C:\Go-Projects\Small-Messenger\internal\models\db.go":
"package models

import "time"

type User struct {
        Id       int    `json:"id"`
        Username string `json:"username"`
        Password string `json:"password"`
}

type Message struct {
        Id      int
        ChatId  int
        UserId  int
        Date    time.Time
        Message string
}
```

```
type ShortMessage struct {

	SenderUsername string `json:"sender_username"`

	Message        string `json:"message"`

}


type Chat struct {

	Id   int

	Name string

}


type ChatMember struct {

	Id     int

	ChatId int

	UserId int

}

"


"C:\Go-Projects\Small-Messenger\internal\repository\chats.go":

"package repository


import "messenger/internal/models"


func (dm *repository) CreateChat(chat models.Chat) (id int, err error) {

	err = dm.db.QueryRow("insert into chats (name) values ($1) returning
id", chat.Name).Scan(&id)

	return

}


func (dm *repository) GetAllUserChats(userId int) (map[int]string, error) {
```

```
	req := `SELECT chat_members.chat_id, chats.name
	FROM chats
	JOIN chat_members ON chat_members.chat_id = chats.id
	WHERE chat_members.user_id = $1`
	rows, err := dm.db.Query(req, userId)
	if err != nil {
		return nil, err
	}

	result := make(map[int]string)
	for rows.Next() {
		var (
			id   int
			name string
		)
		err = rows.Scan(&id, &name)
		if err != nil {
			return nil, err
		}

		result[id] = name
	}

	return result, nil
}
"

"C:\Go-Projects\Small-Messenger\internal\repository\chat_members.go":
"package repository
```

```
import "messenger/internal/models"



func (dm *repository) AddChatMember(cm models.ChatMember) error {

	_, err := dm.db.Exec("insert into chat_members (chat_id,user_id) values
($1,$2)", cm.ChatId, cm.UserId)

	return err

}



func (dm *repository) GetAllChatMembers(chatId int) ([]int, error) {

	rows, err := dm.db.Query("select user_id from chat_members where chat_id
= $1", chatId)

	if err != nil {

		return nil, err

	}



	var result []int

	for rows.Next() {

		var userId int

		err := rows.Scan(&userId)

		if err != nil {

			return nil, err

		}



		result = append(result, userId)

	}



	return result, nil

}

"
```

"C:\Go-Projects\Small-Messenger\internal\repository\messages.go":

```
"package repository



import (

	"messenger/internal/models"

)



func (dm *repository) SaveMessage(msg models.Message) error {

	_, err := dm.db.Exec("insert into messages (chat_id,user_id,message)
values ($1,$2,$3)", msg.ChatId, msg.UserId, msg.Message)

	return err

}



func (dm *repository) GetLastChatMessages(chatId int) ([]models.ShortMessage,
error) {

	req := `SELECT users.username, messages.message

	FROM messages

	JOIN users ON messages.user_id = users.id

	WHERE messages.chat_id = $1

	ORDER BY messages.id DESC

	LIMIT 20`

	rows, err := dm.db.Query(req, chatId)

	if err != nil {

		return nil, err

	}



	var messages []models.ShortMessage

	for rows.Next() {

		var senderUsername, msg string
```

```
            err = rows.Scan(&senderUsername, &msg)

            if err != nil {

                  return nil, err

            }


            messages = append(messages, models.ShortMessage{SenderUsername:
senderUsername, Message: msg})

      }


      return messages, nil

}

"


"C:\Go-Projects\Small-Messenger\internal\repository\repository.go":

"package repository


import (

      "messenger/internal/interfaces"


      "github.com/jmoiron/sqlx"

      _ "github.com/lib/pq"

)


type repository struct {

      db *sqlx.DB

}


func New(db *sqlx.DB) interfaces.Repository {

      return &repository{db: db}
```

```
}

"



"C:\Go-Projects\Small-Messenger\internal\repository\users.go":

"package repository



import (

	"messenger/internal/models"



	_ "github.com/lib/pq"

	"github.com/pkg/errors"

)



func (dm *repository) CreateUser(user models.User) (int, error) {

	var id int

	err := dm.db.QueryRow("insert into users (username,password) values
($1,$2) returning id", user.Username, user.Password).Scan(&id)

	return id, errors.Wrap(err, "inserting into users")

}



func (dm *repository) GetUserByName(username string) (models.User, error) {

	scannedUser := models.User{}

	err := dm.db.QueryRow("select * from users where username = $1",
username).Scan(&scannedUser.Id, &scannedUser.Username, &scannedUser.Password)

	return scannedUser, errors.Wrap(err, "selecting from users by username")

}



func (dm *repository) GetUserIdByName(username string) (id int, err error) {

	err = dm.db.QueryRow("select id from users where username = $1",
username).Scan(&id)
```

```
	return id, errors.Wrap(err, "selecting id from users users by username")

}


func (dm *repository) GetUserById(id int) (models.User, error) {

	user := models.User{}

	err := dm.db.QueryRow("select * from users where id = $1",
id).Scan(&user.Id, &user.Username, &user.Password)

	return user, errors.Wrap(err, "selecting from users by id")

}


func (dm *repository) GetUsernameById(id int) (string, error) {

	var username string

	err := dm.db.QueryRow("select username from users where id = $1",
id).Scan(&username)

	return username, errors.Wrap(err, "selecting username from users by id")

}

"


"C:\Go-Projects\Small-Messenger\internal\service\client\chat.go":

"package websocket


import (

	"bufio"

	"fmt"

	"net"

	"os"

	"sync"


	"github.com/gobwas/ws/wsutil"

	"github.com/rs/zerolog/log"
```

```
)

func Reader(wg *sync.WaitGroup, conn net.Conn) {
	defer wg.Done()
	for {
		msg, err := wsutil.ReadServerText(conn)
		if err != nil {
			log.Error().Err(err).Msg("cant read message from conn")
			return
		}

		fmt.Println(string(msg))
	}
}

func Writer(wg *sync.WaitGroup, conn net.Conn) {
	defer wg.Done()
	r := bufio.NewReader(os.Stdin)
	for {
		r.Reset(os.Stdin)

		msg, err := r.ReadString('\n')
		if err != nil {
			log.Error().Err(err).Msg("cant read message from console")
			return
		}
		fmt.Println()

		err = wsutil.WriteClientText(conn, []byte(msg))
```

```
            if err != nil {
                  log.Error().Err(err).Msg("cant write message to conn")
                  return
            }
      }
}
"

"C:\Go-Projects\Small-Messenger\internal\service\service\chat.go":
"package service

import (
      "messenger/internal/models"

      "github.com/gobwas/ws/wsutil"
      "github.com/pkg/errors"
      "github.com/rs/zerolog/log"
)

func (cs *ChatService) JoinChat(id, chatId int) {
      cs.startReader(id, chatId)
      cs.startWriter(id)
}

func (wm *ChatService) startReader(id, chatId int) {
      go func() {
            cm := wm.getChatMember(id)
            for {
                  msg, err := wsutil.ReadClientText(cm.conn)
```

```
                  if err != nil {
                        wm.deleteChatMember(id)
                        log.Error().Stack().Err(errors.Wrap(err, "reading
client message")).Msg("")
                        return
                  }

                  wm.broadcast(id, chatId, msg)

                  errCh := make(chan error)
                  go func(errCh chan<- error) {
                        err := wm.repo.SaveMessage(models.Message{
                              ChatId:  chatId,
                              UserId:  id,
                              Message: string(msg),
                        })

                        errCh <- err
                  }(errCh)

                  err = <-errCh
                  if err != nil {
                        log.Error().Stack().Err(errors.Wrap(err, "saving
message to db")).Msg("")
                        return
                  }
            }
      }()
}
```

```
func (wm *ChatService) startWriter(id int) {

	go func() {

		cm := wm.getChatMember(id)

		// type Message struct {

		//    senderUsername string

		//    message        string

		// }

		// senderUsername, err := wm.dm.GetUsernameById(id)

		// if err != nil {

		//    log.Error().Err(err).Msg("cant get username from db")

		//    return

		// }

		for {

			// message := Message{senderUsername: senderUsername}


			msg := <-cm.out

			// message.message=string(msg)


			err := wsutil.WriteServerText(cm.conn, msg)

			if err != nil {

				wm.deleteChatMember(id)

				log.Error().Stack().Err(errors.Wrap(err, "writing
message to client")).Msg("")

				return

			}

		}

	}()

}
```

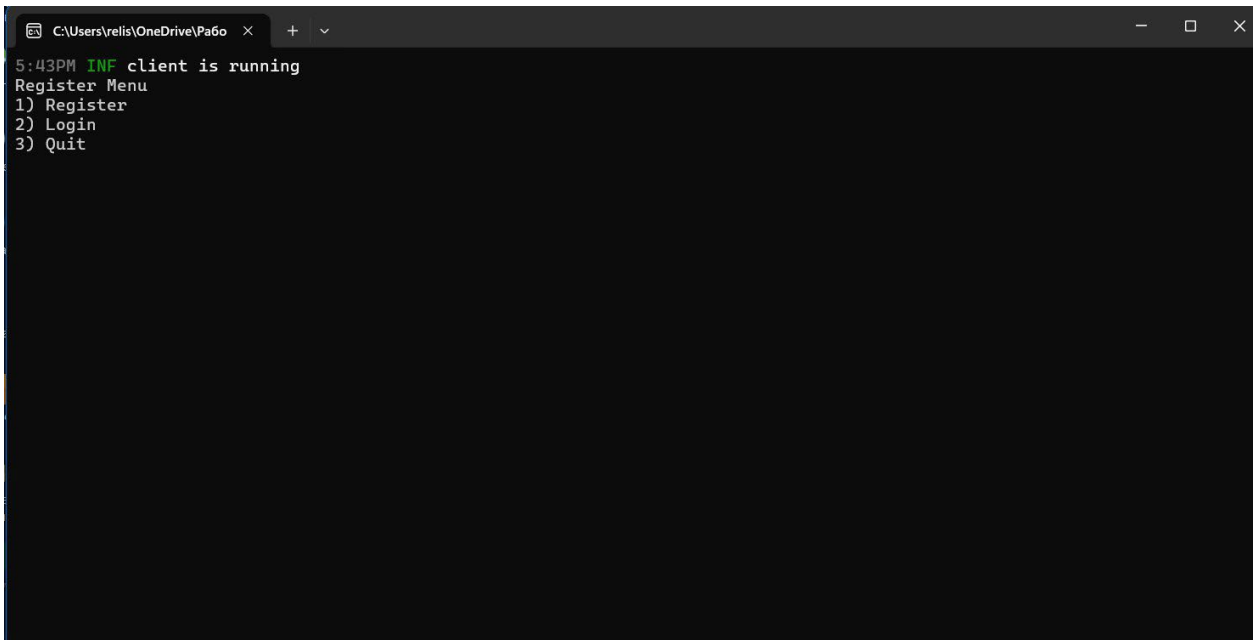
```
func (wm *ChatService) broadcast(id, chatId int, msg []byte) {

	members, err := wm.repo.GetAllChatMembers(chatId)

	if err != nil {

		log.Error().Stack().Err(errors.Wrap(err, "calling
GetAllChatMembers")).Msg("")

		return

	}

	for _, recipientId := range members {

		if recipientId != id && wm.isConnected(recipientId) {

			recipient := wm.getChatMember(recipientId)

			recipient.out <- msg

		}

	}

}

"



"C:\Go-Projects\Small-Messenger\internal\service\service\chat_service.go":

"package service



import (

	"messenger/internal/interfaces"

	"net"

	"sync"

)



type ChatService struct {

	repo        interfaces.Repository

	chatMembers map[int]*chatMember

	mu          sync.Mutex
```

```
}

type chatMember struct {
	conn net.Conn
	out  chan []byte
}

func New(repo interfaces.Repository) *ChatService {
	return &ChatService{repo: repo, chatMembers: make(map[int]*chatMember)}
}
"

"C:\Go-Projects\Small-Messenger\internal\service\service\members.go":
"package service

import "net"

func (cs *ChatService) addChatMember(id int, conn net.Conn) {
	cs.mu.Lock()
	cs.chatMembers[id] = &chatMember{conn: conn, out: make(chan []byte, 5)}
	cs.mu.Unlock()
}

func (cs *ChatService) getChatMember(id int) *chatMember {
	cs.mu.Lock()
	cm := cs.chatMembers[id]
	cs.mu.Unlock()
	return cm
}
```

```
func (cs *ChatService) deleteChatMember(id int) {
	cs.mu.Lock()
	if _, ok := cs.chatMembers[id]; ok {
		cs.chatMembers[id].conn.Close()
		close(cs.chatMembers[id].out)
		delete(cs.chatMembers, id)
	}
	cs.mu.Unlock()
}

func (cs *ChatService) isConnected(id int) bool {
	cs.mu.Lock()
	_, ok := cs.chatMembers[id]
	cs.mu.Unlock()
	return ok
}
"

"C:\Go-Projects\Small-Messenger\internal\service\service\websocket.go":
"package service

import (
	"github.com/gin-gonic/gin"
	"github.com/gobwas/ws"
)

func (cs *ChatService) Upgrade(c *gin.Context) error {
	conn, _, _, err := ws.UpgradeHTTP(c.Request, c.Writer)
```

```
	if err != nil {
		return err
	}

	id := c.GetInt("id")

	cs.addChatMember(id, conn)

	return nil
}
"

"C:\Go-Projects\Small-Messenger\internal\utils\token_env.go":
"package utils

import (
	"fmt"
	"os"

	"github.com/joho/godotenv"
	"github.com/rs/zerolog/log"
)

func WriteToken(token string) {
	envFile := "token.env"

	file, err := os.OpenFile(envFile, os.O_TRUNC|os.O_CREATE|os.O_WRONLY,
0644)
	if err != nil {
```

```
            log.Error().Err(err).Msg("")
            return
        }
        defer file.Close()

        envLine := fmt.Sprintf("REGISTRATION_TOKEN=%s\n", token)

        if _, err := file.WriteString(envLine); err != nil {
            log.Error().Err(err).Msg("cant write to token.env")
            return
        }
}

func GetToken() string {
        err := godotenv.Load("token.env")
        if err != nil {
            log.Error().Err(err).Msg("cant load token.env")
            return ""
        }
        return os.Getenv("REGISTRATION_TOKEN")
}
```


C:\Users\relis\OneDrive\Pa6o
5:43PM INF client is running
Register Menu
1) Register
2) Login
3) Quit