import streamlit as st

from experiment\_pages import show\_basic\_op\_amp\_simulator

# --- Main App Configuration ---

st.set\_page\_config(

page\_title="Electronics Lab Simulator",

layout="wide",

initial\_sidebar\_state="collapsed"

)

# Initialize session state for page navigation

if 'page' not in st.session\_state:

st.session\_state.page = 'home'

# --- Header Section ---

col\_text, col\_logo = st.columns([4, 1])

with col\_text:

st.title("SRM INSTITUTE OF SCIENCE AND TECHNOLOGY")

st.subheader("Department of Electronics and Communication Engineering")

with col\_logo:

st.image("image\_a2e0d8.png", width=150)

# --- Navigation functions ---

def navigate\_to(page\_name):

"""Sets the page in session state to navigate to."""

st.session\_state.page = page\_name

def show\_home\_page():

"""Displays the main page with clickable experiment cards."""

st.title("Welcome to the Electronics Lab Simulator!")

st.write("Click on an experiment to start the simulation.")

experiments = {

"Basic Op-Amp Simulator": "A basic simulation for common op-amp configurations.",

"Integrator/Differentiator": "Simulate the behavior of op-amp based integrator and differentiator circuits with various input waveforms.",

"Precision Rectifier": "Explore half-wave and full-wave precision rectifier circuits.",

"Schmitt Trigger": "Simulate the hysteresis behavior of a Schmitt Trigger circuit.",

"Active Wave Shaping": "Experiment with active clipper and clamper circuits.",

"RC Phase Shift Oscillator": "Simulate the frequency and component requirements for an RC phase shift oscillator.",

"Wien Bridge Oscillator": "Simulate the frequency and component requirements for a Wien Bridge oscillator.",

"Square Wave Generator": "Design and simulate an op-amp based square wave generator (astable multivibrator).",

"Active Filter": "Analyze the frequency response of active lowpass and highpass filters."

}

cols = st.columns(3)

col\_index = 0

for exp\_title, exp\_desc in experiments.items():

with cols[col\_index]:

with st.expander(exp\_title):

st.write(exp\_desc)

if st.button("Launch Simulation", key=f"launch\_{exp\_title}", use\_container\_width=True):

navigate\_to(exp\_title)

col\_index = (col\_index + 1) % 3

st.markdown("---")

st.write("Developed by Dr. Damodar Panigrahy, Assistant Professor, Department of ECE, SRMIST, Kattankulathur.")

# --- Main App Logic ---

if st.session\_state.page == 'home':

show\_home\_page()

elif st.session\_state.page == 'Basic Op-Amp Simulator':

show\_basic\_op\_amp\_simulator()

else:

st.header(st.session\_state.page)

st.button("Return to Home", on\_click=navigate\_to, args=('home',))

st.warning("This experiment is not yet implemented. Please select another one.")