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package com.example.programmingassignment1;
// Author: Junsu Yoon, Oct 24, CNIT 355
//Backend for Main Form (Calculations)
import android.content.Intent;
import android.graphics.Color;
import android.os.Bundle;
import android.text.Editable;
import android.text.TextWatcher;
import android.view.Gravity;
import android.view.View;
import android.widget.AdapterView;
import android.widget.AdapterView.OnItemClickListener;
import android.widget.AdapterView.OnItemSelectedListener;
import android.widget.EditText;
import android.widget.ImageView;
import android.widget.Spinner;
import android.widget.TableLayout;
import android.widget.TableRow;
import android.widget.TextView;

import androidx.appcompat.app.AppCompatActivity;

import java.util.LinkedHashMap;
import java.util.Locale;
import java.util.Map;

public class MainActivity extends AppCompatActivity {

    private EditText etInput;
    private Spinner spFrom;
    private TableLayout tableResults;

    private String currentMode = "length"; // length | weight | temperature | help

    // 길이(기준: m), 무게(기준: g)
    private final Map<String, Double> LENGTH_TO_M = new LinkedHashMap<>();
    private final Map<String, Double> WEIGHT_TO_G = new LinkedHashMap<>();
    // 온도 단위 배열
    private final String[] TEMP_UNITS = new String[]{"°C", "°F", "K"};

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);

        etInput = findViewById(R.id.etInput);
        spFrom = findViewById(R.id.spFrom);
        tableResults = findViewById(R.id.tableResults);

        ImageView imgLength = findViewById(R.id.imageLength);
        ImageView imgTemperature = findViewById(R.id.imageTemperature);
        ImageView imgWeight = findViewById(R.id.imageWeight);
        ImageView imgHelp = findViewById(R.id.imageHelp);

        initUnitMaps();

        // 입력 변경 → 업데이트
        etInput.addTextChangedListener(new TextWatcher() {
            @Override public void beforeTextChanged(CharSequence s, int st, int c, int a) {}
            @Override public void onTextChanged(CharSequence s, int st, int b, int c) { updateResults(); }
            @Override public void afterTextChanged(Editable s) {}
        });

        // 스피너 변경 → 업데이트
        spFrom.setOnItemSelectedListener(new android.widget.AdapterView.OnItemSelectedListener() {
            @Override public void onItemSelected(android.widget.AdapterView<?> parent, View view, int position, long id) { updateResults(); }
            @Override public void onNothingSelected(android.widget.AdapterView<?> parent) {}
        });

        // 탭 클릭 → 모드 전환
        imgLength.setOnClickListener(v -> setMode("length", imgLength));
        imgTemperature.setOnClickListener(v -> setMode("temperature", imgTemperature));
        imgWeight.setOnClickListener(v -> setMode("weight", imgWeight));

        // Help 탭은 별도 Activity 이동 (activity_help.java)
        imgHelp.setOnClickListener(v -> {
            Intent intent = new Intent(MainActivity.this, activity_help.class);
            startActivity(intent);
        });

        // ★ 초기 모드: Help에서 넘어온 인텐트의 "mode" 값 우선 적용
        String modeFromIntent = getIntent().getStringExtra("mode");
        if (modeFromIntent != null) {
            switch (modeFromIntent) {
                case "length":
                    setMode("length", imgLength);
                    break;
                case "weight":
                    setMode("weight", imgWeight);
                    break;
                case "temperature":
                    setMode("temperature", imgTemperature);
                    break;
                default:
                    setMode("length", imgLength);
                    break;
            }
        }
    }
}

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    }
} else {
    // 기본: Length 모드
    setMode("length", imgLength);
}
}

/* ----- 단위 초기화 ----- */
private void initUnitMaps() {
    // 길이 (1 unit = x m)
    LENGTH_TO_M.put("mm", 0.001);
    LENGTH_TO_M.put("cm", 0.01);
    LENGTH_TO_M.put("m", 1.0);
    LENGTH_TO_M.put("km", 1000.0);
    LENGTH_TO_M.put("inch", 0.0254);
    LENGTH_TO_M.put("ft", 0.3048);
    LENGTH_TO_M.put("yd", 0.9144);
    LENGTH_TO_M.put("mile", 1609.34);

    // 무게 (1 unit = x g)
    WEIGHT_TO_G.put("mg", 0.001);
    WEIGHT_TO_G.put("g", 1.0);
    WEIGHT_TO_G.put("kg", 1000.0);
    WEIGHT_TO_G.put("oz", 28.349523125);
    WEIGHT_TO_G.put("lb", 453.59237);
    WEIGHT_TO_G.put("ton", 1_000_000.0);
}

/* ----- 모드 전환 ----- */
private void setMode(String mode, ImageView selectedTab) {
    currentMode = mode;
    highlightTab(selectedTab);

    // 스피너 항목 세팅 & 표시
    switch (currentMode) {
        case "length":
            spFrom.setVisibility(View.VISIBLE);
            setSpinnerItems(LENGTH_TO_M.keySet().toArray(new String[0]), "m");
            break;
        case "weight":
            spFrom.setVisibility(View.VISIBLE);
            setSpinnerItems(WEIGHT_TO_G.keySet().toArray(new String[0]), "g");
            break;
        case "temperature":
            spFrom.setVisibility(View.VISIBLE);
            setSpinnerItems(TEMP_UNITS, "°C");
            break;
    }

    updateResults();
}

private void setSpinnerItems(String[] items, String defaultUnit) {
    ArrayAdapter<String> adapter = new ArrayAdapter<>(
        this, android.R.layout.simple_spinner_item, items
    );
    adapter.setDropDownViewResource(android.R.layout.simple_spinner_dropdown_item);
    spFrom.setAdapter(adapter);

    int defaultIdx = 0;
    for (int i = 0; i < items.length; i++) {
        if (items[i].equals(defaultUnit)) { defaultIdx = i; break; }
    }
    spFrom.setSelection(defaultIdx);
}

/* ----- 변환 결과 ----- */
private void updateResults() {
    if (tableResults == null) return;

    int count = tableResults.getChildCount();
    if (count > 1) tableResults.removeViews(1, count - 1);

    String text = etInput.getText().toString().trim();
    if (text.isEmpty()) return;

    double value;
    try { value = Double.parseDouble(text); }
    catch (NumberFormatException e) { return; }

    switch (currentMode) {
        case "length": renderLength(value); break;
        case "weight": renderWeight(value); break;
        case "temperature": renderTemperature(value); break;
    }
}

private void renderLength(double value) {
    String from = (String) spFrom.getSelectedItemAt();
    double fromFactor = LENGTH_TO_M.get(from);
    double inMeters = value * fromFactor;

    for (Map.Entry<String, Double> e : LENGTH_TO_M.entrySet()) {
        String unit = e.getKey();
    }
}

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        double converted = inMeters / e.getValue();
        addRow(fmt(converted), unit);
    }
}

private void renderWeight(double value) {
    String from = (String) spFrom.getSelectedItem();
    double fromFactor = WEIGHT_TO_G.get(from);
    double inGrams = value * fromFactor;

    for (Map.Entry<String, Double> e : WEIGHT_TO_G.entrySet()) {
        String unit = e.getKey();
        double converted = inGrams / e.getValue();
        addRow(fmt(converted), unit);
    }
}

private void renderTemperature(double value) {
    String from = (String) spFrom.getSelectedItem();

    double celsius;
    switch (from) {
        case "°C": celsius = value; break;
        case "°F": celsius = (value - 32) * 5.0 / 9.0; break;
        case "K": celsius = value - 273.15; break;
        default: celsius = value;
    }

    addRow(fmt2(celsius), "°C");
    addRow(fmt2(celsius * 9.0 / 5.0 + 32), "°F");
    addRow(fmt2(celsius + 273.15), "K");
}

/* ----- 유틸 ----- */
private String fmt(double v) {
    double abs = Math.abs(v);
    if (abs >= 1000 || abs < 0.001)
        return String.format(Locale.US, "%.4E", v);
    else
        return String.format(Locale.US, "%.4f", v);
}

private String fmt2(double v) {
    return String.format(Locale.US, "%.2f", v);
}

private void addRow(String value, String unit) {
    TableRow row = new TableRow(this);
    row.setPadding(6, 6, 6, 6);
    row.setBackgroundColor(Color.parseColor("#F5F5F5"));

    TextView tvVal = new TextView(this);
    tvVal.setText(value);
    tvVal.setTextColor(Color.parseColor("#1976D2"));
    tvVal.setTextSize(18);
    tvVal.setGravity(Gravity.CENTER);

    TextView tvUnit = new TextView(this);
    tvUnit.setText(unit);
    tvUnit.setTextColor(Color.parseColor("#424242"));
    tvUnit.setTextSize(16);
    tvUnit.setGravity(Gravity.CENTER);

    TableRow.LayoutParams lp = new TableRow.LayoutParams(0, TableRow.LayoutParams.WRAP_CONTENT, 1f);
    tvVal.setLayoutParams(lp);
    tvUnit.setLayoutParams(lp);

    row.addView(tvVal);
    row.addView(tvUnit);
    tableResults.addView(row);
}

private void highlightTab(ImageView selected) {
    int normal = Color.parseColor("#E0E0E0");
    int selectedColor = Color.parseColor("#BDBDBD");

    findViewById(R.id.imageLength).setBackgroundColor(normal);
    findViewById(R.id.imageTemperature).setBackgroundColor(normal);
    findViewById(R.id.imageWeight).setBackgroundColor(normal);
    findViewById(R.id.imageHelp).setBackgroundColor(normal);

    if (selected != null) selected.setBackgroundColor(selectedColor);
}
}

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