chatbot response function for initial input

```
def chatbot_response(user_input, live_kp, ref_kp):
    user_input = user_input.lower()

    if "squat posture" in user_input:
        return analyze_posture(live_kp, ref_kp)

    elif "how to squat" in user_input:
        return "To perform a proper squat, keep your feet shoulder-width apart, back straight, and knees behind your toes."

    elif "motivate" in user_input:
        return "You're doing great! Keep pushing! Proper form helps you stay strong and avoid injuries. Remember, consistency is key!"

    elif "other exercises" in user_input or "legs" in user_input:
        return "You can try lunges, deadlifts, or step-ups to strengthen your legs. These exercises complement squats and help build overall lower body strength."

    else:
        return "I can help with squat form analysis. Upload your live photo for posture correction or ask for workout tips!"
```

function to analyze poses and get keypoints

```
def analyze_posture(live_kp, ref_kp):
    feedback = []

    if live_kp is None or ref_kp is None:
        return "Pose detection failed. Please check your images."

    live_knee = live_kp[]
    live_toe = live_kp[]

    if live_knee[] > live_toe[]:
        feedback.append("Your knees are extending beyond your toes. Keep them behind your toes during the squat.")

    live_shoulder = live_kp[]
    live_hip = live_kp[]

    if abs(live_shoulder[] - live_hip[]) > abs(ref_kp[][] - ref_kp[][]):
```

```
        feedback.append("Your back is rounding. Try to keep your spine straight throughout the squat.")

    live_ankle = live_kp[]
    if live_hip[] < live_knee[]:
        feedback.append("You're not squatting deep enough. Aim to lower your hips below your knees.")

    live_heel = live_kp[]
    if abs(live_heel[] - live_toe[]) > 0.05:
        feedback.append("Your heels are lifting off the ground. Keep your feet flat for better stability.")

    live_knee_x = live_knee[]
    live_foot_x = live_toe[]
    if live_knee_x < live_foot_x:
        feedback.append("Your knees are collapsing inward. Make sure your knees track outward in line with your toes.")

    live_head = live_kp[]
    live_neck = live_kp[]
    if abs(live_head[] - live_neck[]) > 0.:
        feedback.append("Your head is tilting too much. Keep your head in a neutral position, looking forward.")

    if live_hip[] < live_knee[]:
        feedback.append("Your hips are dropping too low. Try to maintain better alignment between your hips and knees.")

    if not feedback:
        return "Your squat form looks great!"

    return " ".join(feedback)

def get_pose_keypoints(image):
    import cv2
    import mediapipe as mp

    mp_pose = mp.solutions.pose
    pose = mp_pose.Pose(static_image_mode=True,
                        model_complexity=2,
                        enable_segmentation=True,
                        min_detection_confidence=0.5)

    image_rgb = cv2.cvtColor(image, cv2.COLOR_BGR2RGB)
    results = pose.process(image_rgb)

    if not results.pose_landmarks:
```

```
        return None

    keypoints = []
    for landmark in results.pose_landmarks.landmark:
        keypoints.append((landmark.x, landmark.y, landmark.z))
    return keypoints
```

to take the input of images

```
def upload_images():
    from google.colab import files
    print("Upload the reference squat image:")
    reference_image_file = files.upload()

    print("Upload your live squat photo:")
    live_photo_file = files.upload()

    import cv2
    reference_image_path = list(reference_image_file.keys())[0]
    live_photo_path = list(live_photo_file.keys())[0]

    reference_image = cv2.imread(reference_image_path)
    live_photo = cv2.imread(live_photo_path)

    return reference_image, live_photo
```

basic chat with chatbot

```
def run_chatbot():
    reference_image, live_photo = upload_images()

    ref_kp = get_pose_keypoints(reference_image)
    live_kp = get_pose_keypoints(live_photo)

    print("Chatbot: Hello! How can I assist you today with your squat form or workout
routine?")
    user_input = input("You: ")
    response = chatbot_response(user_input, live_kp, ref_kp)
    print("Chatbot:", response)

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```