Your explanations of the violations of the principle of optimality in the shortest path problem with negative edge weights and the traveling salesman problem with triangle inequality violations are correct and thorough. Let me summarize the main points:

1. \*\*Shortest Path Problem with Negative Edge Weights\*\*:

- In the presence of negative edge weights, particularly negative cycles, the principle of optimality can be violated.

- A path can be made arbitrarily short by traversing a negative cycle repeatedly, leading to a situation where there is no well-defined shortest path.

- Consequently, optimal solutions to subproblems may not lead to an optimal overall solution.

2. \*\*Traveling Salesman Problem with Triangle Inequality Violation\*\*:

- The principle of optimality may fail when the triangle inequality is violated.

- If the distance between two cities is greater than the sum of distances via a third city, it may be optimal to skip certain segments of the path.

- As a result, the overall optimal path may not include all the local optimal paths, which can lead to a violation of the principle of optimality.

These examples highlight the importance of understanding the specific characteristics and constraints of the problem at hand. When these constraints deviate from those expected in classic applications of dynamic programming and optimization, the principle of optimality may no longer apply.

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Subject : 23MX27(Mobile Application Development

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Exercise 1, Qsn1

package com.example.ps1qsn1

import android.media.Image

import androidx.appcompat.app.AppCompatActivity

import android.os.Bundle

import android.widget.Button

import android.widget.ImageView

import android.widget.TextView

class MainActivity : AppCompatActivity() {

override fun onCreate(savedInstanceState: Bundle?) {

super.onCreate(savedInstanceState)

setContentView(R.layout.activity\_main)

val btn1 = findViewById<Button>(R.id.btn1)

val imgV1 = findViewById<ImageView>(R.id.imgV1)

val txtV1 =findViewById<TextView>(R.id.txtV1)

btn1.setOnClickListener({onBtnClick(imgV1, btn1)})

}

fun onBtnClick(imgV : ImageView, btn : Button)

{

btn.text = "I am so full"

imgV.setImageResource(R.drawable.smiley2)

}

}

<?xml version="1.0" encoding="utf-8"?>

<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"

xmlns:app="http://schemas.android.com/apk/res-auto"

xmlns:tools="http://schemas.android.com/tools"

android:layout\_width="match\_parent"

android:layout\_height="match\_parent"

android:orientation="vertical"

tools:context=".MainActivity">

<TextView

android:id="@+id/txtV1"

android:layout\_width="232dp"

android:layout\_height="46dp"

android:text="My Temperature converter"

android:textAlignment="textStart"

android:textSize="16sp"

app:layout\_constraintBottom\_toBottomOf="parent"

app:layout\_constraintEnd\_toEndOf="parent"

app:layout\_constraintStart\_toStartOf="parent"

app:layout\_constraintTop\_toTopOf="parent" />

<Space

android:layout\_width="match\_parent"

android:layout\_height="15dp" />

<TextView

android:id="@+id/txtV2"

android:layout\_width="239dp"

android:layout\_height="47dp"

android:text="Enter Fahrenheit Temp below"

android:textSize="16sp"

app:layout\_constraintBottom\_toBottomOf="parent"

app:layout\_constraintEnd\_toEndOf="parent"

app:layout\_constraintStart\_toStartOf="parent"

app:layout\_constraintTop\_toTopOf="parent" />

<Space

android:layout\_width="match\_parent"

android:layout\_height="15dp" />

<EditText

android:id="@+id/edTxt1"

android:layout\_width="230dp"

android:layout\_height="wrap\_content"

android:ems="10"

android:inputType="numberDecimal" />

<Space

android:layout\_width="match\_parent"

android:layout\_height="15dp" />

<TextView

android:id="@+id/txtV3"

android:layout\_width="239dp"

android:layout\_height="47dp"

android:text="Enter Celsius Temp below"

android:textSize="16sp" />

<EditText

android:id="@+id/edTxt2"

android:layout\_width="230dp"

android:layout\_height="wrap\_content"

android:ems="10"

android:inputType="numberDecimal" />

<Space

android:layout\_width="match\_parent"

android:layout\_height="30dp" />

<Button

android:id="@+id/btn1"

android:layout\_width="220dp"

android:layout\_height="77dp"

android:text="Convert temperature" />

<Space

android:layout\_width="match\_parent"

android:layout\_height="25dp" />

<TextView

android:id="@+id/txtV4"

android:layout\_width="232dp"

android:layout\_height="47dp"

android:text="TextView" />

</LinearLayout>