Emostel Academy
Scratch Programming for Kids
CODE
EMOSTEL ACADEMY

SCRATCH PROGRAMMING FOR KIDS AGES 8+ (BEGINNER TO ADVANCED)

A Comprehensive Curriculum

COURSE OVERVIEW

This course introduces children to the basics of coding using Scratch, a block-based programming language developed by MIT. Students will learn to create interactive stories, games, and animations. The course is designed to be fun and engaging, encouraging creativity while teaching foundational programming concepts.

Emostel Academy
Break Into Tech: iCode For Children
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Course Details

ABOUT THIS COURSE

Scratch is designed to be an introductory programming language for children, and its visual, block-based interface makes it accessible and engaging for young learners. Unlock your child's creativity and problem-solving skills with Scratch programming! Designed by the MIT Media Lab, Scratch is an engaging and intuitive platform allowing children to create interactive stories, games, and animations. Through a simple drag-and-drop interface, children can learn the fundamentals of coding while having fun and expressing their imagination. Register your child or children for this program to discover how Scratch can spark a lifelong love of learning and technology while they get empowered with the tools to become confident and innovative thinkers!

Here are a few key points about learning Scratch:

- **User-Friendly Interface:** Scratch uses a drag-and-drop interface, allowing children to create programs without worrying about syntax errors, which is ideal for younger learners.
- **Educational Focus:** Scratch was developed by the MIT Media Lab to teach children the fundamentals of programming in a fun and interactive way.
- **Children Focused:** While 8 is a common starting age, younger children may also enjoy Scratch with adult assistance or in a guided setting, such as a classroom or workshop.

COURSE OBJECTIVES

By the end of this course, students will:

1. **Understand the basics of programming** using Scratch's block-based coding environment.
2. **Create interactive stories, animations, and games** by applying learned concepts.
3. **Design interactive educational tools** that can teach concepts in subjects like math, science, or language arts.

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4. **Develop computational thinking and problem-solving skills** through coding exercises and projects. They will be able to break down complex problems into smaller, manageable tasks that can be coded.
5. **Create simulations that mimic real-world systems** such as weather patterns, traffic lights, or virtual pets.
6. **Gain familiarity with coding structures**, such as loops, conditionals, variables, and custom blocks.
7. **Collaborate with peers** on projects to enhance teamwork and coding collaboration skills.
8. **Build confidence in coding** and be prepared to explore more advanced programming languages.
9. **Embrace and Advance in Math knowledge and application** with our mathematics clinic sessions added to the program.
10. **Gain substantial leadership, team, and general soft skills needed in every-day life**, at school, at home, and various works.

TARGET AUDIENCE

- **Age Group:** 8 years and above
- **Prerequisites:** No prior programming experience is required. A willingness to learn and explore is all you need

SUPPORT AND COMMUNITY:

1. **Live Sessions:** Interactive classes twice a week where students can ask questions and engage directly with instructors.

2. **Pre-recorded Videos:** Comprehensive weekly lessons that students can watch at their own pace.

3. **Community Forum:** An online platform where students can interact, share ideas, collaborate on projects, and help each other solve problems.

4. **Tutor Support:**
    - **Office Hours:** Dedicated time slots where tutors are available for one-on-one assistance.

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- **Email Support:** Students can reach out to instructors for help and clarification.
- **Feedback:** Regular constructive feedback on assignments and projects to aid improvement.

5. **Parental Updates:** Periodic reports on student progress to keep parents informed and engaged.

COURSE DURATION:

- **Total Duration:** 3 months for course coverage, 3 months for projects and mastery
- **Class Frequency:** 2 live sessions per week | Pre-recorded sessions released every week. (Live sessions are also recorded and sent to student portal for reference).
- **Class Duration:** 1.5 hours per live session

LEARNING RESOURCES:

- **Materials:** Course notes, coding exercises, project templates
- **Supplementary Resources:** Video tutorials, coding challenges, and reference guides

ASSESSMENTS:

- **In-Class Projects:** Weekly coding challenges and mini-projects.
- **Final Project:** Students will develop and present a final project, such as a text-based adventure game, a drawing app, or a simple calculator with a history feature.
- **Quizzes:** Periodic quizzes to assess understanding of key concepts.

CERTIFICATION:

Participants who successfully complete the Scratch Programming course will be awarded a certificate of achievement. This certificate formally recognizes the skills and knowledge acquired in Scratch programming, demonstrating the participant's capability to craft interactive stories, games, and animations. To earn this certificate, one must complete all course modules and tasks, achieve the passing mark on quizzes, and submit an end-of-course project that passes assessment and approval.

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COURSE FEE:

~~₦~~100,000 (one-off payment) or ~~₦~~40,000 (paid monthly)

ENROLMENT INFORMATION:

- **Registration Deadline:** September 1, 2024
- **Course Start Date:** September 2, 2024

PROGRAM FEATURES:

- **Hands-On Learning:** We focus on interactive sessions where students design in real-time.
- **Project-Based Approach:** We reinforce concepts with small projects after each lesson and a final project at the end.
- **Gamification:** We introduce design challenges, quizzes, and fun competitions to keep students engaged.
- **Visual Aids and Examples:** We use diagrams, flowcharts, and live coding demonstrations to explain complex topics.
- **Peer Learning:** We encourage students to work together on exercises and projects to foster collaboration.
- **Regular Assessments:** We conduct short quizzes and design exercises to assess understanding and provide feedback.
- **Community Support:** Learners are added to communities pertaining to their course, so that they can interact with other learners to work together on projects, share ideas, express their challenges to get resolution, and get support from our expert tutors and community managers.
- **Direct Tutor Support:** Learners can also get support directly from the course tutor in cases where the tutor's attention is specially needed or on matters that may not be community resolvable.

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- **Mathematics Clinic:** We clearly understand how math relates to coding and how it greatly impacts the Intelligence Quotient (IQ) of students and therefore deemed it necessary to introduce it into our programs. We also offer to (ethically) aid students with their homework challenges especially in math.

- **Soft Skills:** As an additional extracurricular activity, we prioritize training students in essential soft skills, with a strong focus on leadership. This extends to other crucial abilities such as teamwork, collaboration, communication, etc. Not only does this enrich their learning experience, but it also helps them stand out in exceptional and admirable ways, preparing them for remarkable future success.

- **Guest Speakers:** Periodic sessions with industry professionals to inspire and provide real-world insights.

- **Flexible Learning:** Content is accessible anytime, allowing students to learn at their own pace alongside structured live sessions.

- **Future Pathways:** Guidance on continuing education in technology fields and exploration of potential career paths in web development and design.

- **Parental Engagement:** Opportunities for parents to participate in certain sessions and view student progress, fostering a supportive learning environment at home.

To participate in the Scratch Programming course for children aged 8 and above, the following technical requirements are necessary:

TECHNICAL REQUIREMENTS

Device Requirements:

1. Computer/Laptop:

- **Operating System:** Windows 10 or higher, macOS 10.13 (High Sierra) or higher, or any recent Linux distribution.
- **Processor:** Intel Core i3 or equivalent.
- **Memory (RAM):** 4 GB minimum (8 GB recommended).
- **Storage:** At least 10 GB of free disk space.
- **Display:** 13-inch screen with a resolution of 1366 x 768 pixels or higher.

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- **Internet Connectivity:** Reliable broadband connection for downloading resources and attending live sessions.

2. Tablet (Alternative):

Operating System: iOS 12 or higher, Android 8.0 or higher.

Screen Size: 10 inches or higher for better readability.

Storage: 32 GB minimum.

Software Requirements:

1. No installations required. Scratch can be accessed and run online via scratch.mit.edu

The process is explained in the live class and a pre-recorded video dedicated to this.

2. Scratch Desktop Software Installation (Optional)

Regardless of your device type, scratch programming environment can be accessed online through your browser. However, if you are interested in running a desktop version (for offline use), you may install the desktop app. This process is also explained in the pre-recorded video and will be demonstrated in the first live session also.

Optional Hardware:

- **External Mouse:** Recommended for easier navigation and coding, especially for younger students.
- **Headset with Microphone:** Useful for participating in live sessions and discussions.

Online Platforms and Tools:

1. Learning Management System (LMS): The course will be hosted on the Emostel Academy's LMS platform. Students will need a registered account to access course content, assignments, and live sessions.

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2. Video Conferencing Software:

- **Zoom/Google Meet:** For live classes, discussions, and Q&A sessions. Students should have the software installed and be familiar with joining meetings.

By ensuring the above requirements are met, participants will have a smooth and uninterrupted learning experience during the Python Programming course.

CONTACT INFORMATION:

For more information or any queries, please contact us at:

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Section 1:

Introduction to Scratch and the Programming Interface

- **Lesson 1: What is Scratch? Overview and Benefits**
  Get introduced to Scratch, a visual programming language that makes it easy to create stories, games, and animations. Learn about its benefits for creative expression and problem-solving.

- **Lesson 2: How to Install and Use Scratch**
  Learn the step-by-step process of installing Scratch on your computer or accessing it online. This lesson will guide you through the setup, ensuring you can start creating projects right away.

- **Lesson 3: Navigating the Scratch Interface**
  Explore the Scratch interface, including the stage, blocks palette, and script area. Learn how to find and use the tools available to build your projects.

- **Lesson 4: Understanding the Stage and Sprites**
  Delve into the concept of the stage, where your projects come to life, and sprites, which are the characters and objects in your projects. Understand how they interact within Scratch.

TASK:

Create a simple project that uses at least two different sprites. Ensure that each sprite has some basic movement or interaction. Write a short description explaining what the project does.

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Section 2:

Creating and Customizing Sprites

- **Lesson 1: Introduction to Sprites**
  Learn about sprites, the characters, and objects in Scratch. Understand their role and how to select and manage them within your projects.

- **Lesson 2: Creating New Sprites**
  Discover how to create your own sprites from scratch or use Scratch's library of pre-made sprites. Start bringing your ideas to life with custom designs.

- **Lesson 3: Customizing Sprites with Costumes**
  Explore how to customize sprites by changing their costumes. Learn to edit and switch between different looks to add variety and personality to your projects

TASK:

Design your own sprite using the Scratch editor. Create at least three different costumes for the sprite and animate it using the "next costume" block.

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Section 3:

Motion and Movement Blocks

- **Lesson 1: Basic Motion Blocks (move, turn, go to)**
  Get hands-on with the basic motion blocks in Scratch, learning how to make sprites move, turn, and go to specific locations on the stage.

- **Lesson 2: Using the Glide Block**
  Learn how to use the glide block to create smooth, flowing movements for your sprites. Understand how timing and coordinates work together for fluid animations.

- **Lesson 3: Coordinating Movements with XY Coordinates**
  Dive deeper into controlling sprite movements by using the XY coordinate system. Learn how to precisely position and navigate sprites on the stage

TASK:

Build a simple animation where a sprite moves across the stage and back, using different motion blocks (e.g., move, glide). Incorporate a backdrop to enhance the scene.

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Section 4:

Looks and Appearance Blocks

- **Lesson 1: Changing Colors and Sizes**
  Explore how to change the appearance of sprites by adjusting their colors and sizes. Learn to use these effects creatively in your projects.

- **Lesson 2: Switching Costumes**
  Master the use of costume switches to create dynamic animations and effects. Learn to coordinate costume changes with actions for more engaging projects.

- **Lesson 3: Using Show and Hide Blocks**
  Learn how to control the visibility of sprites using the show and hide blocks. Understand how to make elements appear and disappear at the right moments

TASK:

Create a project where a sprite changes its color and size when a key is pressed. The sprite should also switch costumes at least once.

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Section 5:

Sound and Music Blocks

- **Lesson 1: Adding Sounds to Sprites**
  Discover how to enhance your projects by adding sounds to sprites. Learn to choose, upload, and attach sounds to different events in your animations and games.

- **Lesson 2: Playing Music and Sound Effects**
  Learn how to incorporate music and sound effects into your projects. Understand the timing and looping of sounds to match the flow of your project.

- **Lesson 3: Controlling Volume and Tempo**
  Gain control over the volume and tempo of sounds in your projects. Learn to adjust these settings dynamically for greater impact and immersion.

TASK:

Develop a short musical animation. Add sounds or music that play when a sprite moves or changes appearance. Include at least one sound effect triggered by an event.

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Section 6:

Events and Broadcasting Messages

- **Lesson 1: Understanding Event Blocks**
  Dive into event blocks, the triggers that start actions in Scratch. Learn about different events like clicks and key presses that make your projects interactive.

- **Lesson 2: Using When Green Flag Clicked and When Key Pressed**
  Master the use of the "when green flag clicked" and "when key pressed" blocks to control when actions start in your projects.

- **Lesson 3: Broadcasting and Receiving Messages**
  Explore how to broadcast and receive messages between sprites to coordinate complex actions and interactions within your projects

TASK:

Create an interactive project where pressing different keys triggers different actions (e.g., playing a sound, changing a backdrop). Use broadcasting to make multiple sprites interact with each other.

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Section 7:

Using Control Blocks

(Loops and Conditionals)

- **Lesson 1: Introduction to Loops (repeat, forever)**
  Understand the concept of loops, which allow actions to repeat. Learn how to use repeat and forever loops to create ongoing actions in your projects.

- **Lesson 2: Using Conditional Statements (if, if else)**
  Learn how to use conditional statements to make decisions in your code. Understand how "if" and "if else" blocks work to create interactive and responsive projects.

- **Lesson 3: Combining Loops and Conditionals**
  Combine loops and conditionals to create more complex behaviours and interactions in your projects. Learn to control the flow of actions based on conditions

TASK:

Design a small game or animation that uses loops to repeat an action and conditional statements to create different outcomes based on user input or sprite interactions.

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Section 8:

Sensing and User Interaction

- **Lesson 1: Sensing Mouse Position and Clicks**
  Explore how to make your projects interactive by sensing mouse movements and clicks. Learn to respond to user inputs effectively.

- **Lesson 2: Detecting Collisions with Touching Blocks**
  Learn to use touching blocks to detect when sprites interact with each other or the edges of the stage. Use this to create collision-based effects and interactions.

- **Lesson 3: Using Ask and Answer Blocks for Input**
  Discover how to use ask and answer blocks to gather input from users. Learn to incorporate user responses into your projects for personalized experiences

TASK:

Create a simple game where the sprite responds to mouse clicks or key presses. Use sensing blocks to detect the position of the mouse or if a sprite is touching another object.

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Section 9:

Variables and Lists

- **Lesson 1: Creating and Using Variables**
  Understand the concept of variables in Scratch. Learn how to create and use variables to store and manipulate data in your projects.

- **Lesson 2: Storing Data in Lists**
  Explore how to use lists to store and manage collections of data. Learn to create, access, and modify lists to handle more complex information in your projects.

- **Lesson 3: Manipulating Variables and Lists**
  Learn advanced techniques for working with variables and lists, including how to update, compare, and use them dynamically in your projects

TASK:

Develop a project that uses variables to keep track of scores or other information. Include a list that stores multiple pieces of data (e.g., a list of player names or items collected in a game).

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Section 10:

Simple Animation Techniques

- **Lesson 1: Basic Frame-by-Frame Animation**
  Get started with basic frame-by-frame animation techniques. Learn how to create the illusion of movement by changing costumes over time.

- **Lesson 2: Using the Wait Block for Timing**
  Learn how to use the wait block to control the timing of animations and actions in your projects. Understand the importance of timing in creating smooth animations.

- **Lesson 3: Creating Looping Animations**
  Explore how to create looping animations that repeat continuously. Learn to use loops and timing blocks together for seamless animations.

TASK:

Create a frame-by-frame animation of a sprite walking, jumping, or performing a similar action. Use the wait block to control the timing of the animation.

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Section 11:

Building a Basic Interactive Story

- **Lesson 1: Storyboarding Your Story**
  Begin the process of creating an interactive story by storyboarding your ideas. Learn how to plan the flow, characters, and interactions for your story.

- **Lesson 2: Adding Characters and Dialogue**
  Learn how to add characters and dialogue to your story. Understand how to use speech bubbles and timing to create engaging interactions between characters.

- **Lesson 3: Creating Interactions and Choices**
  Explore how to create interactive elements and choices in your story. Learn to use conditionals and broadcasting to make your story dynamic and engaging.

TASK:

Write and storyboard a short interactive story. Use dialogue and character interactions to guide the player through the story, with at least one decision point where the player can choose what happens next.

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Section 12:

Creating a Simple Game

(Maze Game)

- **Lesson 1: Designing the Maze Layout**
  Start designing your maze game by creating the layout. Learn how to plan the structure, paths, and challenges for your players.

- **Lesson 2: Coding Player Movement**
  Learn how to code player movement using arrow keys or other controls. Understand how to make your player sprite navigate through the maze.

- **Lesson 3: Adding Obstacles and Goals**
  Add obstacles and goals to your maze game to increase the challenge. Learn how to code interactions that determine success or failure in the game.

TASK:

Design a basic maze game where the player controls a sprite to navigate through a maze. Add obstacles and a goal to reach at the end of the maze.

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Section 13:

Using Clones for Repeated Actions

- **Lesson 1: Introduction to Cloning**
  Discover the concept of cloning in Scratch, where sprites can duplicate themselves. Learn how to create and manage clones effectively.

- **Lesson 2: Creating and Managing Clones**
  Learn how to create clones during gameplay and manage their behavior. Understand how to use clones to perform repeated actions or create multiple instances of sprites.

- **Lesson 3: Using Clones in Games and Animations**
  Explore how to use clones in games and animations to create complex effects. Learn to control and interact with multiple clones simultaneously.

TASK:

Create a game or animation that uses clones to replicate a sprite multiple times. For example, create a shooting game where a sprite shoots clones, or an animation where clones move in a pattern.

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Section 14:

Adding Score and Game Metrics

- **Lesson 1: Setting Up a Scoring System**
  Learn how to set up a scoring system in your games. Understand how to create variables that track scores and display them on the screen.

- **Lesson 2: Incrementing Scores and Lives**
  Discover how to increment scores and manage player lives in your game. Learn to adjust these elements based on player actions and outcomes.

- **Lesson 3: Creating Win and Lose Conditions**
  Explore how to set up win and lose conditions in your game. Learn to create rules that determine when the game ends and how to provide feedback to players.

TASK:

Enhance the game or project you created in a previous session by adding a scoring system. Create conditions for winning or losing, such as reaching a certain score or losing all lives.

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Section 15:

Introduction to Functions (My Blocks)

- **Lesson 1: Understanding Functions**
  Get introduced to functions in Scratch, known as My Blocks. Learn how functions can simplify your code by grouping actions into reusable blocks.

- **Lesson 2: Creating Custom Blocks**
  Learn how to create your own custom blocks (functions) in Scratch. Understand how to define actions that can be reused throughout your project.

- **Lesson 3: Using Functions to Simplify Code**
  Explore how to use functions to organize and simplify your code. Learn how breaking down complex tasks into smaller functions can make your projects easier to manage.

TASK:

Create a custom block (function) that simplifies a repetitive task in your project. For example, create a block that moves a sprite in a specific pattern or triggers a complex animation sequence.

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Section 16:

Advanced Animation and Costumes

- **Lesson 1: Smooth Transitions and Movements**
  Learn how to create smooth transitions and movements for your sprites. Understand techniques to make your animations appear more fluid and natural.

- **Lesson 2: Complex Costume Changes**
  Dive into more advanced costume changes, allowing for detailed animations and character expressions. Learn to coordinate multiple costumes for more dynamic effects.

- **Lesson 3: Syncing Animations with Sounds**
  Explore how to synchronize animations with sound effects and music, enhancing the overall experience of your projects. Learn timing techniques to make your animations and sounds work together seamlessly.

TASK:

Design an advanced animation that incorporates smooth transitions and complex costume changes. Synchronize the animation with a sound or music track to create a polished final project.

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Section 17:

Creating a Quiz Game

- **Lesson 1: Designing Quiz Questions**
  Learn how to design engaging and challenging quiz questions. Understand how to structure questions for different types of quizzes, including multiple-choice and true/false.
- **Lesson 2: Implementing Question Logic**
  Explore how to code the logic behind quiz questions, including tracking correct answers and providing immediate feedback. Learn to create a functional and interactive quiz system.
- **Lesson 3: Scoring and Providing Feedback**
  Discover how to implement a scoring system for your quiz game and provide players with feedback on their performance. Learn to display scores and create custom messages based on quiz results.

TASK:

Develop a quiz game with at least five questions. Implement logic to track correct answers, provide feedback for each question, and display a final score at the end.

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Section 18:

Using Pen Blocks for Drawing

- **Lesson 1: Introduction to Pen Blocks**
  Get introduced to the pen blocks in Scratch, which allow you to draw directly on the stage. Learn the basics of using these blocks to create simple drawings.

- **Lesson 2: Drawing Shapes and Patterns**
  Learn how to use pen blocks to draw various shapes and patterns. Explore different techniques for creating intricate designs and repeating patterns.

- **Lesson 3: Creating Interactive Drawing Tools**
  Explore how to create interactive drawing tools, like digital paintbrushes, using pen blocks. Learn to add user controls for a more engaging drawing experience

TASK:

Create a drawing project where the user can draw shapes or patterns on the stage using pen blocks. Add controls that allow the user to change colors, shapes, or line thickness.

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Section 19:

Simulating Real-World Problems

- **Lesson 1: Modelling Physical Systems (e.g., Gravity)**
  Learn how to model physical systems, such as gravity, using Scratch. Explore how to simulate real-world physics in your projects for a more realistic effect.

- **Lesson 2: Creating Simulations (e.g., Traffic Lights)**
  Discover how to create simulations of real-world systems, such as traffic lights or weather patterns. Learn to use logic and control blocks to accurately represent these systems.

- **Lesson 3: Adding Interactivity to Simulations**
  Explore how to add interactivity to your simulations, allowing users to engage with and influence the system. Learn to incorporate user input and feedback into your models.

TASK:

Create a simulation of a real-world system, such as a bouncing ball that follows the laws of gravity or a simple traffic light system that changes colors based on a timer.

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Section 20:

Debugging and Troubleshooting

- **Lesson 1: Common Scratch Errors and Fixes**
  Learn about common errors that can occur in Scratch and how to fix them. Understand the typical issues you might encounter and how to troubleshoot them effectively.

- **Lesson 2: Debugging Techniques**
  Explore various debugging techniques to identify and resolve problems in your Scratch projects. Learn to use Scratch's built-in tools to find and correct errors.

- **Lesson 3: Testing and Iterating Projects**
  Discover the importance of testing and iterating your projects. Learn how to test your code, gather feedback, and make improvements to ensure your project works as intended

TASK:

Take one of your previous projects and intentionally introduce a few errors. Then, debug and fix the errors, documenting your process and explaining how you identified and resolved each issue.

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Section 21:

Sharing and Presenting Projects

- **Lesson 1: Preparing Projects for Sharing**
  Learn how to prepare your Scratch projects for sharing with others. Explore how to package your projects, add descriptions, and ensure they are ready for presentation.

- **Lesson 2: Using the Scratch Community**
  Discover how to share your projects within the Scratch community. Learn how to upload your projects, interact with other Scratch users, and receive feedback from peers.

- **Lesson 3: Presenting Projects to Peers**
  Explore how to present your Scratch projects to others, whether in a classroom setting or online. Learn techniques for effective presentation and how to showcase your work confidently.

TASK:

Prepare one of your projects for sharing. Write a detailed description, add instructions on how to use the project, and present it to your peers or upload it to the Scratch community.

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Section 22:

General Project: Interactive Story or Game

- **Lesson 1: Planning the Final Project**
  Start planning your final project, whether it's an interactive story or game. Learn how to outline your project's goals, structure, and key features.

- **Lesson 2: Developing and Refining the Project**
  Work on developing your final project, refining it through iterative design and testing. Learn how to troubleshoot issues, polish your work, and ensure it meets your vision.

- **Lesson 3: Showcasing and Receiving Feedback**
  Present your final project to an audience, showcasing your skills and creativity. Learn how to receive and incorporate feedback to further improve your work.

TASK:

Plan and develop a final project that combines elements from the entire course. This could be an interactive story, game, or simulation. Focus on refining the project through testing and feedback and prepare to showcase it to your class or community.

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Section 10:

Final Projects and Review

END OF COURSE PROJECTS:

These projects offer a range of creative and technical challenges, enabling participants to select tasks that match their interests while utilizing the skills they've acquired during the course. They are crafted to be both enjoyable and educational. Completing these projects will give students a sense of achievement.

1. **Animated Short Film**
   Create a short, animated film with characters, dialogues, and scenes. Participants can focus on storytelling, character development, and animation techniques.

   Applicable Skills:
   - **Storytelling and Narrative Development:** Crafting a coherent story with a beginning, middle, and end.
   - **Character Animation:** Creating and animating characters using motion and looks blocks.
   - **Dialogue and Text Display:** Using speech bubbles and text blocks to present dialogue.
   - **Scene Transitions:** Switching backgrounds and scenes smoothly using broadcast messages and looks blocks.
   - **Synchronization:** Timing actions and events to create a seamless animation experience.
   - **Interactive Educational Tool**

2. **Interactive Educational Tool**
   Design an educational tool that teaches a concept (like math, science, or language) using interactive elements. This project can include quizzes, drag-and-drop activities, or animated explanations.

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Applicable Skills:

- **User Interaction:** Implementing clickable buttons and interactive elements using event blocks.
- **Quiz Logic:** Using conditional statements and variables to track correct/incorrect answers.
- **Drag-and-Drop Mechanics:** Detecting collisions and using mouse position sensing for drag-and-drop activities.
- **Visual Feedback:** Changing sprites or backgrounds based on user actions, such as showing correct answers.
- **Dynamic Content:** Using variables and lists to manage and display educational content.

3. **Virtual Pet**

Code a virtual pet that players can interact with, feed, play with, and take care of. The pet could respond to different inputs and change its behavior based on how it's treated.

Applicable Skills:

- **Behavioral Programming:** Coding different behaviors for the pet based on user interaction using event and control blocks.
- **Conditional Logic:** Implementing if-else statements to change the pet's mood or status.
- **Animation and Looks:** Using costume changes and animations to visually represent the pet's emotions and actions.
- **State Management:** Tracking the pet's status (e.g., hunger, happiness) using variables.
- **Interactive Elements:** Adding buttons and controls to interact with the pet.

4. **Music and Sound Mixer**

Build a music mixer where users can combine different sounds, beats, and melodies to create their own music tracks. Participants can focus on sound blocks and interactive interfaces.

Applicable Skills:

- **Sound Blocks:** Using sound blocks to play different beats, melodies, and sound effects.
- **Timing and Loops:** Synchronizing sounds using wait blocks and repeat loops.

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- **User Interface Design:** Creating interactive buttons and sliders to control the music mixer.
- **Event Handling:** Using broadcast messages to trigger different sound combinations.
- **Creative Expression:** Experimenting with different sound combinations to create unique music tracks.

5. **Puzzle Game**

Develop a puzzle game with different levels of difficulty. This could involve solving mazes, matching patterns, or arranging pieces to complete a picture.

Applicable Skills:

- **Game Logic:** Implementing puzzle rules and mechanics using conditionals and loops.
- **Level Design:** Creating multiple levels of difficulty using different stages or costumes.
- **Collision Detection:** Using sensing blocks to detect correct/incorrect puzzle piece placement.
- **User Feedback:** Providing visual or auditory feedback for correct or incorrect moves.
- **Score Tracking:** Using variables to track progress or score as players solve puzzles.

6. **Space Adventure Game**

Create a space-themed adventure game where players navigate a spaceship through obstacles, collect power-ups, and complete missions. This project can involve more complex movement and collision detection.

Applicable Skills:

- **Advanced Movement:** Implementing complex movement mechanics like smooth gliding, rotation, and acceleration.
- **Collision Detection:** Using sensing blocks to detect collisions with obstacles, enemies, or collectibles.
- **Game State Management:** Tracking player progress, health, and collected items using variables.
- **Level Design:** Creating different stages with increasing difficulty, incorporating space themes and obstacles.

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- **Interactive Storytelling:** Using broadcast messages to advance the storyline and missions.

7. **Virtual Art Gallery**

Build a virtual art gallery where users can explore and interact with different artworks created using Scratch's drawing tools. Participants can focus on creating visually appealing animations and transitions.

Applicable Skills:

- **Drawing Tools:** Using pen blocks and the drawing editor to create custom artworks.
- **Navigation and Interaction:** Creating buttons and controls for users to navigate through the gallery.
- **Animation Techniques:** Using motion and looks blocks for smooth transitions between artworks.
- **Interactivity:** Adding interactive elements, like zooming in on artworks or displaying information.
- **Design and Layout:** Organizing the gallery with visually appealing arrangements and background changes.

8. **Choose-Your-Own-Adventure Story**

Code an interactive story where the reader makes choices that influence the outcome. This project is great for combining narrative writing with programming logic.

Applicable Skills:

- **Narrative Logic:** Using conditional statements to branch the story based on user choices.
- **Dialogue and Text Display:** Presenting story options and text using looks blocks.
- **Scene Management:** Switching backgrounds and scenes based on user choices.
- **Variable Tracking:** Using variables to track the reader's choices and influence the story outcome.
- **Interactive Elements:** Implementing clickable buttons for the reader to make choices.

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9. **Dance Party Animation**

   Create an animated dance party with different characters performing synchronized dance moves to a soundtrack. Participants can experiment with timing, choreography, and sound synchronization.

   Applicable Skills:

   - **Choreography and Timing:** Synchronizing character movements to a beat using loops and wait blocks.
   - **Sound Synchronization:** Timing dance moves to match the soundtrack using sound blocks.
   - **Character Animation:** Creating dance animations using motion and looks blocks.
   - **Event Handling:** Using broadcast messages to coordinate actions between multiple characters.
   - **Visual Effects:** Adding special effects, like lights or confetti, to enhance the dance party.

10. **Weather Simulation**

    Simulate different weather conditions like rain, snow, and thunderstorms using Scratch. The project could include changing backgrounds, sound effects, and interactive elements.

    Applicable Skills:

    - **Background Changes:** Using looks blocks to change backgrounds to represent different weather conditions.
    - **Animation Techniques:** Animating weather elements like rain, snow, and lightning using motion blocks.
    - **Sound Effects:** Using sound blocks to add realistic weather sounds like rain or thunder.
    - **Conditional Logic:** Implementing logic to change weather conditions based on user input or time.
    - **Interactive Elements:** Allowing users to select different weather conditions or simulate weather cycles.

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PLEASE NOTE:

Please note the following:

1. *As deemed necessary, the curriculum outlined above may undergo further modifications, including additions or deletions. Regardless of the situation, these changes are intended to better fulfil the objectives of the program.*
2. *The extra-curricular activities/sessions (e.g. leadership, soft skills, mathematics clinic sessions, etc.) are embedded across the learning path. Every session will be announced ahead.*
3. *These projects not only help students apply what they've learned but also allow them to express their creativity and build a portfolio of work that they can be proud of. We shall also provide the necessary project guidelines to each student and as well monitor their progress and help them with their challenges in appropriate and essential ways.*

THANK YOU FOR CHOOSING TO LEARN/TRAIN WITH US. WE ASSURE YOU OF AN AMAZING AND UNFORGETTABLE EXPERIENCE.

SEE YOU IN CLASS

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