SECJ 3553 (02) – ARTIFICIAL INTELLIGENCE

SEMESTER 1 2022/2023

ASSIGNMENT 2

TITLE: SKINFLEX

GROUP: PIXEL PERFECT

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Table of Content

1.0 STATE SPACE SEARCH

1.1 Details of State and Action Graph

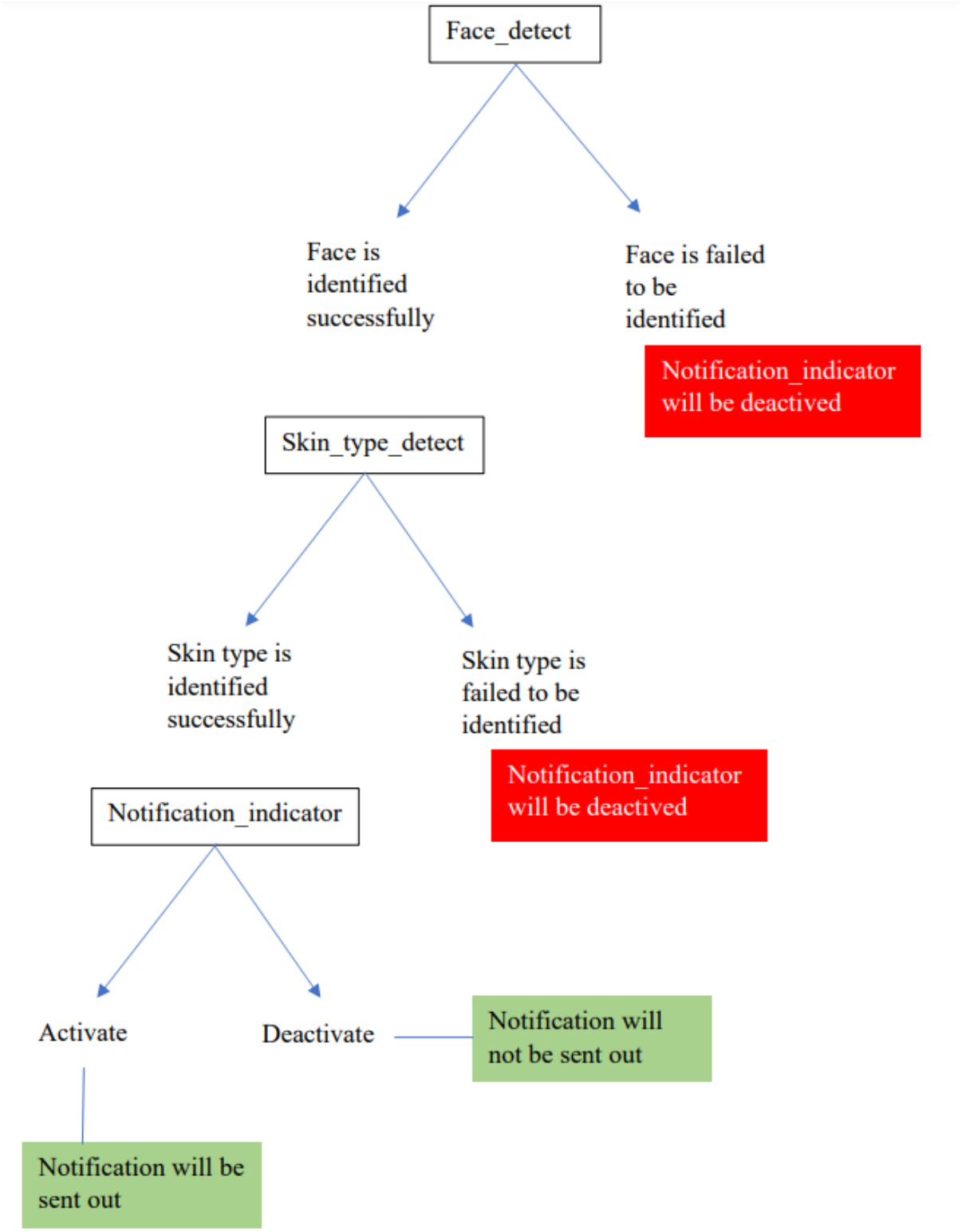
1st State: The face detector is activated to detect whether it can recognise a face or not. If face is recognised, it will remain still to perform the next state.

2nd State: After detecting the face, the skin type scanner will be activated to detect the skin type of the recognised face. In this state, there are **five** possible outcomes.

i) Normal skin,
ii) Dry skin,
iii) Oily skin,
iv) Sensitive skin,
v) Combination skin

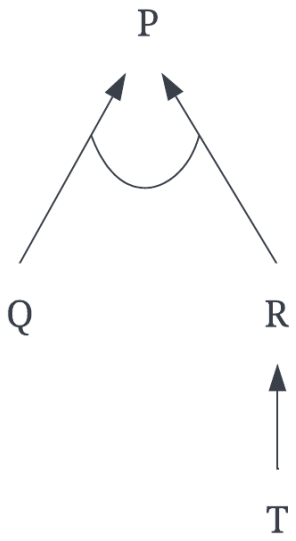
3rd State: After the skin type is identified, regardless of the skin type of the face, a notification will be sent to the device according to the result identified earlier.

Overview Action Graph



1.2 Hypergraph

P = Notification indicator deactivated
Q = Face is detected
R = Skin type is detected
T = **Current Notification Indicator activated**



P = Notification indicator deactivated
Q = Face is detected
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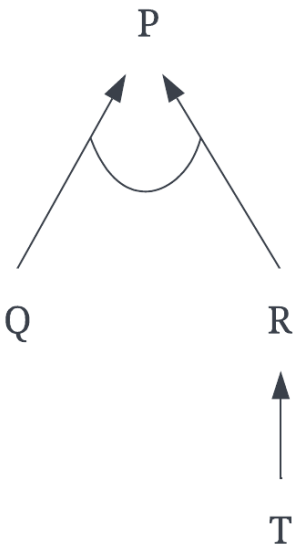


1.3 Problem Formulation

Initial State: The system needs to defect face and identify the skin type. Based on the skin type, some information and suggestions will be displayed.

Actions: To defect face and skin concerns.

Goal: Determine type of skin concerns.

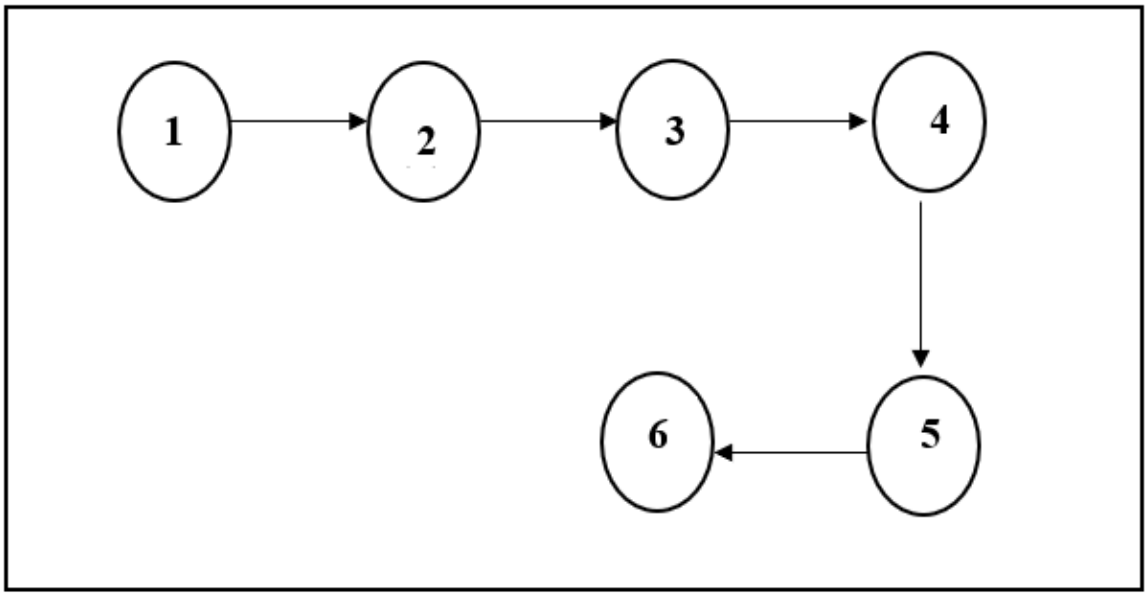
Path cost: One unit per action

1.3.1 Table of Problem Formulation

No.	Face Detector	Normal Skin Detector	Sensitive Skin Detector	Dry Skin Detector	Oily Skin Detector	Combination Skin Detector
1.	 Detected	 Neither tight or oily	 Undetected	 Undetected	 Undetected	 Undetected
2.	 Detected	 Undetected	 Red, irritated tight, patchy	 Undetected	 Undetected	 Undetected

3.	 Detected	 Undetected	 Undetected	 Tight	 Undetected	 Undetected
4.	 Detected	 Undetected	 Undetected	 Undetected	 Oily all over	 Undetected
5.	 Detected	 Undetected	 Undetected	 Dry cheeks	 Oily t-zone	 Oily t-zone and dry cheeks
6.	 Undetected	 Undetected	 Undetected	 Undetected	 Undetected	 Undetected

1.4 Sequence of Action Leading From Initial State to Goal State



1.5 Explanation of Formulate Problem To Support The Proposed KR

1. The face scanner detects a face and discerns the face as either tight or oily. As shown in KR1, if the face detects symptoms of a Normal Skin condition, the face scanner will produce and display the output of the face as “Normal Skin”.

2. Face scanner detects the presence of a face and perceives the face as red, irritated, tight, and patchy. In KR2, if the face detects a face having skin conditions similar to Sensitive Skin, it will display the output of face type as “Sensitive Skin”.

3. In this problem formulation, the face scanner detects a face and tight skin condition. In KR3 if a face scanner detects a face and skin condition resembling Dry Skin, the face scanner will produce and display output of face type as “Dry Skin”.

4. When the face scanner detects a face and discerns the face condition as having oily T-zone, the face scanner will then give output of the face having an “Oily Skin” type. This supports the KR4, where if a face is detected and a face condition similar to oily skin, oily skin will be detected.

5. In this formulation, the face is detected and possesses face problems of both dry skin and oily skin. The face scanner will produce output of the face having a “Combination Skin” type. In KR5, if the face is detected and both oily skin condition and dry skin condition is detected, the combination skin will also be detected.

6. If the face scanner indicates no face detected, then no skin condition will be detected and will produce a display of “No Face Detected.”. This proves KR6, when face detect is false, then normal skin, sensitive skin, dry skin, oily skin, and combination skin will also be false.

Task Distribution

Name	Task
TERENCE LOORTHANATHAN	1.2 Hypergraph
RISHMA FATHIMA BINTI BASHER	1.4 Sequence of Action Leading From Initial State to Goal State
MADINA SURAYA BINTI ZHARIN	1.3 Problem Formulation
ADRINA ASYIQIN BINTI MD ADHA	1.5 Explanation of formulate problem to support the proposed KR
NAYLI NABIHAH BINTI JASNI	1.1 Details of State and Action Graph