

Verizon Innovative Learning Minority Male Program
Mobile Application Development
Syllabus
Summer 2017
1st Session (June 5 - June 16, 2017)
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Course Description: Students will learn the MIT App Inventor (<http://appinventor.mit.edu/explore/>), a cloud-based tool, to design and build their own applications for Android-OS phones and tablets. MIT App Inventor utilizes a blocks-based programming approach and a drag and drop environment which makes it an easy to use tool. The two-week course will include eight lessons, four each week, and each lesson will be one and half hours. Students will learn basics of Android apps programming with the MIT App Inventor in the first five lessons. Students will develop an idea and design the interface of the their application in Lesson 6. Students will use block programming to add functionality to their application and test it in Lesson 7. Students will prepare for presenting their application in Lesson 8. The student final presentation will be given after finishing the eight lessons. While learning Android programming basics, students will get to know the mobile app development tool: MIT App Inventor, the various components of mobile apps, and the design and implementation of mobile apps. While developing their applications, students will be introduced to the united nation's sustainable development goals (SDG) to transform our world and the software development process to convert an idea into a design and to make that design come alive. Their critical thinking and analytical reasoning skills will be strengthened as they go through this process. In addition, students will become confident that they can develop wonderful mobile apps to help their family, school, and community and eventually to transform the world.

Course Objectives:

Upon completion of this course, a student will be able to:

1. Understand the role of computing in solving problems
2. Navigate the MIT App Inventor user interface
3. Understand and use MIT App Inventor to create mobile apps
4. Function effectively on teams to design and build a mobile app
5. Create good ideas to help their family, school, and community

Lesson Plans

See next pages

Lesson Plans

Lesson 1	Getting Started with MIT App Inventor
Monday June 5	<p>Overview: App Inventor is a cloud-based tool, which means that you can build apps right in your web browser. This lesson will provide the setup instructions for Android devices, simple example apps with video to start building your own apps, as well as sharing and packing your apps.</p> <p>Learning Outcomes: Upon completion of this lesson, students will be able to</p> <ol style="list-style-type: none">1. Log into App Inventor with their Google email account2. Setup their Android phones/tablets for live testing3. Be familiar with the App Inventor environment: Designer and Blocks Editor4. Share and Packaging Apps <p>Requirements:</p> <ol style="list-style-type: none">1. Know how to use computer keyboard and mouse2. Know how to use web browser3. Attend the course on time4. Pay attention to the course <p>Evaluation:</p> <ol style="list-style-type: none">1. Make the first app with using MIT APP Inventor according to the videos and it works properly on an Android device.2. Write app components and their functions you have learned from this course. <p>Reference Materials:</p> <ol style="list-style-type: none">1. Setup Instructions: How to set up your phone for live testing (or, if you don't have a phone, how to start the emulator). http://appinventor.mit.edu/explore/ai2/setup.html2. Designer and Blocks Editor Overview: Gives a tour of the App Inventor environment. http://appinventor.mit.edu/explore/designer-blocks.html3. Beginner Video Tutorials: With these beginner-friendly tutorials: Talk to me, Ball Bounce, and Digital Doodle, you will learn the basics of programming apps for Android. http://appinventor.mit.edu/explore/ai2/beginner-videos.html4. Packaging and Sharing Apps: After you have built an app, you can package it for your phone and you can share it with friends. http://appinventor.mit.edu/explore/ai2/share.html <p>Apps and Components studied from the videos in this lesson:</p> <ol style="list-style-type: none">1. Talk to me (Part 1 and Part 2): This is a talking app. This app will use the components: Button, Text To Speech, Text Box, Accelerometer Sensor2. Ball bounce: In this app, you can make a Ball (a sprite) bounce around on the screen (on a Canvas). This app will use the components: Canvas, Ball, Text Box3. Digital Doodle: This app allows you to draw a line on the screen as you drag a finger around. This app will use the component: Canvas

Lesson 2	Basic Tutorials: Hello Purr and Mole Mash
Tuesday June 6	<p>Overview: This lesson will teach two basic apps: Hello Purr and Mole Mash, and continue to emphasize the concepts of Mobile App programming with App Inventor introduced in Lesson 1. In addition, students will learn several concepts in computer science such as variable, procedure, branch, and random number.</p> <p>Learning Outcomes: Upon completion of this lesson, students will be able to</p> <ol style="list-style-type: none"> 1. Create a new App Inventor project 2. Use the App Inventor Designer and Blocks Editor 3. Download images and sounds and incorporate them into apps 4. Know the computer science concepts of variable, procedure, branch, and random number and use them in their apps <p>Requirements:</p> <ol style="list-style-type: none"> 1. Completed the previous lessons 2. Attend the course on time 3. Pay attention to the course <p>Evaluation:</p> <ol style="list-style-type: none"> 1. Complete the Hello Purr and Mole Mash apps and they work properly on an Android device. 2. Write app components and their functions you have learned from this course. 3. Write why we need to use variables and procedures in a software program. 4. Give an example of conditional execution (branch). <p>Apps and Components studied in this lesson:</p> <ol style="list-style-type: none"> 1. Hello Purr: This simple exercise takes you through the very basics of App Inventor. In a very short time you will create a button that has a picture of a cat on it, and then program the button so that when it is clicked a "meow" sound plays. This app will use the components: Button, Label, Sound Need to download kitty.png and meow.mp3 2. Mole Mash: In the arcade game Whac-a-Mole TM , a "mole" pops up at random positions on a playing field, and the user score points by hitting the mole with a mallet. This is a similar game that uses the touch screen. This tutorial introduces variables and procedures, and the app will use the following components: Canvas, Image Sprite, Button, Label, Sound, Text To Speech, Timer and Clock need to download mole.png <p>Reference Materials:</p> <ol style="list-style-type: none"> 1. Hello Purr 2. Mole Mash

Lesson 3	To Do List / TinyDB
<p>Wednesday June 7</p>	<p>Overview: In this lesson, we are going learn how to work with the TinyDB. TinyDB means "Tiny Data Base." A data base stores information made by the app so it can access it even after the app has been closed and reopened. We are going to make a simple To Do List app. In this lesson, the text manipulation, the list data structure, and the nested branch are introduced.</p> <p>Learning Outcomes: Upon completion of this lesson, students will be able to</p> <ol style="list-style-type: none"> 1. Use layout components to arrange appearance of an app 2. Use the Notifier component to display messages and to get user's responses 3. Use the TinyDB component to save data into a persistent database and to initialize the app with data stored in database before. 4. Understand the computer data storage and list data structure <p>Requirements:</p> <ol style="list-style-type: none"> 1. Completed the previous lessons 2. Attend the course on time 3. Pay attention to the course <p>Evaluation:</p> <ol style="list-style-type: none"> 1. Complete the To Do List app and it works properly on an Android device. 2. Write new app components and their functions you have learned from this course. 3. Write text manipulation operations you have learned from this course. 4. Write the definition of a list data type. <p>New app components studied in this lesson:</p> <ul style="list-style-type: none"> • ListPicker – A button that, when clicked on, displays a list of texts for the user to choose • Layouts – Arranging appearance (or layout) of other visible components of an app • Notifier – Displaying messages and/or getting responses • TinyDB – Saving data into a persistent database <p>Reference Materials: To Do List</p>

Lesson 4	Map IT / Displaying Locations on a Google Map
Thursday June 8	<p>Overview: This lesson shows how you can develop an app that allows you to enter and record an address and view the address on the Google Maps. It will also show you how view your current location on the Google Map. In addition to variable, procedure, and branch, this lesson introduces data storage.</p> <p>Learning Outcomes: Upon completion of this lesson, students will be able to</p> <ol style="list-style-type: none">1. Use layout components to arrange appearance of an app2. Use the LocationSensor component to detect the current location3. Use the ActivityStarter component to open the map application to a specified location4. Use the TinyDB component to save data into a persistent database and to initialize the app with data stored in database before <p>Requirements:</p> <ol style="list-style-type: none">1. Completed the previous lessons2. Attend the course on time3. Pay attention to the course <p>Evaluation:</p> <ol style="list-style-type: none">1. Complete the Map It app and it works properly on an Android device.2. Write non-visible app components and their functions you have learned from this course.3. Write why we need to store information (data) in database. <p>Non-visible app components studied in this lesson:</p> <ul style="list-style-type: none">• LocationSensor – Detecting current location for displaying on Google Maps• ActivityStarter – used to start-up Google Maps for current or predefined address• Notifier – Displaying messages and/or getting responses• TinyDB – Saving data into a persistent database <p>Reference Materials: Map It</p>

Lesson 5	Music Player / Working with Screens
Friday June 9	<p>Overview: In this lesson, we are going to learn about working with multiple screens. We are going to make an simple music player app. In this app, text manipulation skill and opening and closing a screen are the focus. Simple math operations to increase or decrease a quantity are also introduced.</p> <p>Learning Outcomes: Upon completion of this lesson, students will be able to</p> <ol style="list-style-type: none"> 1. Use layout components to arrange appearance of an app 2. Use multiple screens to switch among different tasks 3. Use the TinyDB component to save data into a persistent database and to initialize the app with data stored in database before <p>Requirements:</p> <ol style="list-style-type: none"> 1. Competed the previous lessons 2. Attend the course on time 3. Pay attention to the course <p>Evaluation:</p> <ol style="list-style-type: none"> 1. Complete the Music Play app and it works properly on an Android device. 2. Write new app components and their functions you have learned from this course. 3. Draw blocks to open a new screen called "Artists" when a button called "New" is clicked. <p>Non-visible app components studied in this lesson:</p> <ul style="list-style-type: none"> • Player – Playing audio and controlling phone vibration • TinyDB – Saving data into a persistent database <p>Need to download the following files of pictures and songs.</p> <ul style="list-style-type: none"> ▪ justinbieber.jpg ▪ justinbieber.mp3 ▪ ladygaga.jpg ▪ ladygaga.mp3 <p>Reference Materials: Music Player</p>

Lesson 6	Sustainable Development Goals and Ideas to Achieve Them
Monday June 12	<p>Overview: In this lesson, the united nation's sustainable development goals (SDG) to transform our world will be introduced. Students will be divided as groups. Each group will brainstorm on ideas of a socially useful mobile app to achieve SDG, and then design an app interface and define the function of each interface components.</p> <p>Learning Outcomes: Upon completion of this lesson, students will be able to</p> <ol style="list-style-type: none">1. Know the united nation's sustainable development goals (SDG) and get an idea of their own app for helping their family, school, community, etc.2. Know the general software design approach to convert a good idea into app design with functional app components. <p>Requirements:</p> <ol style="list-style-type: none">1. Attend the course on time2. Pay attention to the course <p>Evaluation:</p> <ol style="list-style-type: none">1. Write an overview of their app idea.2. Draw the layout (look) of the app3. List all app components. <p>Reference Materials: Sustainable Development Goals</p>

Lesson 7	Implementation and Testing Apps
Tuesday June 13	<p>Overview: In this lesson, students will select the App Inventor blocks and implement the app and testing the app. It is very likely that students may need to go back to their app design and make a change in order to have a working app or a better app. During this process, student mentors are expected to provide assistance to students.</p> <p>Learning Outcomes: Upon completion of this lesson, students will be able to</p> <ol style="list-style-type: none"> 1. Use App Inventor to make a working app designed in Lesson 6. <p>Requirements:</p> <ol style="list-style-type: none"> 1. Competed the previous lessons 2. Attend the course on time 3. Pay attention to the course <p>Evaluation: Their app should work properly on an Android device</p>
Lesson 8	Preparation for Presentation
Wednesday June 14	<p>Overview: In this lesson, students will polish their app and prepare for presenting it. The presentation should include the purpose and function of the app, the usage, the components, the component blocks applied, the contributions of each team member, and etc. It is highly expected that each team will be able to demonstrate how their app works.</p> <p>Requirements:</p> <ol style="list-style-type: none"> 1. Competed the previous lessons 2. Attend the course on time and consistently 3. Pay attention to the course <p>Evaluation: Student teams will evaluate their presentations each other.</p>