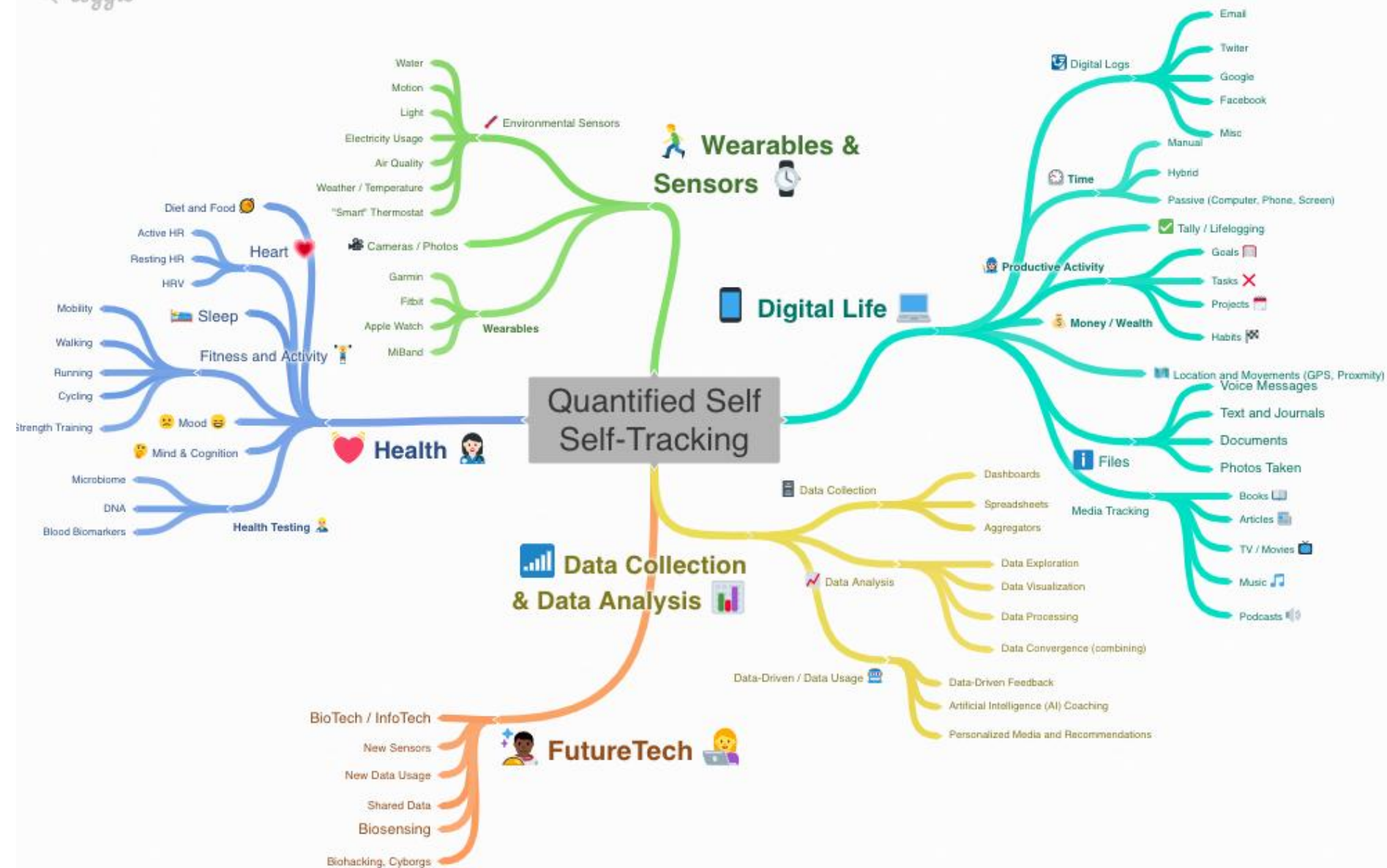




# AI assisted health care

< coggle



# Why code?

1. Enhances Problem-Solving Skills
2. Boosts Career Opportunities
3. Improves Digital Literacy
4. Empowers Innovation
5. Promotes Career Flexibility
6. Teaches Persistence and Resilience
7. Fosters Creativity
8. Enhances Collaboration
9. Enables Automation
10. Prepares for the Future
11. Encourages Lifelong Learning
12. Makes You a Better Consumer of Technology

Many jobs in UI/UX and Coding.  
Understand Developer's POV to be  
a leader



[Hacking The Bank Accounts Of The Richest People In The World | Mr. Robot](#)

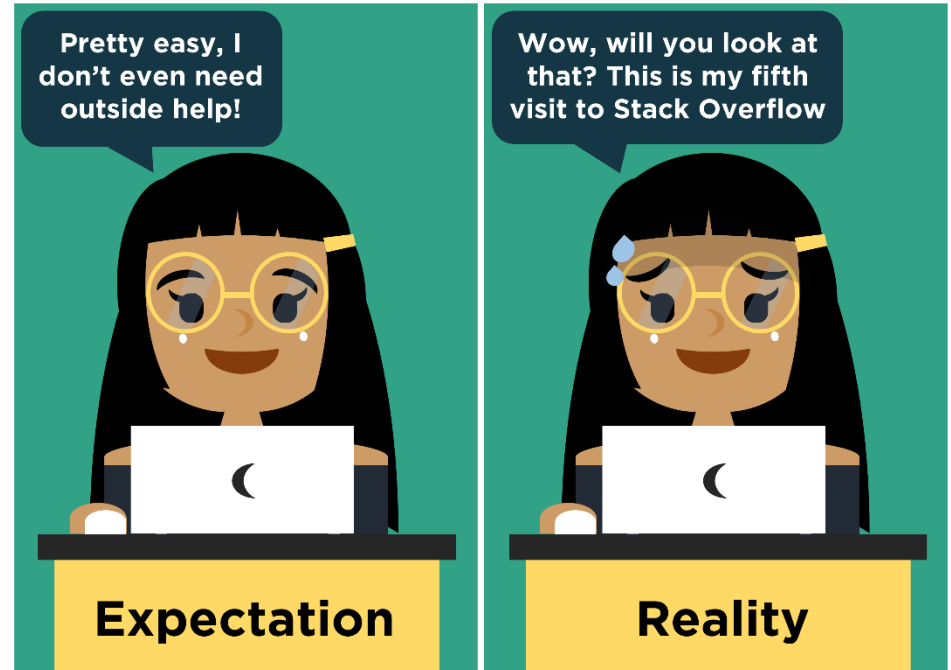


Other applications of programming?

# Programming

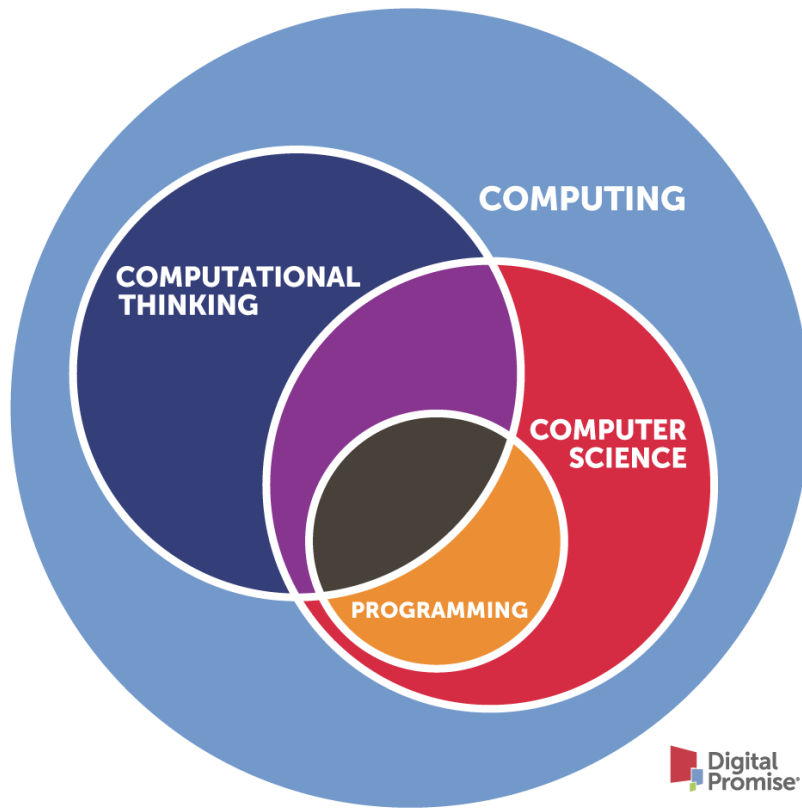
- Programming – instruction to perform task
- English or Hindi – grammar, similarly programming languages have syntax
- How would a calculator add two numbers?

“Programmers: Expectation VS Reality”



fb: Guen's Comics tw/ig: @guenscomics

# Algorithm design

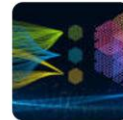


Here are some examples of computational thinking:



## Decomposition

Breaking down a problem into smaller, more manageable parts. For example, you can break down a task like cleaning your house into a list of subtasks. [🔗](#)



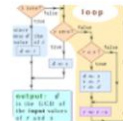
## Pattern recognition

Identifying similarities or trends in data to simplify problems. For example, you can look for patterns in data to categorize and process it more effectively. [🔗](#)



## Abstraction

Focusing on the most important details of a problem and ignoring the rest. For example, you can filter out unnecessary details to define the problem and simplify the solution. [🔗](#)



## Algorithm design

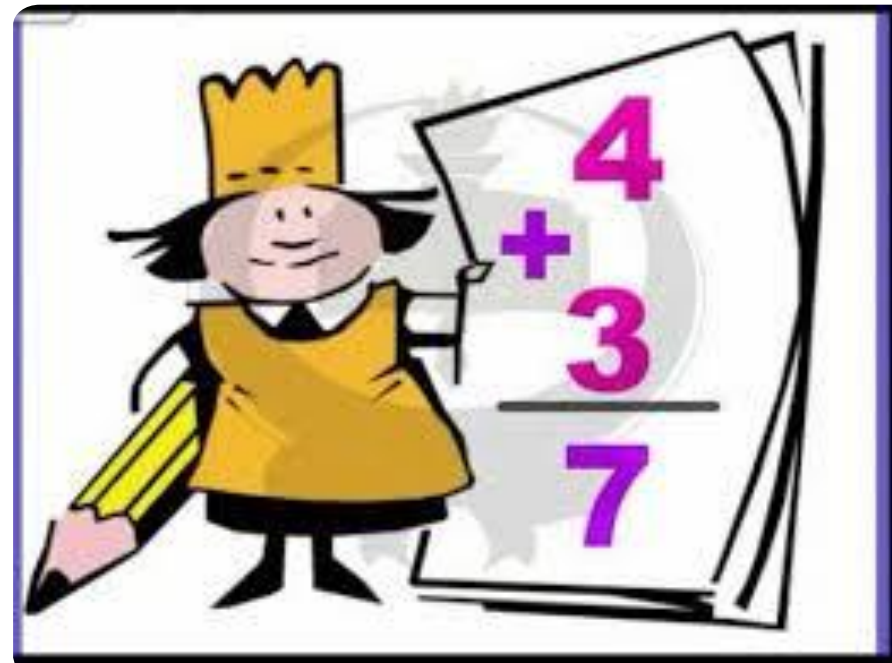
Creating a step-by-step guide for solving a problem. For example, you can create a recipe for baking a cake or instructions for building furniture. [🔗](#)

Steps in the algorithm to go to the train station, cooking something?

# Algorithm for adding two numbers

- Input number 1
- Input number 2
- Add number1 and number 2
- Print the result.

Multiply two numbers?  
Divide two numbers?



## Guessing the personality/number?

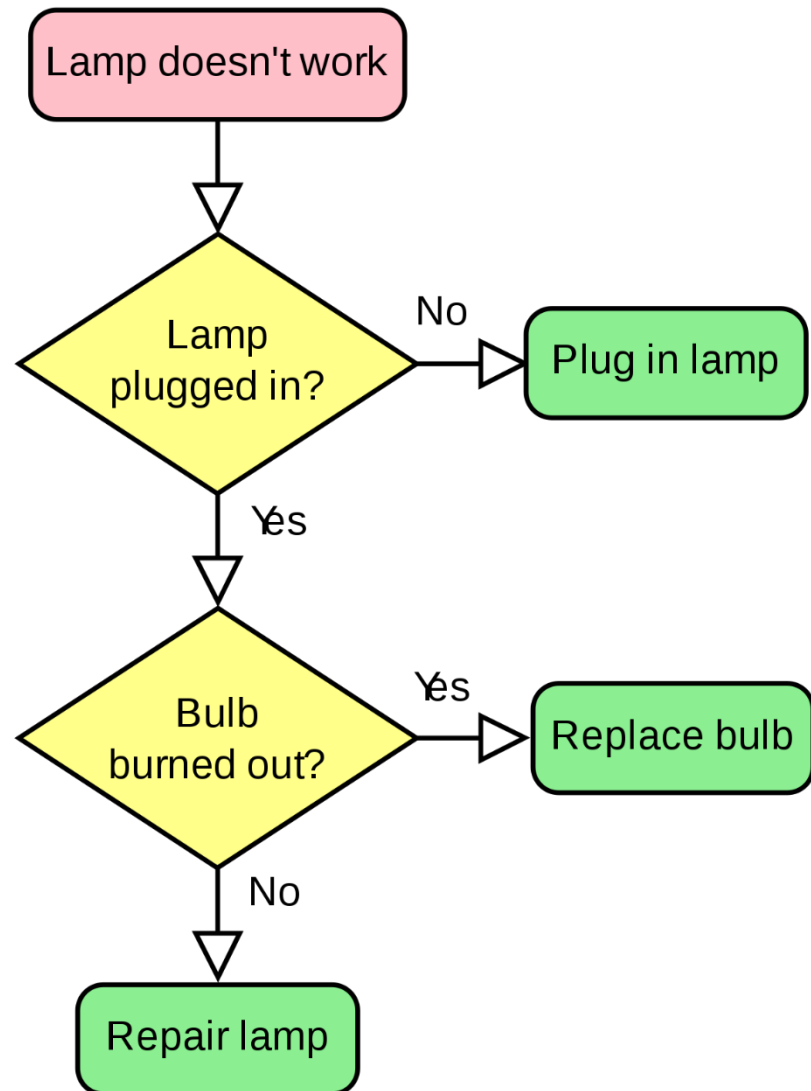
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- Twenty Questions.
- How to guess a number between 1 and 100 in minimum tries?
- How could a computer program do this?



# Flowchart

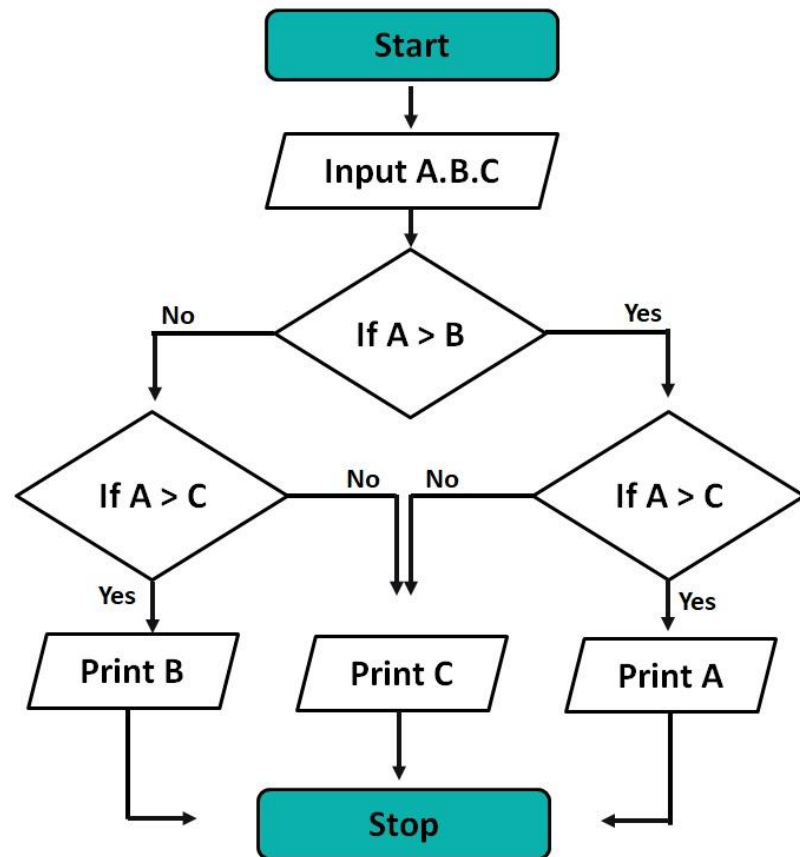
- Languages have different syntax but are largely similar.
- Learn one language and you can learn others quickly.
- Flowchart/Algorithm is the key.



# Flowchart for largest of three numbers

teachoo

## Flowchart to print largest of three numbers



| Programming Language | Application                                                                                                  |
|----------------------|--------------------------------------------------------------------------------------------------------------|
| C                    | Microcontroller/ Embedded programming, Efficient at runtime. 95% embedded programming in C.                  |
| Python               | One of the best to teach programming, Scientific computations, Raspberry Pi. Efficient in development times. |
| Javascript           | Creating web pages. Run in browsers. HTML+CSS+Javascript                                                     |
| App Inventor         | Graphical language, flowchart based for children. Scratch similar to it.                                     |
| Processing           | GUI for Arduino                                                                                              |
| Visual Basic         | Windows based, Event based programming, Easy to build GUI, VBA in Excel.                                     |
| .NET                 | Software framework from Microsoft                                                                            |

App  
Inventor



**MIT**  
**APP INVENTOR**

# Inspiring projects using MIT App Inventor

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## Trash Toss!

Sept. 22, 2022, 5:35 p.m. Likes: 2 ♥



Learn how to properly dispose of trash and recycleables in this sorting game. Different types of trash will appear at the top of the screen. The player swipes them to the bin that they think the trash should be thrown away in, keeping in mind being enviornmentally friendly.



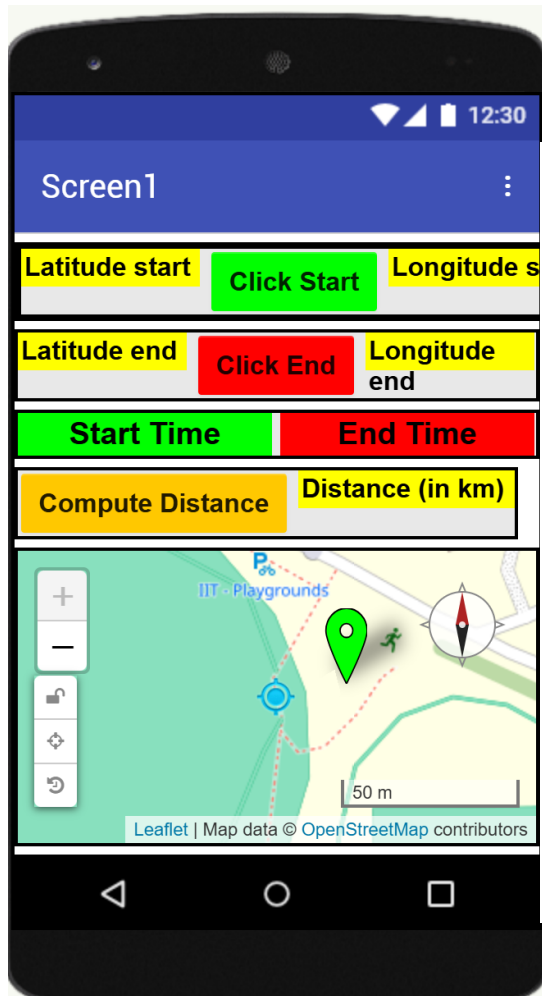
[App link](#): Explore more apps and share one that you like? [Example Projects](#)

Abhishek's App: PlanetPlus

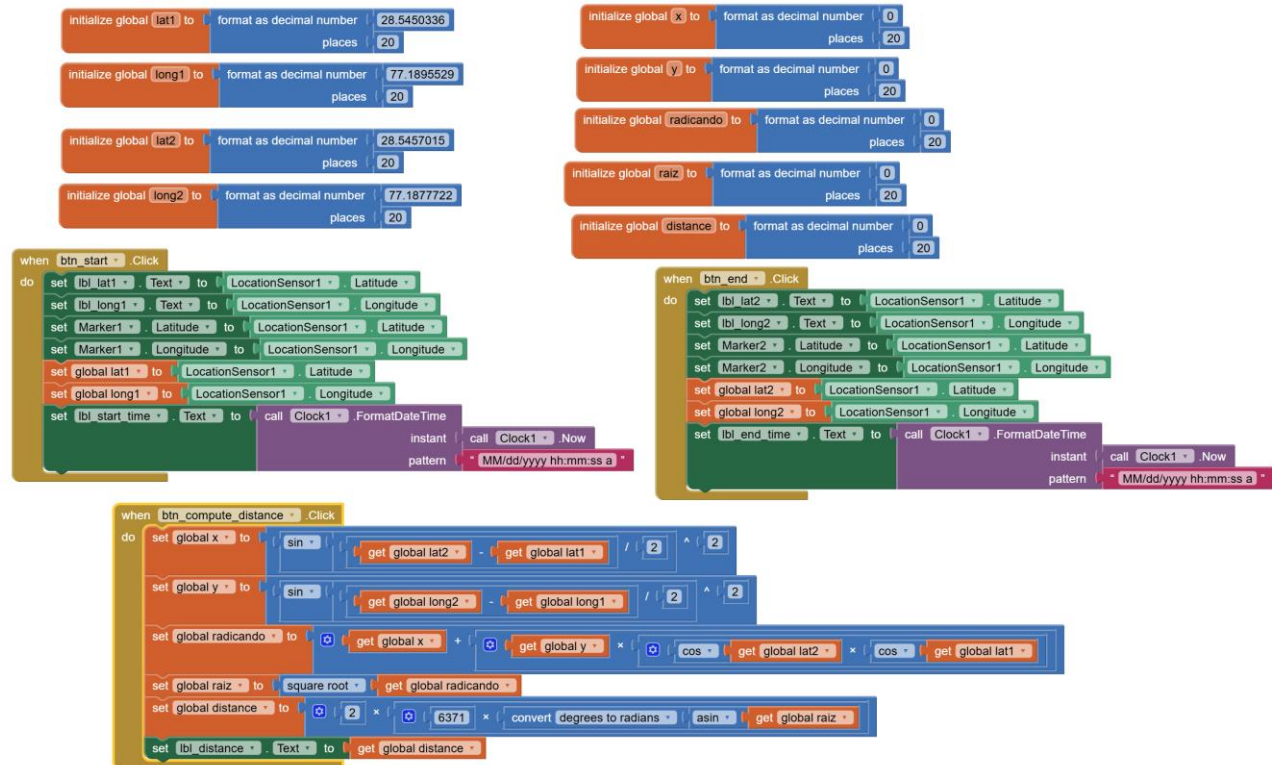
Popular apps on MIT App Inventor

# Fitness App that tracks distance

## Spiral 1



Google Maps App to be turned on and used in split view screen mode



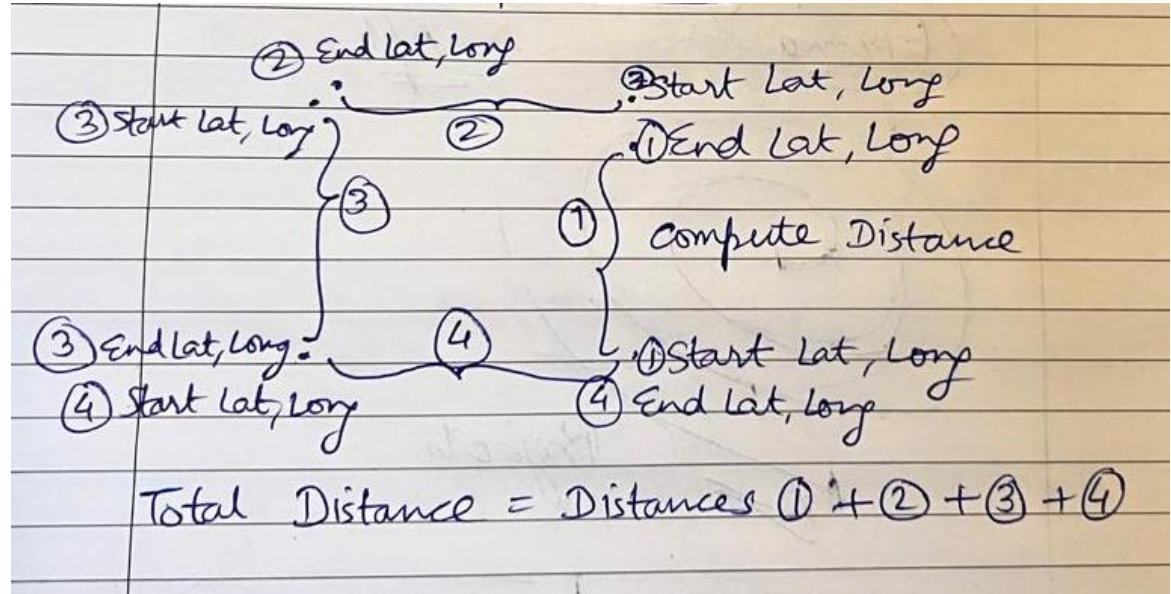
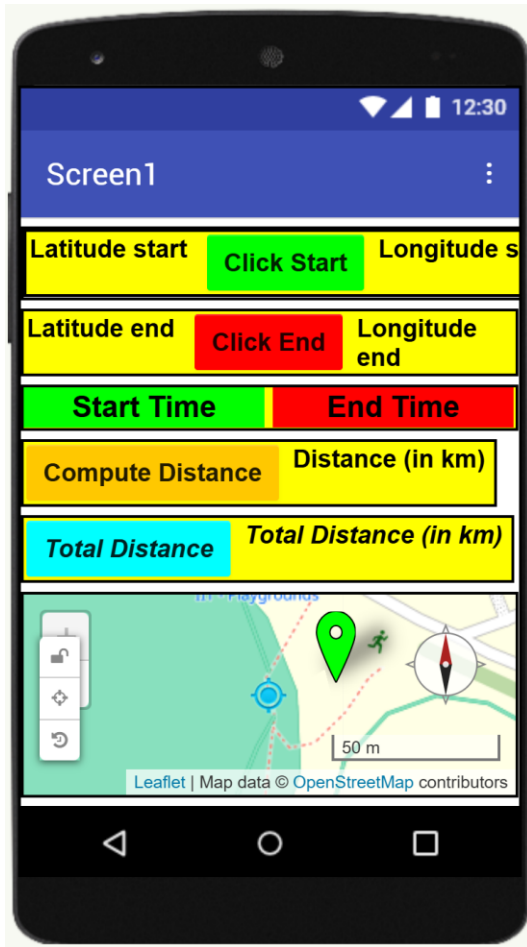
Haversine Formula

$$d = 2r \arcsin \left( \sqrt{\underbrace{\sin^2 \left( \frac{\text{lat2} - \text{lat1}}{2} \right)}_X + \cos(\text{lat1}) \cos(\text{lat2}) \underbrace{\sin^2 \left( \frac{\text{lon2} - \text{lon1}}{2} \right)}_Y} \right)$$

**radicando**

# Fitness App that tracks distance

## Spiral 2



Additional code over Spiral 1

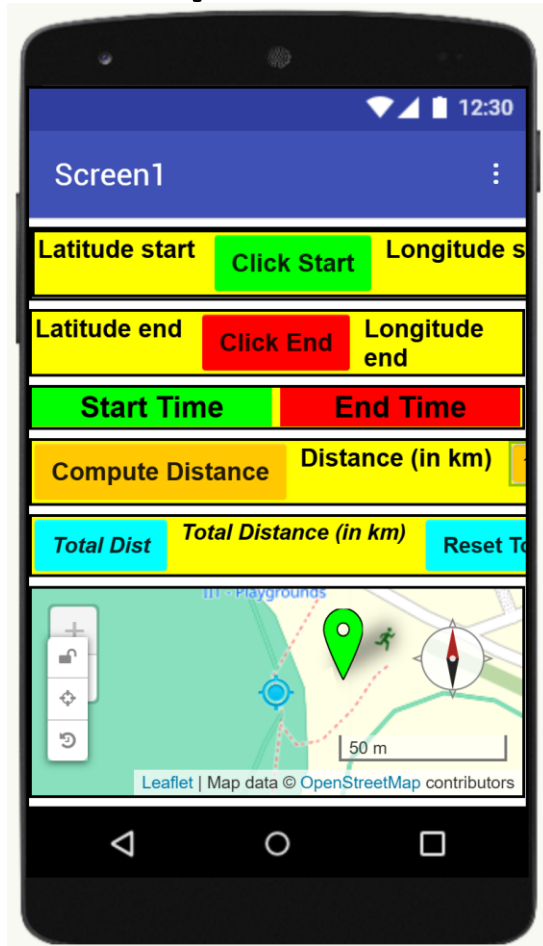
initialize global `total_distance` to `format as decimal number` `0` places `20`

Google Maps App to be turned on and used in split view screen mode

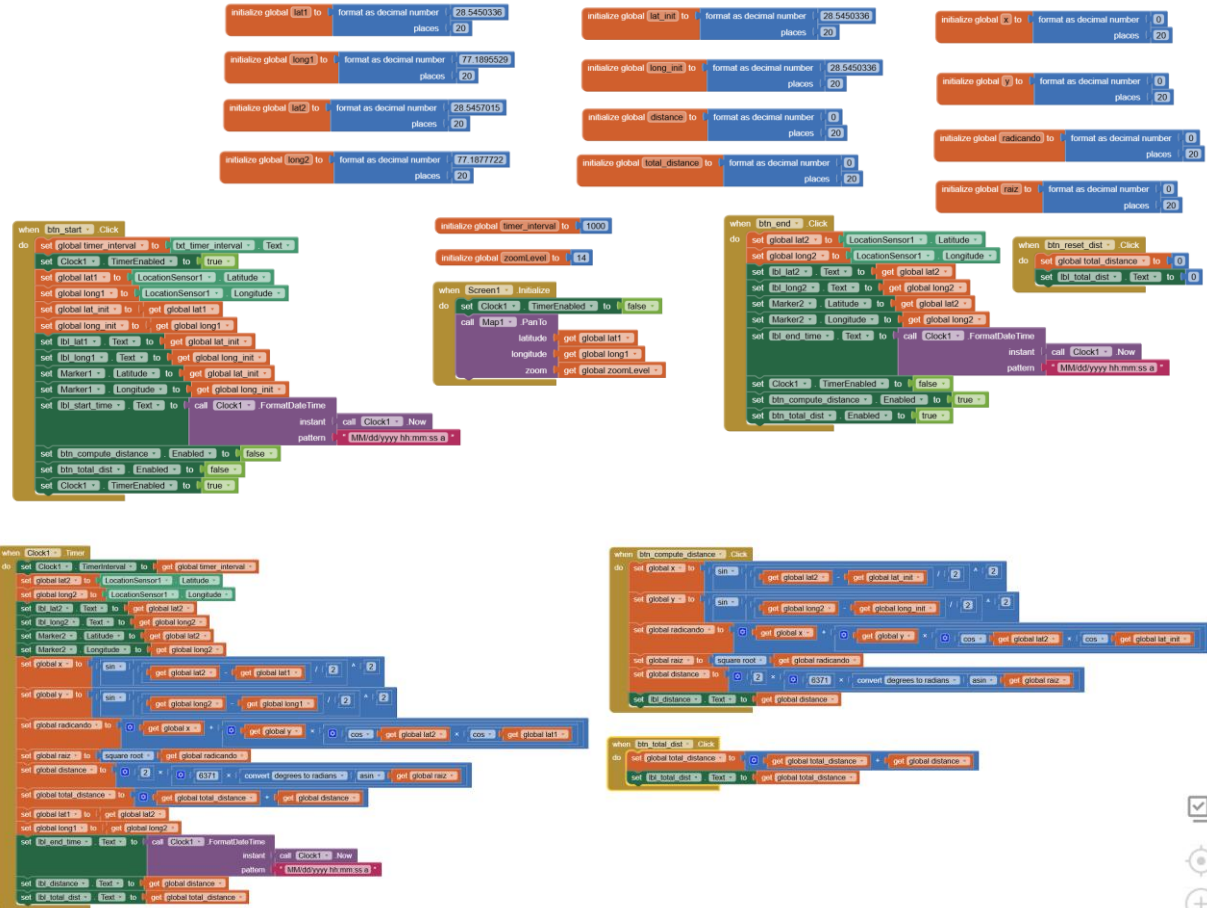


```
when btn_total_dist .Click
do
  set global total_distance to (get global total_distance + get global distance)
  set lbl_total_dist .Text to get global total_distance
```

# Fitness App that tracks distance Spiral 3



Google Maps App to be  
turned on and used in  
split view screen mode

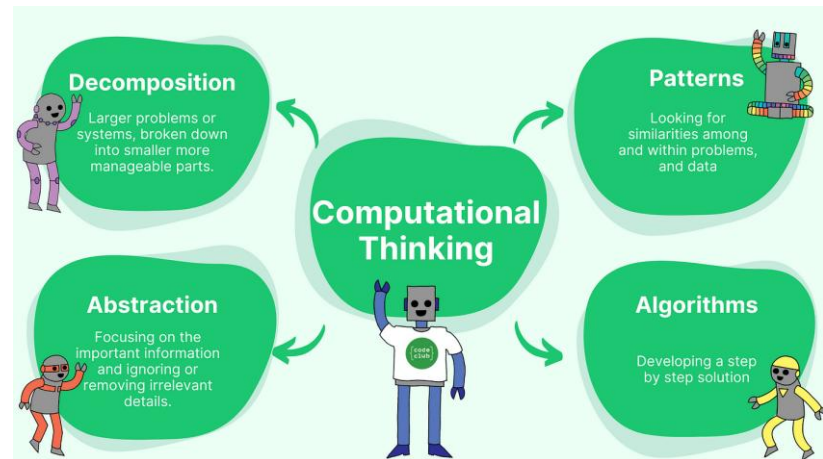


Algorithm:

1. Measure Lat1, Long1. Place Marker at this Lat1, Long1.
2. With Timer on:  
Measure Lat2, Long2. Place Marker at this Lat2, Long2.  
Calculate Distance using Haversine Formula.  
Total Distance = Total Distance + Distance.  
New Lat1, Long1 = Lat2, Long2.  
Keep Looping.

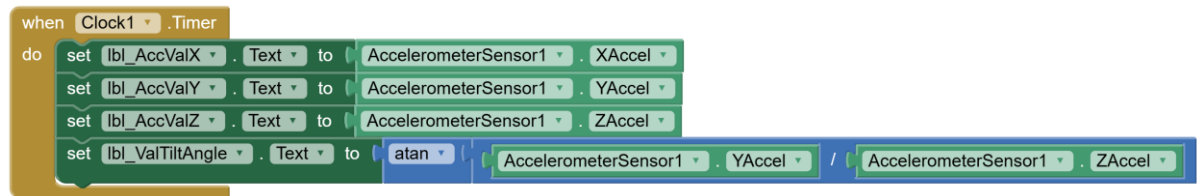
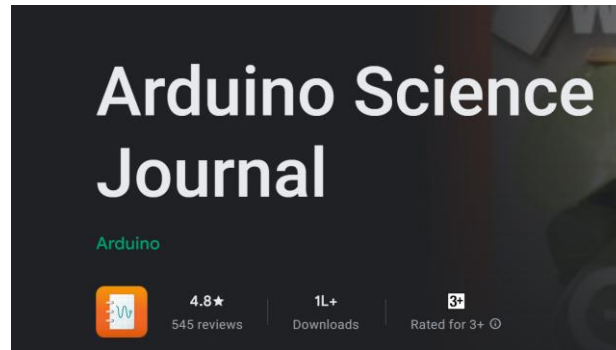
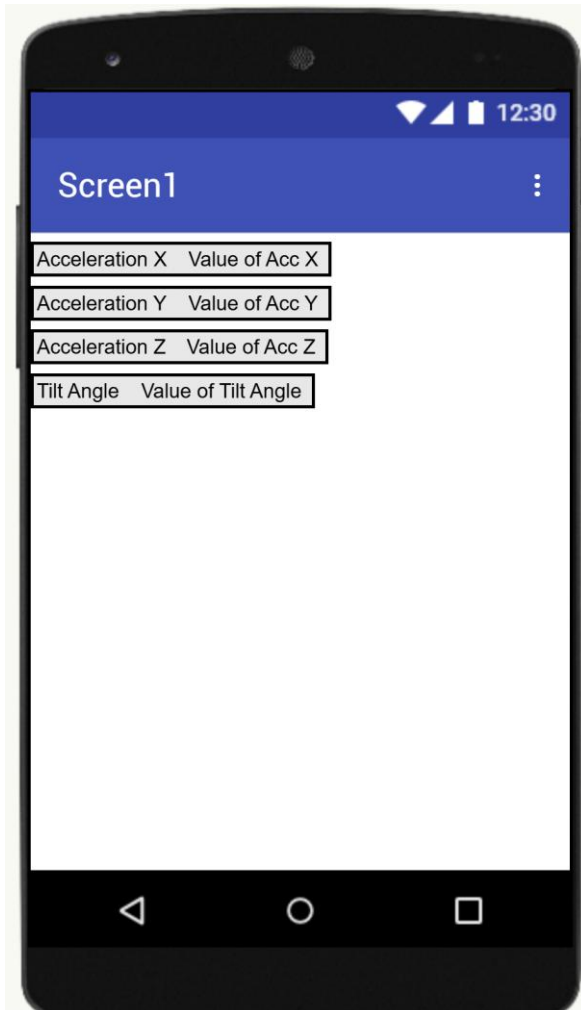
# Next Steps

- How could be improve the UI/UX for the Distance Tracking App?
- How to make a good UI on MIT App Inventor = Strava, GPS
- Computational Thinking, Bottom Up Debugging, Spiral Development, Modularity
- Other sensors and features of MIT App Inventor

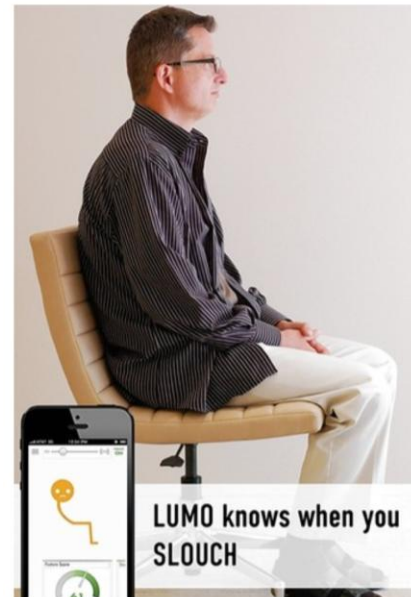
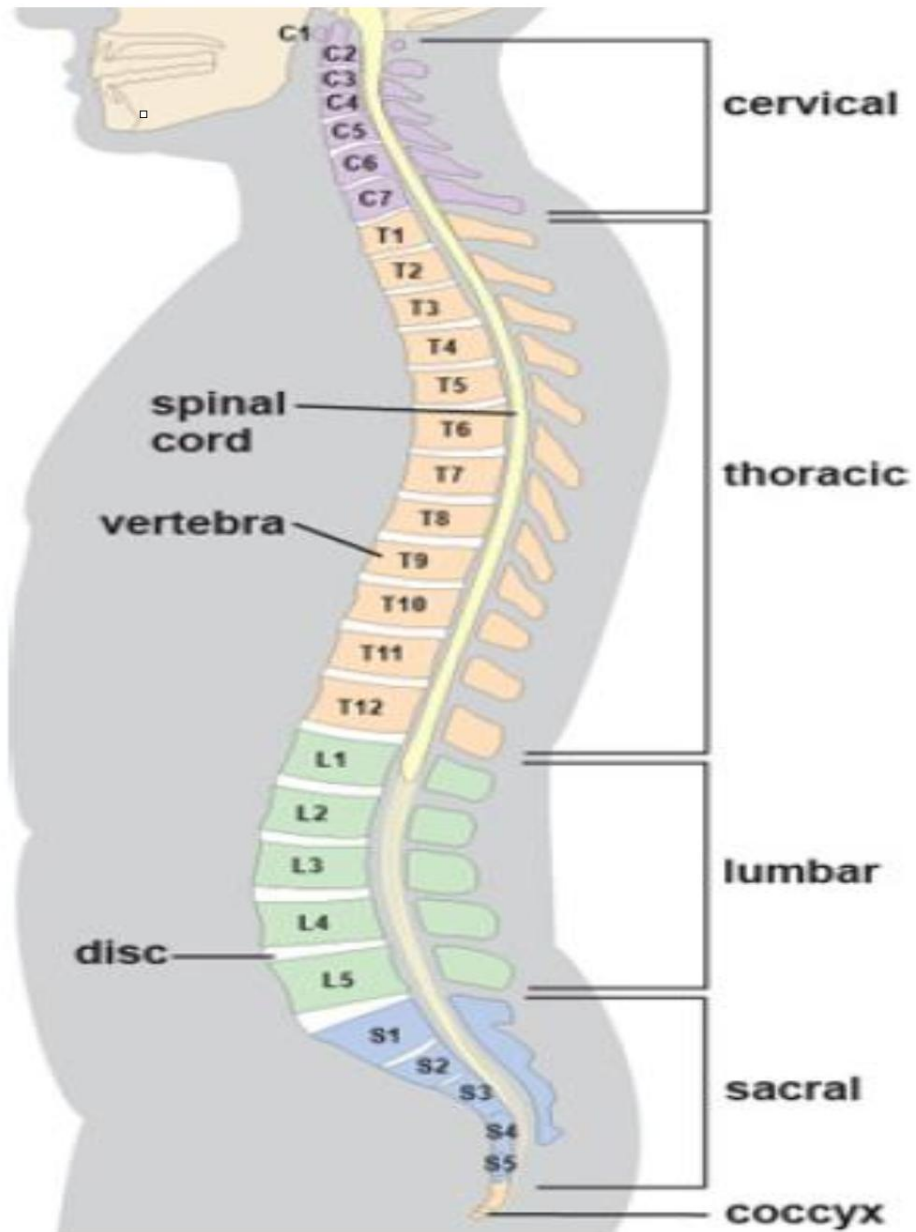


# Posture correction

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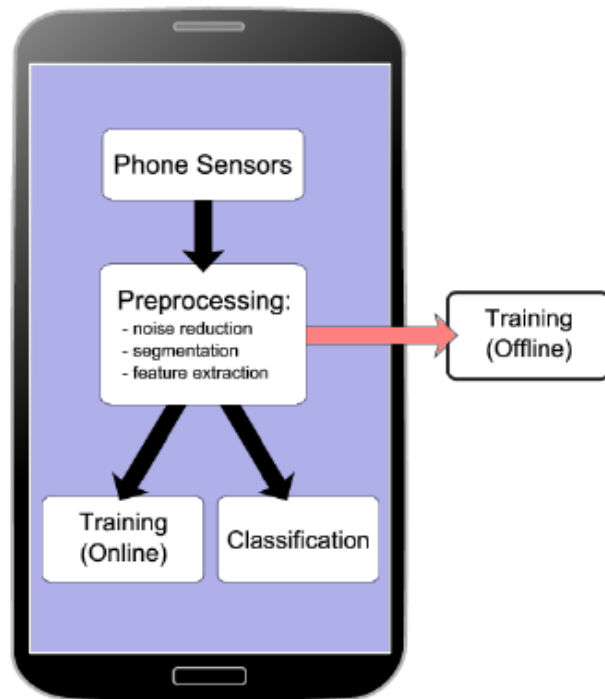
How can you improve this app?  
What all this could be used for?



The LUMO app tracks and scores your posture, with a stick figure. It compares straight versus



# Human activity recognition



doi:10.3390/s150102059



[MATLAB video tutorial](#)

[Data source](#)

# Innovating for Billions

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Prof Ramesh Raskar, Faculty, MIT Media Lab  
(Idea Hexagon, Kumbathon)

More than 70% of the world's population has a smart-phone, and there are more mobile subscriptions than people in the world. [🔗](#)

# Basic elements of programming language

---

Programming Environment

---

Data Types, Variables, Keywords

---

Input and Output Operations

---

Logical and Arithmetical Operators

---

If else conditions, Loops

---

Functions

---

Comments, Indentation, Bottom up debugging

# Assignment 2: App Building (Marks: 20)

Expected time to finish this exercise: 12 hours

Build a functional App. Please share the thought process behind why is this App needed (2.5 marks). Please share the User Interface for this App (2.5 marks). Please share the code for this App (apk and aia files) (7.5 marks). Have you tested this App for its functionality and/or with users (5 marks)? How can this App be improved (2.5 marks)? This is an individual assignment.

