МИНИСТЕРСТВО НАУКИ И ВЫСШЕГО ОБРАЗОВАНИЯ РОССИЙСКОЙ ФЕДЕРАЦИИ

ФЕДЕРАЛЬНОЕ ГОСУДАРСТВЕННОЕ БЮДЖЕТНОЕ

ОБРАЗОВАТЕЛЬНОЕ УЧРЕЖДЕНИЕ

ВЫСШЕГО ОБРАЗОВАНИЯ

«НОВОСИБИРСКИЙ ГОСУДАРСТВЕННЫЙ ТЕХНИЧЕСКИЙ УНИВЕРСИТЕТ»

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Кафедра вычислительной техники



**Курсовая работа**

по дисциплине: «WEB - ПРОГРАММИРОВАНИЕ»

на тему: **«Модификация лабораторной работы №5 для создания объемных (круговых) диаграмм или графиков.»**

Вариант №6

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Новосибирск

2025

СОДЕРЖАНИЕ

Введение 3

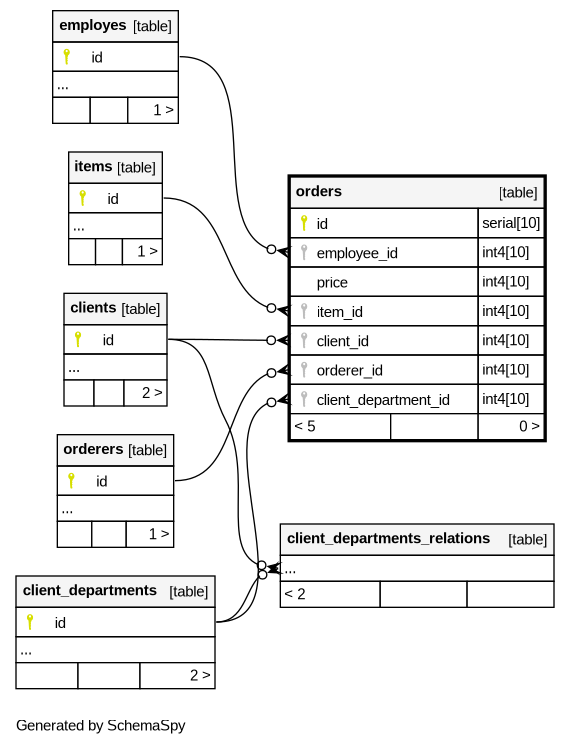
Ход работы 3

Вывод 6

# **Задание**

Модификация лабораторной работы №5 для создания объемных (круговых) диаграмм или графиков.

**Структура базы данных**



**Дамп базы данных**

--

-- PostgreSQL database dump

--

-- Dumped from database version 17.5

-- Dumped by pg\_dump version 17.5

SET statement\_timeout = 0;

SET lock\_timeout = 0;

SET idle\_in\_transaction\_session\_timeout = 0;

SET transaction\_timeout = 0;

SET client\_encoding = 'UTF8';

SET standard\_conforming\_strings = on;

SELECT pg\_catalog.set\_config('search\_path', '', false);

SET check\_function\_bodies = false;

SET xmloption = content;

SET client\_min\_messages = warning;

SET row\_security = off;

--

-- Name: user\_role; Type: TYPE; Schema: public; Owner: postgres

--

CREATE TYPE public.user\_role AS ENUM (

'user',

'admin'

);

ALTER TYPE public.user\_role OWNER TO postgres;

SET default\_tablespace = '';

SET default\_table\_access\_method = heap;

--

-- Name: client\_departments; Type: TABLE; Schema: public; Owner: postgres

--

CREATE TABLE public.client\_departments (

id integer NOT NULL,

name character varying(64) NOT NULL

);

ALTER TABLE public.client\_departments OWNER TO postgres;

--

-- Name: client\_departments\_id\_seq; Type: SEQUENCE; Schema: public; Owner: postgres

--

CREATE SEQUENCE public.client\_departments\_id\_seq

AS integer

START WITH 1

INCREMENT BY 1

NO MINVALUE

NO MAXVALUE

CACHE 1;

ALTER SEQUENCE public.client\_departments\_id\_seq OWNER TO postgres;

--

-- Name: client\_departments\_id\_seq; Type: SEQUENCE OWNED BY; Schema: public; Owner: postgres

--

ALTER SEQUENCE public.client\_departments\_id\_seq OWNED BY public.client\_departments.id;

--

-- Name: client\_departments\_relations; Type: TABLE; Schema: public; Owner: postgres

--

CREATE TABLE public.client\_departments\_relations (

client\_id integer NOT NULL,

department\_id integer NOT NULL

);

ALTER TABLE public.client\_departments\_relations OWNER TO postgres;

--

-- Name: clients; Type: TABLE; Schema: public; Owner: postgres

--

CREATE TABLE public.clients (

id integer NOT NULL,

name character varying(64) NOT NULL

);

ALTER TABLE public.clients OWNER TO postgres;

--

-- Name: clients\_id\_seq; Type: SEQUENCE; Schema: public; Owner: postgres

--

CREATE SEQUENCE public.clients\_id\_seq

AS integer

START WITH 1

INCREMENT BY 1

NO MINVALUE

NO MAXVALUE

CACHE 1;

ALTER SEQUENCE public.clients\_id\_seq OWNER TO postgres;

--

-- Name: clients\_id\_seq; Type: SEQUENCE OWNED BY; Schema: public; Owner: postgres

--

ALTER SEQUENCE public.clients\_id\_seq OWNED BY public.clients.id;

--

-- Name: employes; Type: TABLE; Schema: public; Owner: postgres

--

CREATE TABLE public.employes (

id integer NOT NULL,

name character varying(64) NOT NULL

);

ALTER TABLE public.employes OWNER TO postgres;

--

-- Name: employes\_id\_seq; Type: SEQUENCE; Schema: public; Owner: postgres

--

CREATE SEQUENCE public.employes\_id\_seq

AS integer

START WITH 1

INCREMENT BY 1

NO MINVALUE

NO MAXVALUE

CACHE 1;

ALTER SEQUENCE public.employes\_id\_seq OWNER TO postgres;

--

-- Name: employes\_id\_seq; Type: SEQUENCE OWNED BY; Schema: public; Owner: postgres

--

ALTER SEQUENCE public.employes\_id\_seq OWNED BY public.employes.id;

--

-- Name: items; Type: TABLE; Schema: public; Owner: postgres

--

CREATE TABLE public.items (

id integer NOT NULL,

name character varying(64) NOT NULL

);

ALTER TABLE public.items OWNER TO postgres;

--

-- Name: items\_id\_seq; Type: SEQUENCE; Schema: public; Owner: postgres

--

CREATE SEQUENCE public.items\_id\_seq

AS integer

START WITH 1

INCREMENT BY 1

NO MINVALUE

NO MAXVALUE

CACHE 1;

ALTER SEQUENCE public.items\_id\_seq OWNER TO postgres;

--

-- Name: items\_id\_seq; Type: SEQUENCE OWNED BY; Schema: public; Owner: postgres

--

ALTER SEQUENCE public.items\_id\_seq OWNED BY public.items.id;

--

-- Name: orderers; Type: TABLE; Schema: public; Owner: postgres

--

CREATE TABLE public.orderers (

id integer NOT NULL,

name character varying(64) NOT NULL

);

ALTER TABLE public.orderers OWNER TO postgres;

--

-- Name: orderers\_id\_seq; Type: SEQUENCE; Schema: public; Owner: postgres

--

CREATE SEQUENCE public.orderers\_id\_seq

AS integer

START WITH 1

INCREMENT BY 1

NO MINVALUE

NO MAXVALUE

CACHE 1;

ALTER SEQUENCE public.orderers\_id\_seq OWNER TO postgres;

--

-- Name: orderers\_id\_seq; Type: SEQUENCE OWNED BY; Schema: public; Owner: postgres

--

ALTER SEQUENCE public.orderers\_id\_seq OWNED BY public.orderers.id;

--

-- Name: orders; Type: TABLE; Schema: public; Owner: postgres

--

CREATE TABLE public.orders (

id integer NOT NULL,

employee\_id integer,

price integer,

item\_id integer,

client\_id integer,

orderer\_id integer,

client\_department\_id integer,

CONSTRAINT orders\_price\_check CHECK ((price >= 0))

);

ALTER TABLE public.orders OWNER TO postgres;

--

-- Name: orders\_id\_seq; Type: SEQUENCE; Schema: public; Owner: postgres

--

CREATE SEQUENCE public.orders\_id\_seq

AS integer

START WITH 1

INCREMENT BY 1

NO MINVALUE

NO MAXVALUE

CACHE 1;

ALTER SEQUENCE public.orders\_id\_seq OWNER TO postgres;

--

-- Name: orders\_id\_seq; Type: SEQUENCE OWNED BY; Schema: public; Owner: postgres

--

ALTER SEQUENCE public.orders\_id\_seq OWNED BY public.orders.id;

--

-- Name: users; Type: TABLE; Schema: public; Owner: postgres

--

CREATE TABLE public.users (

id integer NOT NULL,

username character varying(64) NOT NULL,

password character varying(64) NOT NULL,

role public.user\_role

);

ALTER TABLE public.users OWNER TO postgres;

--

-- Name: users\_id\_seq; Type: SEQUENCE; Schema: public; Owner: postgres

--

CREATE SEQUENCE public.users\_id\_seq

AS integer

START WITH 1

INCREMENT BY 1

NO MINVALUE

NO MAXVALUE

CACHE 1;

ALTER SEQUENCE public.users\_id\_seq OWNER TO postgres;

--

-- Name: users\_id\_seq; Type: SEQUENCE OWNED BY; Schema: public; Owner: postgres

--

ALTER SEQUENCE public.users\_id\_seq OWNED BY public.users.id;

--

-- Name: client\_departments id; Type: DEFAULT; Schema: public; Owner: postgres

--

ALTER TABLE ONLY public.client\_departments ALTER COLUMN id SET DEFAULT nextval('public.client\_departments\_id\_seq'::regclass);

--

-- Name: clients id; Type: DEFAULT; Schema: public; Owner: postgres

--

ALTER TABLE ONLY public.clients ALTER COLUMN id SET DEFAULT nextval('public.clients\_id\_seq'::regclass);

--

-- Name: employes id; Type: DEFAULT; Schema: public; Owner: postgres

--

ALTER TABLE ONLY public.employes ALTER COLUMN id SET DEFAULT nextval('public.employes\_id\_seq'::regclass);

--

-- Name: items id; Type: DEFAULT; Schema: public; Owner: postgres

--

ALTER TABLE ONLY public.items ALTER COLUMN id SET DEFAULT nextval('public.items\_id\_seq'::regclass);

--

-- Name: orderers id; Type: DEFAULT; Schema: public; Owner: postgres

--

ALTER TABLE ONLY public.orderers ALTER COLUMN id SET DEFAULT nextval('public.orderers\_id\_seq'::regclass);

--

-- Name: orders id; Type: DEFAULT; Schema: public; Owner: postgres

--

ALTER TABLE ONLY public.orders ALTER COLUMN id SET DEFAULT nextval('public.orders\_id\_seq'::regclass);

--

-- Name: users id; Type: DEFAULT; Schema: public; Owner: postgres

--

ALTER TABLE ONLY public.users ALTER COLUMN id SET DEFAULT nextval('public.users\_id\_seq'::regclass);

--

-- Data for Name: client\_departments; Type: TABLE DATA; Schema: public; Owner: postgres

--

COPY public.client\_departments (id, name) FROM stdin;

1 Department 1

2 Department 2

3 Better department 1

4 Better department 2

\.

--

-- Data for Name: client\_departments\_relations; Type: TABLE DATA; Schema: public; Owner: postgres

--

COPY public.client\_departments\_relations (client\_id, department\_id) FROM stdin;

1 1

1 2

2 3

2 4

\.

--

-- Data for Name: clients; Type: TABLE DATA; Schema: public; Owner: postgres

--

COPY public.clients (id, name) FROM stdin;

1 One-day firm

2 Better future inc.

\.

--

-- Data for Name: employes; Type: TABLE DATA; Schema: public; Owner: postgres

--

COPY public.employes (id, name) FROM stdin;

1 Employe 1

2 Employe 2

3 Best employe

\.

--

-- Data for Name: items; Type: TABLE DATA; Schema: public; Owner: postgres

--

COPY public.items (id, name) FROM stdin;

1 Good stuff

2 Nice stuff

\.

--

-- Data for Name: orderers; Type: TABLE DATA; Schema: public; Owner: postgres

--

COPY public.orderers (id, name) FROM stdin;

1 James Wilson

3 Liza Cuddy

2 House M.D.

\.

--

-- Data for Name: orders; Type: TABLE DATA; Schema: public; Owner: postgres

--

COPY public.orders (id, employee\_id, price, item\_id, client\_id, orderer\_id, client\_department\_id) FROM stdin;

2 1 123 1 1 1 1

3 1 456 1 2 1 3

\.

--

-- Data for Name: users; Type: TABLE DATA; Schema: public; Owner: postgres

--

COPY public.users (id, username, password, role) FROM stdin;

1 Student password user

2 admin admin admin

\.

--

-- Name: client\_departments\_id\_seq; Type: SEQUENCE SET; Schema: public; Owner: postgres

--

SELECT pg\_catalog.setval('public.client\_departments\_id\_seq', 4, true);

--

-- Name: clients\_id\_seq; Type: SEQUENCE SET; Schema: public; Owner: postgres

--

SELECT pg\_catalog.setval('public.clients\_id\_seq', 2, true);

--

-- Name: employes\_id\_seq; Type: SEQUENCE SET; Schema: public; Owner: postgres

--

SELECT pg\_catalog.setval('public.employes\_id\_seq', 3, true);

--

-- Name: items\_id\_seq; Type: SEQUENCE SET; Schema: public; Owner: postgres

--

SELECT pg\_catalog.setval('public.items\_id\_seq', 3, true);

--

-- Name: orderers\_id\_seq; Type: SEQUENCE SET; Schema: public; Owner: postgres

--

SELECT pg\_catalog.setval('public.orderers\_id\_seq', 3, true);

--

-- Name: orders\_id\_seq; Type: SEQUENCE SET; Schema: public; Owner: postgres

--

SELECT pg\_catalog.setval('public.orders\_id\_seq', 3, true);

--

-- Name: users\_id\_seq; Type: SEQUENCE SET; Schema: public; Owner: postgres

--

SELECT pg\_catalog.setval('public.users\_id\_seq', 2, true);

--

-- Name: client\_departments client\_departments\_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres

--

ALTER TABLE ONLY public.client\_departments

ADD CONSTRAINT client\_departments\_pkey PRIMARY KEY (id);

--

-- Name: client\_departments\_relations client\_departments\_relations\_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres

--

ALTER TABLE ONLY public.client\_departments\_relations

ADD CONSTRAINT client\_departments\_relations\_pkey PRIMARY KEY (client\_id, department\_id);

--

-- Name: clients clients\_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres

--

ALTER TABLE ONLY public.clients

ADD CONSTRAINT clients\_pkey PRIMARY KEY (id);

--

-- Name: employes employes\_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres

--

ALTER TABLE ONLY public.employes

ADD CONSTRAINT employes\_pkey PRIMARY KEY (id);

--

-- Name: items items\_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres

--

ALTER TABLE ONLY public.items

ADD CONSTRAINT items\_pkey PRIMARY KEY (id);

--

-- Name: orderers orderers\_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres

--

ALTER TABLE ONLY public.orderers

ADD CONSTRAINT orderers\_pkey PRIMARY KEY (id);

--

-- Name: orders orders\_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres

--

ALTER TABLE ONLY public.orders

ADD CONSTRAINT orders\_pkey PRIMARY KEY (id);

--

-- Name: users users\_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres

--

ALTER TABLE ONLY public.users

ADD CONSTRAINT users\_pkey PRIMARY KEY (id);

--

-- Name: client\_departments\_relations client\_departments\_relations\_client\_id\_fkey; Type: FK CONSTRAINT; Schema: public; Owner: postgres

--

ALTER TABLE ONLY public.client\_departments\_relations

ADD CONSTRAINT client\_departments\_relations\_client\_id\_fkey FOREIGN KEY (client\_id) REFERENCES public.clients(id);

--

-- Name: client\_departments\_relations client\_departments\_relations\_department\_id\_fkey; Type: FK CONSTRAINT; Schema: public; Owner: postgres

--

ALTER TABLE ONLY public.client\_departments\_relations

ADD CONSTRAINT client\_departments\_relations\_department\_id\_fkey FOREIGN KEY (department\_id) REFERENCES public.client\_departments(id);

--

-- Name: orders orders\_client\_department\_id\_fkey; Type: FK CONSTRAINT; Schema: public; Owner: postgres

--

ALTER TABLE ONLY public.orders

ADD CONSTRAINT orders\_client\_department\_id\_fkey FOREIGN KEY (client\_department\_id) REFERENCES public.client\_departments(id) ON DELETE RESTRICT;

--

-- Name: orders orders\_client\_id\_fkey; Type: FK CONSTRAINT; Schema: public; Owner: postgres

--

ALTER TABLE ONLY public.orders

ADD CONSTRAINT orders\_client\_id\_fkey FOREIGN KEY (client\_id) REFERENCES public.clients(id) ON DELETE RESTRICT;

--

-- Name: orders orders\_employee\_id\_fkey; Type: FK CONSTRAINT; Schema: public; Owner: postgres

--

ALTER TABLE ONLY public.orders

ADD CONSTRAINT orders\_employee\_id\_fkey FOREIGN KEY (employee\_id) REFERENCES public.employes(id) ON DELETE RESTRICT;

--

-- Name: orders orders\_item\_id\_fkey; Type: FK CONSTRAINT; Schema: public; Owner: postgres

--

ALTER TABLE ONLY public.orders

ADD CONSTRAINT orders\_item\_id\_fkey FOREIGN KEY (item\_id) REFERENCES public.items(id) ON DELETE RESTRICT;

--

-- Name: orders orders\_orderer\_id\_fkey; Type: FK CONSTRAINT; Schema: public; Owner: postgres

--

ALTER TABLE ONLY public.orders

ADD CONSTRAINT orders\_orderer\_id\_fkey FOREIGN KEY (orderer\_id) REFERENCES public.orderers(id) ON DELETE RESTRICT;

--

-- PostgreSQL database dump complete

--

**Веб-сервер на GO**

File main.go:

package main

import (

"fmt"

"log"

"net/http"

"slices"

"strconv"

"strings"

)

func index\_handler(w http.ResponseWriter, r \*http.Request) {

request\_id := r.URL.Query().Get("id")

id, err := strconv.Atoi(request\_id)

if err != nil {

id = -1

}

query, orders, err := GetOrders(id)

if err != nil {

http.Error(w, "Internal DB error", http.StatusInternalServerError)

panic(err)

}

var session\_ptr \*SessionEntry

session, err := GetSession(r)

if err == nil {

session\_ptr = &session

} else {

session\_ptr = nil

}

PrintIndex(w, query, orders, session\_ptr)

}

func insert\_handler(w http.ResponseWriter, r \*http.Request) {

if !IsAuthorized(r, USER) {

http.Error(w, "Unauthorized", http.StatusUnauthorized)

return

}

if r.Method == http.MethodGet {

employes := GetIdName("employes")

items := GetIdName("items")

clients := GetIdName("clients")

orderers := GetIdName("orderers")

PrintInsert(w, employes, items, clients, orderers)

}

if r.Method == http.MethodPost {

var err error

employee, err := strconv.Atoi(r.FormValue("employee\_id"))

if err != nil {

http.Error(w, "Invalid employee id", http.StatusBadRequest)

return

}

price, err := strconv.Atoi(r.FormValue("price"))

if err != nil {

http.Error(w, "Invalid price", http.StatusBadRequest)

return

}

item, err := strconv.Atoi(r.FormValue("item\_id"))

if err != nil {

http.Error(w, "Invalid item id", http.StatusBadRequest)

return

}

client, err := strconv.Atoi(r.FormValue("client\_id"))

if err != nil {

http.Error(w, "Invalid client id", http.StatusBadRequest)

return

}

client\_department, err := strconv.Atoi(r.FormValue("client\_department\_id"))

if err != nil {

http.Error(w, "Invalid client department id", http.StatusBadRequest)

return

}

orderer, err := strconv.Atoi(r.FormValue("orderer\_id"))

if err != nil {

http.Error(w, "Invalid orderer id", http.StatusBadRequest)

return

}

err = InsertWithIds(employee, price, item, client, client\_department, orderer)

if err != nil {

http.Error(w, "Error while inserting", http.StatusBadRequest)

return

}

http.Redirect(w, r, "/index", http.StatusSeeOther)

}

}

func update\_handler(w http.ResponseWriter, r \*http.Request) {

if !IsAuthorized(r, USER) {

http.Error(w, "Unauthorized", http.StatusUnauthorized)

return

}

if r.Method == http.MethodGet {

request\_id := r.URL.Query().Get("id")

id, err := strconv.Atoi(request\_id)

if err != nil {

http.Error(w, "Id not present", http.StatusBadRequest)

return

}

to\_update, err := GetOrderRaw(id)

employes := getIdNameOrdered("employes", to\_update.EmployeeId)

items := getIdNameOrdered("items", to\_update.ItemId)

clients := getIdNameOrdered("clients", to\_update.ClientId)

orderers := getIdNameOrdered("orderers", to\_update.OrdererId)

PrintUpdate(w, id, employes, to\_update.Price, items, clients, orderers)

}

if r.Method == http.MethodPost {

var err error

id, err := strconv.Atoi(r.FormValue("id"))

if err != nil {

http.Error(w, "Invalid order id", http.StatusBadRequest)

return

}

employee, err := strconv.Atoi(r.FormValue("employee\_id"))

if err != nil {

http.Error(w, "Invalid employee id", http.StatusBadRequest)

return

}

price, err := strconv.Atoi(r.FormValue("price"))

if err != nil {

http.Error(w, "Invalid price", http.StatusBadRequest)

return

}

item, err := strconv.Atoi(r.FormValue("item\_id"))

if err != nil {

http.Error(w, "Invalid item id", http.StatusBadRequest)

return

}

client, err := strconv.Atoi(r.FormValue("client\_id"))

if err != nil {

http.Error(w, "Invalid client id", http.StatusBadRequest)

return

}

client\_department, err := strconv.Atoi(r.FormValue("client\_department\_id"))

if err != nil {

http.Error(w, "Invalid client department id", http.StatusBadRequest)

return

}

orderer, err := strconv.Atoi(r.FormValue("orderer\_id"))

if err != nil {

http.Error(w, "Invalid orderer id", http.StatusBadRequest)

return

}

err = UpdateWithIds(id, employee, price, item, client, client\_department, orderer)

if err != nil {

http.Error(w, "Error while updating", http.StatusBadRequest)

return

}

http.Redirect(w, r, "/index", http.StatusSeeOther)

}

}

func getIdNameOrdered(table string, id int) []IdName {

result := GetIdName(table)

for i, idName := range result {

if idName.Id == id {

tmp := result[i]

result = append(result[:i], result[i+1:]...)

result = slices.Insert(result, 0, tmp)

}

}

return result

}

func delete\_handler(w http.ResponseWriter, r \*http.Request) {

if !IsAuthorized(r, ADMIN) {

http.Error(w, "Unauthorized", http.StatusUnauthorized)

return

}

request\_id := r.URL.Query().Get("id")

id, err := strconv.Atoi(request\_id)

if err != nil {

http.Error(w, "Invalid id", http.StatusBadRequest)

return

}

err = Delete(id)

if err != nil {

http.Error(w, "Wrong id", http.StatusBadRequest)

return

}

http.Redirect(w, r, "/index", http.StatusSeeOther)

}

var login\_error\_str = "Invalid login"

func login\_handler(w http.ResponseWriter, r \*http.Request) {

if r.Method == http.MethodGet {

PrintLogin(w, nil)

}

if r.Method == http.MethodPost {

username := r.FormValue("username")

password := r.FormValue("password")

user, err := GetUserRecord(username)

if err == nil && strings.Compare(password, user.Password) == 0 {

err = CreateSession(w, r, user)

}

if err != nil {

PrintLogin(w, &login\_error\_str)

} else {

http.Redirect(w, r, "/index", http.StatusSeeOther)

}

}

}

func logout\_handler(w http.ResponseWriter, r \*http.Request) {

DeleteCurrentSession(w, r)

http.Redirect(w, r, "/index", http.StatusSeeOther)

}

func histogram\_handler(w http.ResponseWriter, r \*http.Request) {

query, orders, err := GetAggregatedData()

if err != nil {

http.Error(w, "Internal DB error", http.StatusInternalServerError)

panic(err)

}

PrintHistogram(w, query, orders)

}

func client\_departments\_handler(w http.ResponseWriter, r \*http.Request) {

request\_id := r.URL.Query().Get("id")

id, err := strconv.Atoi(request\_id)

if err != nil {

http.Error(w, "Invalid id", http.StatusBadRequest)

return

}

departments := GetClientDepartments(id);

PrintClientDepartments(w, departments)

}

func main() {

var err error

err = InitModel()

if err != nil {

log.Fatal(err)

return

}

defer DeinitModel()

http.HandleFunc("/index", index\_handler)

http.HandleFunc("/insert", insert\_handler)

http.HandleFunc("/update", update\_handler)

http.HandleFunc("/delete", delete\_handler)

http.HandleFunc("/login", login\_handler)

http.HandleFunc("/logout", logout\_handler)

http.HandleFunc("/histogram", histogram\_handler)

http.HandleFunc("/get\_client\_departments", client\_departments\_handler)

http.Handle("/static/", http.StripPrefix("/static/", http.FileServer(http.Dir("static"))))

fmt.Println("Start listening at http://localhost:8080/index")

log.Fatal(http.ListenAndServe(":8080", nil))

}

File model.go:

package main

import (

"database/sql"

"errors"

"fmt"

\_ "github.com/lib/pq"

"log"

"strings"

)

var db \*sql.DB

func InitModel() error {

var err error

db, err = sql.Open("postgres", "user=postgres dbname=orders sslmode=disable")

if err != nil {

log.Fatal(err)

return err

}

return nil

}

func DeinitModel() {

db.Close()

}

type Order struct {

Id int

Employee string

Price int

Item string

Client string

ClientDepartment string

Orderer string

}

type OrderRaw struct {

Id int

EmployeeId int

Price int

ItemId int

ClientId int

ClientDepartmentId int

OrdererId int

}

const sql\_select = `

SELECT orders.id,employes.name,orders.price,items.name,clients.name,client\_departments.name,orderers.name

FROM orders

LEFT JOIN employes ON employee\_id = employes.id

LEFT JOIN items ON item\_id = items.id

LEFT JOIN clients ON client\_id = clients.id

LEFT JOIN client\_departments ON client\_department\_id = client\_departments.id

LEFT JOIN orderers ON orderer\_id = orderers.id

`

func GetOrders(id int) (string, []Order, error) {

result := make([]Order, 0, 8)

cur\_select := sql\_select

if id >= 0 {

cur\_select += fmt.Sprintf("WHERE orders.id = %d", id)

} else {

cur\_select += fmt.Sprintf("ORDER BY orders.id")

}

rows, err := db.Query(cur\_select)

if err != nil {

return "", nil, err

}

defer rows.Close()

for rows.Next() {

var order Order

err := rows.Scan(&order.Id, &order.Employee, &order.Price, &order.Item, &order.Client, &order.ClientDepartment, &order.Orderer)

if err != nil {

fmt.Println(err)

continue

}

result = append(result, order)

}

return cur\_select, result, nil

}

const aggregated\_data\_query = `

SELECT clients.name, SUM(orders.price) AS sum

FROM clients

LEFT JOIN orders ON client\_id = clients.id

GROUP BY clients.name

`

type ClientAndSum struct {

Client string

Sum int

}

func GetAggregatedData() (string, []ClientAndSum, error) {

result := make([]ClientAndSum, 0, 8)

rows, err := db.Query(aggregated\_data\_query)

if err != nil {

return "", nil, err

}

defer rows.Close()

for rows.Next() {

var result\_element ClientAndSum

err := rows.Scan(&result\_element.Client, &result\_element.Sum)

if err != nil {

fmt.Println(err)

continue

}

result = append(result, result\_element)

}

return aggregated\_data\_query, result, nil

}

func GetOrderRaw(id int) (OrderRaw, error) {

var result OrderRaw

cur\_select := `

SELECT id,employee\_id,price,item\_id,client\_id,client\_department\_id,orderer\_id

FROM orders

WHERE id = %d

`

err := db.QueryRow(fmt.Sprintf(cur\_select, id)).Scan(&result.Id, &result.EmployeeId, &result.Price, &result.ItemId, &result.ClientId, &result.ClientDepartmentId, &result.OrdererId)

if err != nil {

return result, err

}

return result, nil

}

type IdName struct {

Id int

Name string

}

func GetIdName(table string) []IdName {

result := make([]IdName, 0, 8)

rows, err := db.Query(fmt.Sprintf("SELECT id,name FROM %s", table))

if err != nil {

panic(err)

}

defer rows.Close()

for rows.Next() {

var tmp IdName

err := rows.Scan(&tmp.Id, &tmp.Name)

if err != nil {

fmt.Println(err)

continue

}

result = append(result, tmp)

}

return result

}

func GetClientDepartments(client\_id int) []IdName {

result := make([]IdName, 0, 8)

rows, err := db.Query(fmt.Sprintf(`

SELECT id,name FROM client\_departments

INNER JOIN client\_departments\_relations ON department\_id = id

WHERE client\_id = %d

`, client\_id))

if err != nil {

panic(err)

}

defer rows.Close()

for rows.Next() {

var tmp IdName

err := rows.Scan(&tmp.Id, &tmp.Name)

if err != nil {

fmt.Println(err)

continue

}

result = append(result, tmp)

}

return result

}

func Delete(id int) error {

\_, err := db.Exec("DELETE FROM orders WHERE id = $1", id)

return err

}

const sql\_insert\_tmpl = `

INSERT INTO orders (employee\_id, price, item\_id, client\_id, client\_department\_id, orderer\_id) VALUES

($1, $2, $3, $4, $5, $6);

`

func InsertWithIds(employee int, price int, item int, client int, client\_department int, orderer int) error {

\_, err := db.Exec(sql\_insert\_tmpl, employee, price, item, client, client\_department, orderer)

return err

}

const sql\_update\_tmpl = `

UPDATE orders

SET employee\_id=$1, price=$2, item\_id=$3, client\_id=$4, client\_department\_id=$5, orderer\_id=$6

WHERE id = $7

`

func UpdateWithIds(id int, employee int, price int, item int, client int, client\_department int, orderer int) error {

\_, err := db.Exec(sql\_update\_tmpl, employee, price, item, client, client\_department, orderer, id)

return err

}

type UserRole int

const (

USER UserRole = 0

ADMIN UserRole = 1

)

type UserRecord struct {

Username string

Password string

Role UserRole

}

const sql\_select\_user = `

SELECT username,password,role

FROM users

WHERE username = '%s'

`

func GetUserRecord(username string) (UserRecord, error) {

var result UserRecord

var role\_str string

err := db.QueryRow(fmt.Sprintf(sql\_select\_user, username)).Scan(&result.Username, &result.Password, &role\_str)

if err != nil {

return result, err

}

if strings.Compare(role\_str, "user") == 0 {

result.Role = USER

} else if strings.Compare(role\_str, "admin") == 0 {

result.Role = ADMIN

} else {

return result, errors.New("Invalid user role in DB")

}

return result, nil

}

File sessions.go:

package main

import (

"errors"

"github.com/gorilla/sessions"

"net/http"

)

const session\_name = "session-name"

var store = sessions.NewCookieStore([]byte("secret-key"))

type SessionEntry struct {

User UserRecord

}

func GetSession(r \*http.Request) (SessionEntry, error) {

var result SessionEntry

session, \_ := store.Get(r, session\_name)

if session.IsNew {

return result, errors.New("Session doesn't exist")

}

var ok bool

result.User.Username, ok = session.Values["username"].(string)

if !ok {

return result, errors.New("Username for session not set")

}

var user\_role int

user\_role, ok = session.Values["role"].(int)

if !ok {

return result, errors.New("User role for session not set")

}

result.User.Role = UserRole(user\_role)

return result, nil

}

func IsAuthorized(r \*http.Request, role UserRole) bool {

session, err := GetSession(r)

if err != nil {

return false

}

return session.User.Role >= role

}

func CreateSession(w http.ResponseWriter, r \*http.Request, user UserRecord) error {

var user\_role int

user\_role = int(user.Role)

session := sessions.NewSession(store, session\_name)

session.Values["username"] = user.Username

session.Values["role"] = user\_role

err := session.Save(r, w)

return err

}

func DeleteCurrentSession(w http.ResponseWriter, r \*http.Request) error {

session, \_ := store.Get(r, session\_name)

if session.IsNew {

return errors.New("Session doesn't exist")

}

session.Options.MaxAge = -1

err := session.Save(r, w)

return err

}

File view.go:

package main

import (

"fmt"

"io"

"net/http"

"strings"

)

const search\_form\_html = `

<form method="GET" action="">

<p>ID:<input type="number" step="1" min="1" name="id">

<input type="SUBMIT" value="Search"></p></form>

<a href="/index">Show all</a>

<a href="/histogram">View histogram</a>

`

const table\_end = `

</tbody></table>

`

const ckeditor\_fmt=`

<link rel="stylesheet" href="./static/ckeditor5/ckeditor5.css"/>

<div class="main-container">

<div id="editor">

%s

</div>

</div>

<script type="importmap">

{

"imports": {

"ckeditor5": "./static/ckeditor5/ckeditor5.js",

"ckeditor5/": "./static/ckeditor5/"

}

}

</script>

<script type="module">

import {

ClassicEditor,

Essentials,

Paragraph,

Bold,

Italic,

Font

} from 'ckeditor5';

ClassicEditor

.create( document.querySelector( '#editor' ), {

licenseKey: 'GPL',

plugins: [ Essentials, Paragraph, Bold, Italic, Font ],

toolbar: [

'undo', 'redo', '|', 'bold', 'italic', '|',

'fontSize', 'fontFamily', 'fontColor', 'fontBackgroundColor'

],

licenseKey: 'GPL'

} )

.then( editor => {

window.editor = editor;

} )

.catch( error => {

console.error( error );

} );

</script>

`

func make\_table\_header(w io.Writer, role \*UserRole) {

fmt.Fprintf(w, "%s", `

<table border="1"><tbody>

<tr><th><b>id</b></th><th><b>employee</b></th><th><b>price</b></th><th><b>item</b></th><th><b>client</b></th><th><b>client department</b></th><th><b>orderer</b></th>`)

if role != nil {

fmt.Fprintf(w, "%s", `<th><b>Update</b></th>`)

if \*role >= ADMIN {

fmt.Fprintf(w, "%s", `<th><b>Delete</b></th>`)

}

}

fmt.Fprintf(w, "%s", `</tr>`)

}

func make\_row(w io.Writer, id int, employee string, price int, item string, client string, client\_department string, orderer string, role \*UserRole) {

fmt.Fprintf(w, `<tr><td>%d</td><td>%s</td><td>%d</td><td>%s</td><td>%s</td><td>%s</td><td>%s</td>`, id, employee, price, item, client, client\_department, orderer)

if role != nil {

fmt.Fprintf(w, `<td><a href="update?id=%d">Update</a></td>`, id)

if \*role >= ADMIN {

fmt.Fprintf(w, `<td><a href="delete?id=%d">Delete</a></td>`, id)

}

}

fmt.Fprintf(w, `</tr>`)

}

func PrintIndex(w http.ResponseWriter, query string, orders []Order, session \*SessionEntry) {

fmt.Fprintf(w, "<h1>Just a db, bro</h1><div>")

fmt.Fprintf(w, ckeditor\_fmt, query)

var role \*UserRole = nil

if session != nil {

role = &session.User.Role

}

make\_table\_header(w, role)

for \_, order := range orders {

make\_row(w, order.Id, order.Employee, order.Price, order.Item, order.Client, order.ClientDepartment, order.Orderer, role)

}

fmt.Fprintf(w, "%s", table\_end)

fmt.Fprintf(w, search\_form\_html)

fmt.Fprintf(w, `<br/>`)

if session != nil {

fmt.Fprintf(w, `<a href="/insert">Insert</a>`)

fmt.Fprintf(w, `<div>Logged as %s</div>`, session.User.Username)

fmt.Fprintf(w, `<a href="/logout">Log out</a>`)

} else {

fmt.Fprintf(w, `<a href="/login">Login</a>`)

}

fmt.Fprintf(w, "</div>")

}

func PrintInsert(w http.ResponseWriter, employes []IdName, items []IdName, clients []IdName, orderers []IdName) {

fmt.Fprintf(w, "<html><form method=\"POST\" action=\"/insert\"><p>")

fmt.Fprintf(w, "Employee<select name=\"employee\_id\">")

print\_options(w, employes)

fmt.Fprintf(w, "</select>")

fmt.Fprintf(w, "Price<input type=\"number\" step=\"1\" min=\"1\" name=\"price\"/>")

fmt.Fprintf(w, "Item<select name=\"item\_id\">")

print\_options(w, items)

fmt.Fprintf(w, "</select>")

fmt.Fprintf(w, `Client<select id="client\_id\_select" name="client\_id">`)

print\_options(w, clients)

fmt.Fprintf(w, "</select>")

fmt.Fprintf(w, `Client department<select id="client\_department\_id\_select" name="client\_department\_id"></select>`)

fmt.Fprintf(w, `

<script src="static/jquery.js"></script>

<script>

function update\_client\_domains() {

$('#client\_department\_id\_select').load('get\_client\_departments', 'id=' + $('#client\_id\_select').val());

}

$(document).ready(function() {

update\_client\_domains();

});

$('#client\_id\_select').on('change', function() {

update\_client\_domains();

});

</script>

`);

fmt.Fprintf(w, "Orderer<select name=\"orderer\_id\">")

print\_options(w, orderers)

fmt.Fprintf(w, "</select>")

fmt.Fprintf(w, "<input type=\"SUBMIT\" value=\"Add\"></p></form></html>")

}

func PrintUpdate(w http.ResponseWriter, id int, employes []IdName, price int, items []IdName, clients []IdName, orderers []IdName) {

fmt.Fprintf(w, "<html><form method=\"POST\" action=\"/update\"><p>")

fmt.Fprintf(w, "Employee<select name=\"employee\_id\">")

print\_options(w, employes)

fmt.Fprintf(w, "</select>")

fmt.Fprintf(w, "Price<input type=\"number\" step=\"1\" min=\"1\" name=\"price\" value=\"%d\"/>", price)

fmt.Fprintf(w, "Item<select name=\"item\_id\">")

print\_options(w, items)

fmt.Fprintf(w, "</select>")

fmt.Fprintf(w, `Client<select id="client\_id\_select" name="client\_id">`)

print\_options(w, clients)

fmt.Fprintf(w, "</select>")

fmt.Fprintf(w, `Client department<select id="client\_department\_id\_select" name="client\_department\_id"></select>`)

fmt.Fprintf(w, `

<script src="static/jquery.js"></script>

<script>

function update\_client\_domains() {

$('#client\_department\_id\_select').load('get\_client\_departments', 'id=' + $('#client\_id\_select').val());

}

$(document).ready(function() {

update\_client\_domains();

});

$('#client\_id\_select').on('change', function() {

update\_client\_domains();

});

</script>

`);

fmt.Fprintf(w, "Orderer<select name=\"orderer\_id\">")

print\_options(w, orderers)

fmt.Fprintf(w, "</select>")

fmt.Fprintf(w, "<input type=\"hidden\" name=\"id\" value=\"%d\"/>", id)

fmt.Fprintf(w, "<input type=\"SUBMIT\" value=\"Update\"></p></form></html>")

}

func PrintClientDepartments(w http.ResponseWriter, client\_departments []IdName) {

print\_options(w, client\_departments)

}

func PrintLogin(w http.ResponseWriter, error \*string) {

fmt.Fprintf(w, "<html><form id=\"login-form\" method=\"POST\" action=\"/login\">")

fmt.Fprintf(w, "<p>Login<input name=\"username\" minlength=\"2\" required/></p>")

fmt.Fprintf(w, "<p>Password<input name=\"password\" minlength=\"2\" required type=\"password\"/></p>")

fmt.Fprintf(w, `<div><input class="jCaptcha" type="number" placeholder="Type in result please">`)

fmt.Fprintf(w, `

<script src="static/jCaptcha.js"></script>

<script src="static/jquery.js"></script>

<script src="static/jquery.validate.js"></script>

<script>

let myCaptcha = new jCaptcha({

requiredValue: '=',

canvasStyle: {

// required properties for captcha stylings:

width: 100,

height: 15,

textBaseline: 'top',

font: '15px Arial',

textAlign: 'left',

fillStyle: '#ddd'

}

});

$("#login-form").validate({

submitHandler: function(form) {

if(myCaptcha.validate()){

form.submit();

}

}

});

</script></div>

`)

fmt.Fprintf(w, "<p><input type=\"SUBMIT\" value=\"Login\"></p></form>")

if error != nil {

fmt.Fprintf(w, "Error: %s", \*error)

}

fmt.Fprintf(w, "</html>")

}

func print\_options(w io.Writer, table []IdName) {

for \_, tmp := range table {

fmt.Fprintf(w, "<option value=\"%d\">%s</option>", tmp.Id, tmp.Name)

}

}

const histogram\_script = `

<script src="static/chart.js"></script>

<script>

const ctx = document.getElementById('histogram');

new Chart(ctx, {

type: 'doughnut',

data: {

labels: [%s],

datasets: [{

data: [%s],

borderWidth: 1

}]

},

options: {

scales: {

y: {

beginAtZero: true

}

}

}

});

</script>

`

func PrintHistogram(w http.ResponseWriter, query string, data []ClientAndSum) {

fmt.Fprintf(w, "<h1>Orders sum by clients</h1><div>")

fmt.Fprintf(w, "<pre>%s</pre>", query)

var labels strings.Builder

var values strings.Builder

for \_, element := range data {

fmt.Fprintf(&labels, "'%s',", element.Client)

fmt.Fprintf(&values, "%d,", element.Sum)

}

fmt.Fprintf(w, `<div><canvas id="histogram"/></div>`)

fmt.Fprintf(w, histogram\_script, labels.String(), values.String())

fmt.Fprintf(w, "</div>")

}