Capital University of Science & Technology

Term Project Proposal

Department of Electrical and Computer Engineering

Project Title	Heart Rate Zone Calculator for Workouts
Course Title	Application of Information and Communication Technologies Lab

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Idea:

Heart rate zone calculator for workouts is designed to help individuals and athletes optimize their workout intensity based on their heart rate. It uses the Karvonen Method to calculate personalized heart rate zones by factoring in the user's age and resting heart rate. This personalized approach helps users train smarter by targeting specific heart rate zones aligned with their fitness goals, such as fat burning, endurance improvement, or peak athletic performance. The project provides an easy, efficient fitness monitoring tool for improvement based on fundamental programming techniques like control structures, functions, if-else statements, and switch cases.

Objectives:

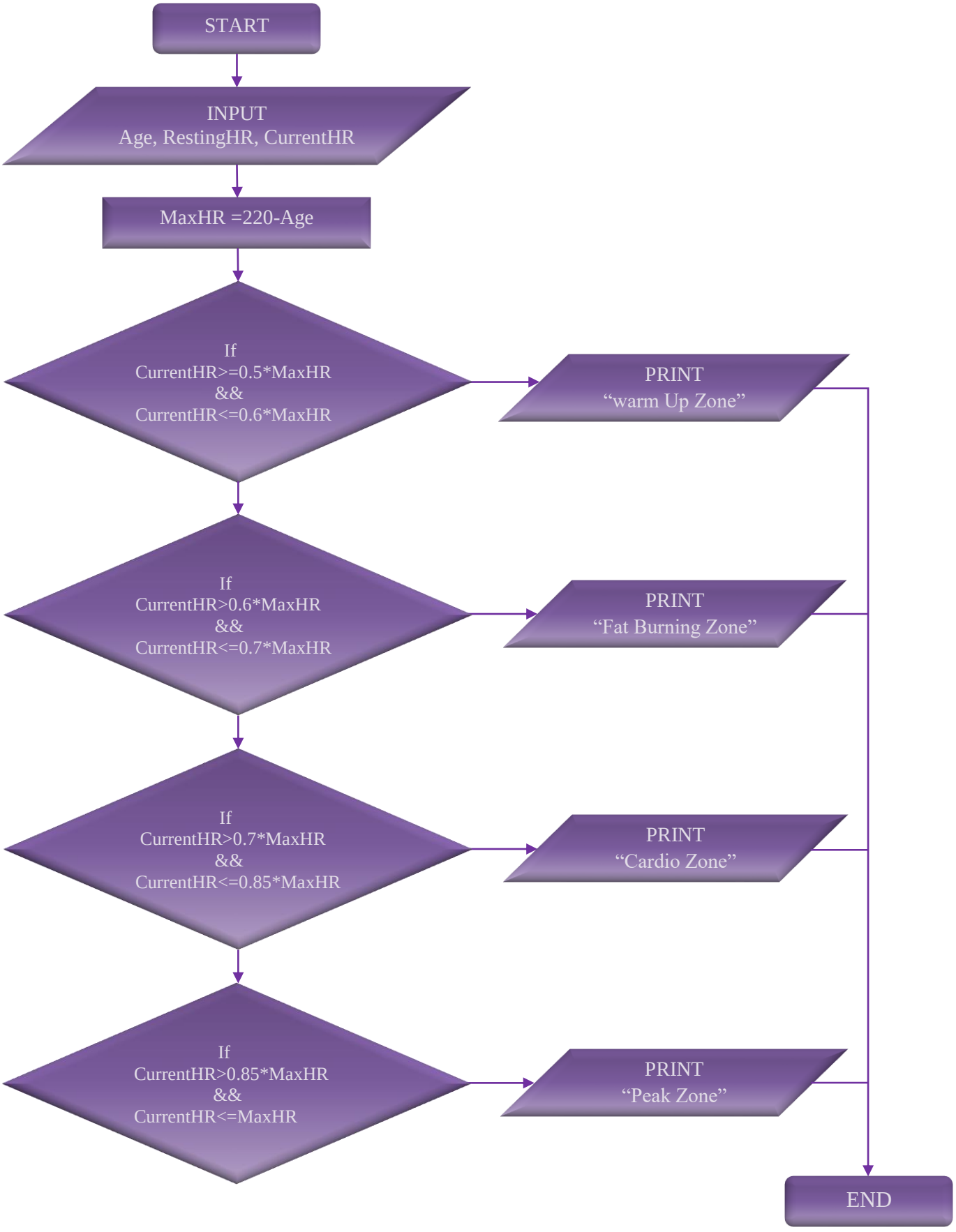
- **Accurate Calculation:** Implement the Karvonen Method to calculate heart rate zones based on age and resting heart rate.
- **User-Friendly Interface:** Develop an interactive console-based C++ program that is easy for users to navigate.
- **Control Structures Usage:** Demonstrate the use of if-else statements and switch cases for decision-making and output control.
- **Personalization:** Allow users to enter their data for personalized heart rate zone results.

- **Educational Value:** Help users understand the importance of heart rate monitoring in workouts.
- **Programming Skill Development:** Reinforce programming fundamentals like loops, functions, and data handling in C++.

Applications:

- **Personal Fitness:**
  - Aids individuals to design specific exercise routine according to heart rate zones.
  - Help users track intensity to ensure efficient fat burning and cardiovascular fitness.
- **Professional Coaching:**
  - Fitness instructors can utilize the calculator to create heart rate-based exercise programs.
  - Ideal for athletic training and performance management.
- **Cardiac and Health Monitoring:**
  - Ideal for cardiac rehabilitation, therefore it can be used for heart rate-controlled exercise programs.
  - Facilitates elderly people maintain safe workout intensity levels.
- **Wearable Technology Integration:**
  - Logic can be added to wearables such as a fitness band or smart watch, which could allow for heart rate monitoring in real time.
- **Educational and Research:**
  - Could be extended for application in physiological research and studies in fitness.

Flowchart:


START
INPUT
Age, RestingHR, CurrentHR
MaxHR =220-Age
If
CurrentHR>=0.5*MaxHR
&&
CurrentHR<=0.6*MaxHR
PRINT
“warm Up Zone”
If
CurrentHR>0.6*MaxHR
&&
CurrentHR<=0.7*MaxHR
PRINT
“Fat Burning Zone”
If
CurrentHR>0.7*MaxHR
&&
CurrentHR<=0.85*MaxHR
PRINT
“Cardio Zone”
If
CurrentHR>0.85*MaxHR
&&
CurrentHR<=MaxHR
PRINT
“Peak Zone”
END

Instructor Remarks

Student 1 Signature: _____

Student 2 Signature: _____

Instructor's Signature: _____

Date: _____