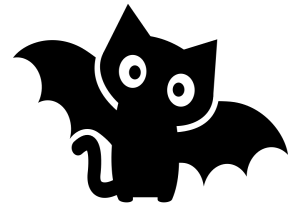


# Google Summer of Code 2021

Student Application



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## ***Awesome Demo Game Project : King Of Batona***

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### **BASIC INFORMATION:-**

- **Name** :- [\*\*AMAN GUPTA\*\*](#)
- **Email** :- aman09072000@gmail.com
- **GSoC Display Name** :- Aman Gupta
- **Github Username** :- [\*\*Aman09072000\*\*](#)

### **0.SHORT DESCRIPTION:-**

My plan is to design and develop an awesome tutorial game in catrobat visual programming language using the Luna&Cat IDE app. This game will be playable on phones as well as on smart TV when cast. The game is inspired by a hugely popular 2D game "[\*\*Hollow Knight\*\*](#)".

## 1.GSOC PROPOSAL DATA:-

I am a third-year student pursuing B.Tech in computer science engineering(specialization in **VR/AR** and **game Development**) at Sage University, Indore. An android development and game development enthusiast specializing in augmented reality and virtual reality for the next generation games. I love to create game designs, sound effects, game stories and Other game art assets.

I have completed my internships in the field of software engineering and research and development and am familiar with the corporate environment and working style. I have developed various personal projects in the field android development and AR/VR development. I developed Various projects/games in [Pocket Code](#) and [Scratch](#) also. And I contributed my code in catrobat codebase.

I joined the catrobat community in **July-2020** and from then to now I have worked on various small and big projects of the community under the guidance of **Mr. Wolfgang Slany Sir** and I am working as a [translator](#) for the community and converting various apps/projects from english to hindi.

Now I am familiar with the community very well and also understand the working style of the community. My complete projects and other details are uploaded in [GitHub](#) and [LinkedIn](#) respectively.

## 2.INTEREST:-

After going through the idealist of the catrobat community thoroughly I found “**Awesome Demo Game**” project suitable to my skill set and interest. I have always been fascinated and impacted by games that are not just about gameplay, but that carry a whole universe.Pocket Code provides the perfect tools to express my ideas and with the help of it, I

want to showcase how the Pocket Code and Luna&Cat IDE apps could be used to create big game-projects like- “[Hollow Knight](#)”.

Pocket Code has functionalities like storing the data locally on a device, which can be utilized to create save points for the game. There are various sensors like **accelerometer** and **multi-touch** which are used in the game to showcase the potential of Pocket Code. My plan is to design and develop an awesome tutorial game in **Catrobat Visual Programming Language** using the Luna&Cat IDE app.

This game is playable on both phones as well as on smart TV when cast. Means we can **use the phone as a gamepad, and the TV for playing.** and **use multi-touch, phone's sensors, magnetic fields, acceleration, vibration** and other features of pocket code as well.

The game name is **“King Of Batona”**.



**King Of Batona** is basically a classically styled 2D action-adventure game across a vast interconnected world just like the **Hollow Knight** game. The game will have 9 different levels. In Every level you will cross

the hurdles and fight with the monster of that level. In each level you get a special power which will help in defeating the giant monster at last level.

### **Brief Game Story:-**

**Batona** Is a kingdom of great warriors. The king of that kingdom is **Batro**. He is a master of various weapons and fighting styles. He is also a music lover and peace lover king. his people are always very happy with his work. In one evil night the father of darkness and king of monsters **Martian** attacked in **Batro Kingdom** and destroyed it. Batro decides to fight for his kingdom and for his people.

(**Note** :-I will also update my game story and slightly game idea according to my mentor and core community suggestions)

### **Sample character-Batro**



The complete game is revolving around this story. In each level king Batro fights with one of the evil monsters and crosses the hurdles and In the last level king fights with **giant monster Martian** and frees his **kingdom** from the evil monsters.

The main character of the game is **Batro**, he is heavily inspired by the logo of Catrobat. The player follows Batro in his journey. The game-story is easily depicted through **cinematic cutscenes** for better insight. The game is very easy to play and get into, with **on-screen controls**, and a fairly simple **UI**. This game shows how the 'Pocket Code' app can be used to develop **high-quality video games**, if used efficiently and effectively.

The sample video of the demo game is uploaded in my [google drive](#). and sample demo game is uploaded to the **scratch website** with the name [King Of Batona:- Demo Game](#).

### 3.SCRATCH:-

I created and remixed various projects on **Scratch's website**. My username in scratch website is [aman09072000](#).


#### Some of My Projects :-

- [MyCalculator](#) :- Developed an advance calculator in which the user will perform the basic and advanced mathematical operations.
- [Do-Do Driver](#) :- A cool bike game just like a popular bike game [Dirt bike](#).
- [Risky Run](#) :- A game in which players face the hurdles in the way and save his life from the evil enemy.
- [Bubbly Block](#) :- In this game, players perform left, right, and jump operations and face hurdles to win the game.

### 4.POCKET CODE:-

I am an active user of **Pocket Code** app. I uploaded, remixed and played various pocket code games. My username in the Pocket Code website is [Aman09072000](#).

#### Some of My Projects :-

- |  |  |
|--|--|
| • <a href="#">Flying Bjrangi</a>  | -> <a href="#">Pro Sniper</a>            |
| • <a href="#">Shooting Ninja</a>   | -> <a href="#">BatRax : Combat</a>       |
| • <a href="#">Rocket Ride</a>  | -> <a href="#">Crazy Run</a>             |
| • <a href="#">Flying Fingo</a>   | -> <a href="#">Push-Polly-Push</a>       |
| • <a href="#">Frogger - cross the roads!</a> (remix)   | -> <a href="#">Isaac rebirth</a> (remix) |

I also cast a few games from my phone to a smart TV and play them.

- [Batroid - v1.0.1](#)
- [The Binding of Krishna](#)
- [Head bounce the ball](#)

I use pocket code app on my android phone and on my laptop also with the help of **BlueStacks android emulator**.

## **5.MOTIVATION:-**

As a computer science engineering student (specialization in VR/AR and game development) I am always fascinated about AR/VR, games and game development. Nearly 1 year ago when i first heard about the GSoC program .I decided to be a part of it. At that time my main focus was to find a good organization in the field of **AR/VR** and **game development**.

I found the Catrobat organization best fit for me. as it completely matches my area of interest and my background. When I joined the community (**July-2020**) at that time I was only familiar with game development but by the guidance of mentors of the community (**Mr. Wolfgang Slany , Ash Green**) I learnt various new skills here. I contribute to various different areas of the community (**Jira, translation, codebase, pocket code App**). The learning curve of the community is very helpful. And now I can say that I know most of the things related to the Catrobat organization.

I plan to contribute especially in this project because by doing this project I show that how the '**Pocket Code**' app can be used to develop high-quality video games, if it is used efficiently and effectively. I want to change the mindset of people towards **block-based coding**.

I also plan to contribute more in the Catrobat community **after my GSoC** time period and I discussed a few interesting project ideas with the community head also.

## **6.CONTRIBUTION:-**

I have successfully cloned and forked the multiple projects of Catrobat organization ([catroid](#), [catroid3D](#), [paintroid](#) ) on my local machine and built the apps locally and went through their codebase.

I am an active contributor of [catrobat jira](#) (Issue tracker) . My username is [aman09072000](#) .

### **Links of my Contributions :-**

- [CAROTID-982](#) :- Adding more cases for test of maximum function.
- [CAROTID-989](#) :- Adding an assert in test length function.
- [CAROTID-990](#) :- Improve visuals of testSetGravityForAllActorsAndObjects test.
- [CAROTID-991](#) :- Adding a special case of power and adding separate assert for each case.
- [CAROTID-994](#) :- Adding test case in minimum function. and create separate asserts for each test case.

I am also an active contributor of the Catrobat project in [Crowdin](#)( translation platform ) and part of official **translators Slack group** of Catrobat.

I convert various apps/projects of Catrobat organization from english to hindi.My username is [aman09072000](#) .

I also developed various games/projects with the help of **Pocket Code App**. All games/project is uploaded on the **Pocket Code website**. My username in the pocket code website is [Aman09072000](#).

## **7. MOBILE HARDWARE:-**

I will be using **realme narzo 20A (Android 10)** for the development of **Awesome Demo Game Project** . I will also be running **BlueStacks emulator** on my **asus vivoBook (8 Gb Ram, Intel i5, 2 Gb graphic card)** for easily monitoring my game and use for creating the game assets like character designing, background designing, cutscenes and for developing of music and the sound effects used in the game.

My main focus is to develop a game which is playable in both on a phone as well as when cast from the phone to a smart TV. For that I use my home smart TV (**sony bravia 24-Inches**).

## **8. TEST DRIVEN DEVELOPMENT:-**

**Test-driven development (TDD)** is process depends on software requirements being converted to test cases before software is fully developed, and tracking all software development by repeatedly testing the software against all test cases. This is opposed to software being developed first and test cases created later.

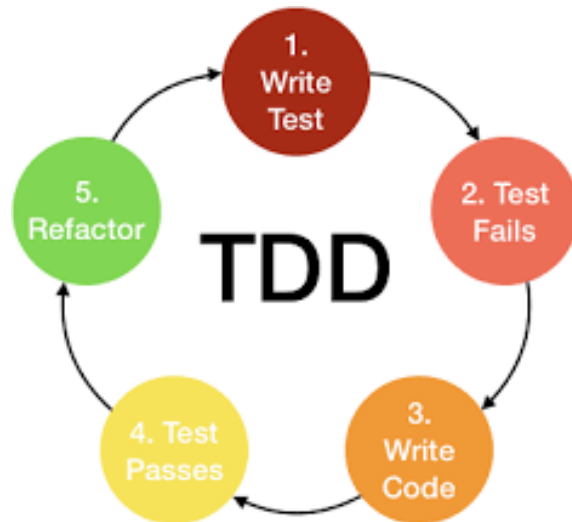
TDD instructs the programmers/developers to think of a new solution and write new code only if an automation test has failed. This avoids duplication of code as we write a small amount of code in order to pass tests.

The steps involved in TDD are-

- Add a test.
- Run all tests and see if any new test fails.
- Write some code.
- Run tests and refactor code.
- Repeat

Advantage of TDD is that it makes the code clean, simple and bug free.





## 9. USABILITY: -

**Usability** can be defined as how comfortable and convenient it is for the user to use or interact with that software. we can also say that, if an app/software is easy to understand or is able to satisfy the user base, then the app/software is said to have a great usability or a good user interface (UI).

On the other hand, **user centered design** is a designing technique in which the user plays a pivotal role, not just in usability, but for the development of the app/software throughout its development phase.

A great **example** of user centred design can be seen in every iteration of android. In every new version of android, the android engineers ask and take feedback from a group of users before the release of the original version. The feedback helps the engineers to decide upon a certain feature that they introduced, whether the user base liked it or not. After some positive feedback and bug testing about the features, the version with those features are finally released publicly.

**This helps to create a highly usable, consistent and accessible app for the users.**

## **10. EXPERTISE:-**

As I am a Computer science engineering student with specialization in AR/VR and game development. I am completely familiar with the game development process and I know how to develop a creative and beautiful game.

I completed 2 courses from Facebook school of innovation in the field of **AR/VR designing**. where I learned character designing and background designing. I am familiar with **designing and development tools** (Adobe Photoshop, Figma, Adobe XD, etc). By the help of these tools, I make my game more attractive and user friendly.

I am confident and also have experience in **block based coding**. I am also an android developer (java / kotlin) which is a plus point in my case as I easily understand the **codebase of catrobat** and know how things work there.

I have been working in the community from last **9-months** and now I am familiar with the working style of the community and with the pocket code app. I worked with almost complete pocket code app and know the ability of it.

## **11. HUMAN LANGUAGE SKILLS:-**

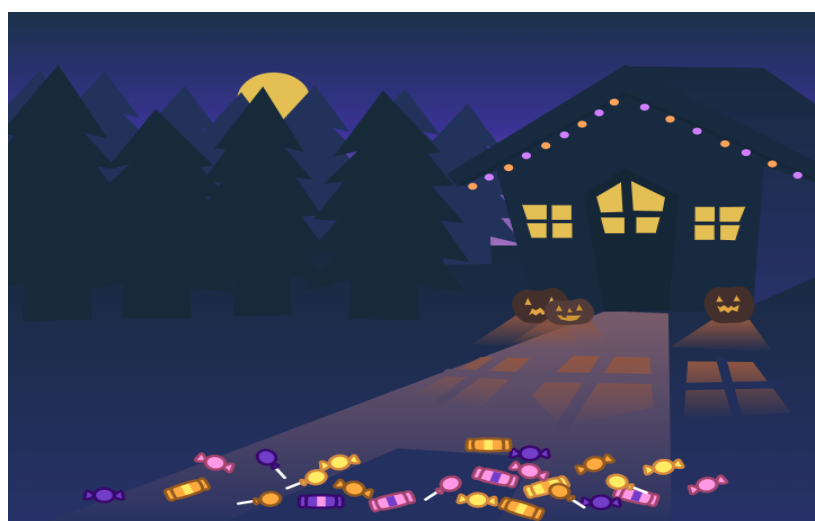
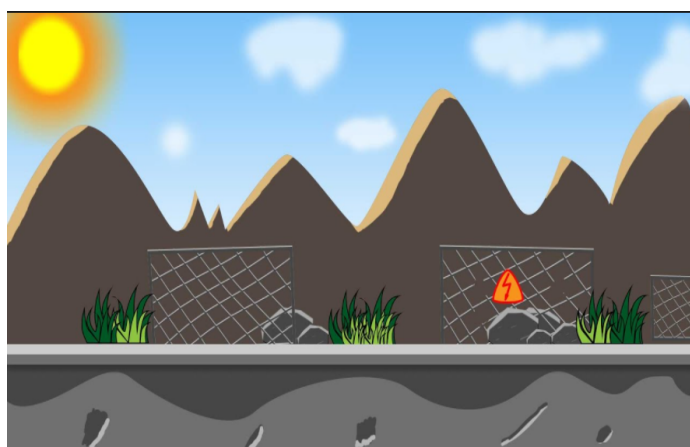
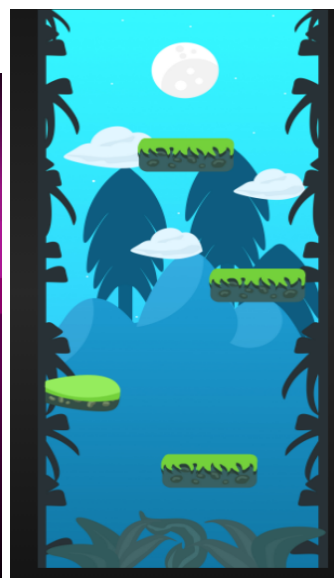
I am fluent in **English** and **Hindi** in both ways that is verbally and in written forms.

## 12. GRAPHIC DESIGN SKILLS:-

I generally use **Adobe Photoshop** and **Figma** (software) for graphic designing purposes. I create **characters, backgrounds, logos, symbols, banners** in these software.

I give **8/10** rating to my **graphic designing skills**.

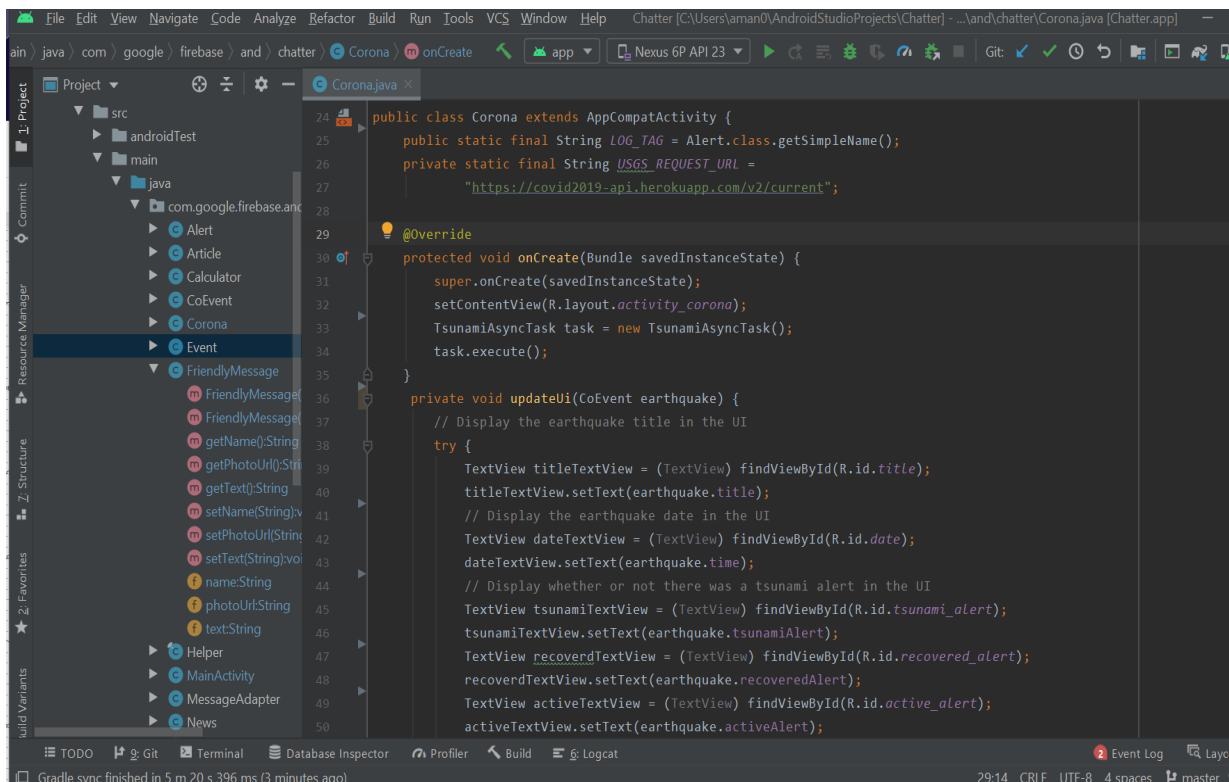




## 13.CODE SAMPLES:-

I worked on various projects related to Android development. which is present in my [gitHub profile](#). I contributed my code in **Catrobat codebase** And I also develop various projects in [pocket code](#) as well. find all my projects on the [pocket code website](#).

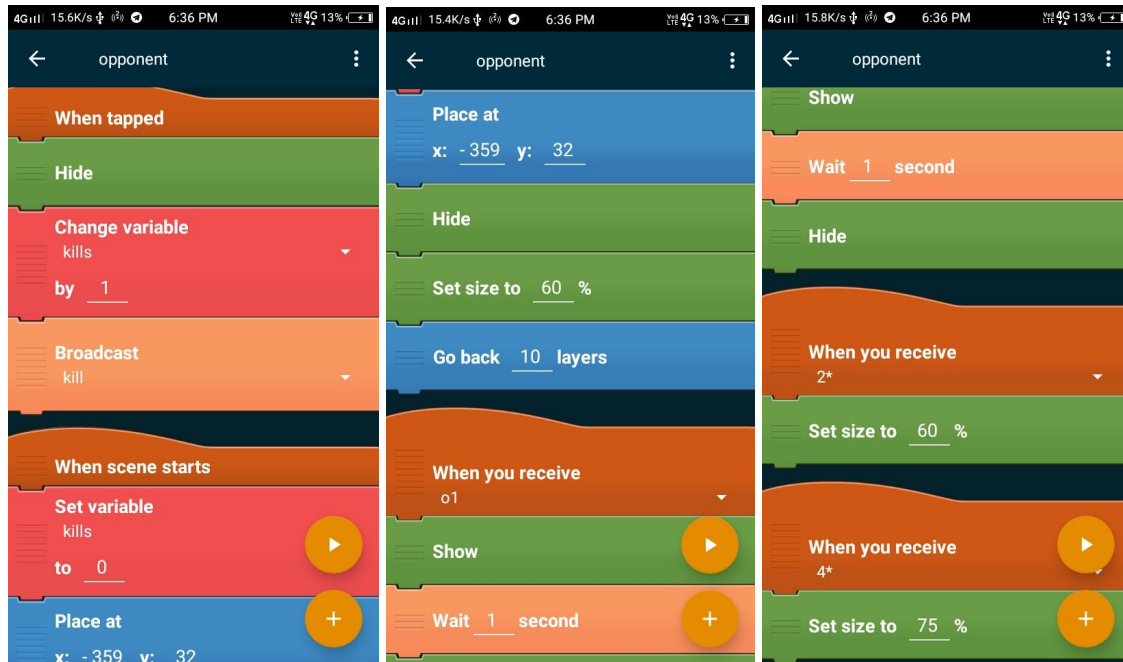
The screenshots of the [CoronaUpdate code](#) from my project [Chattery:-Secure global Chatting App](#).



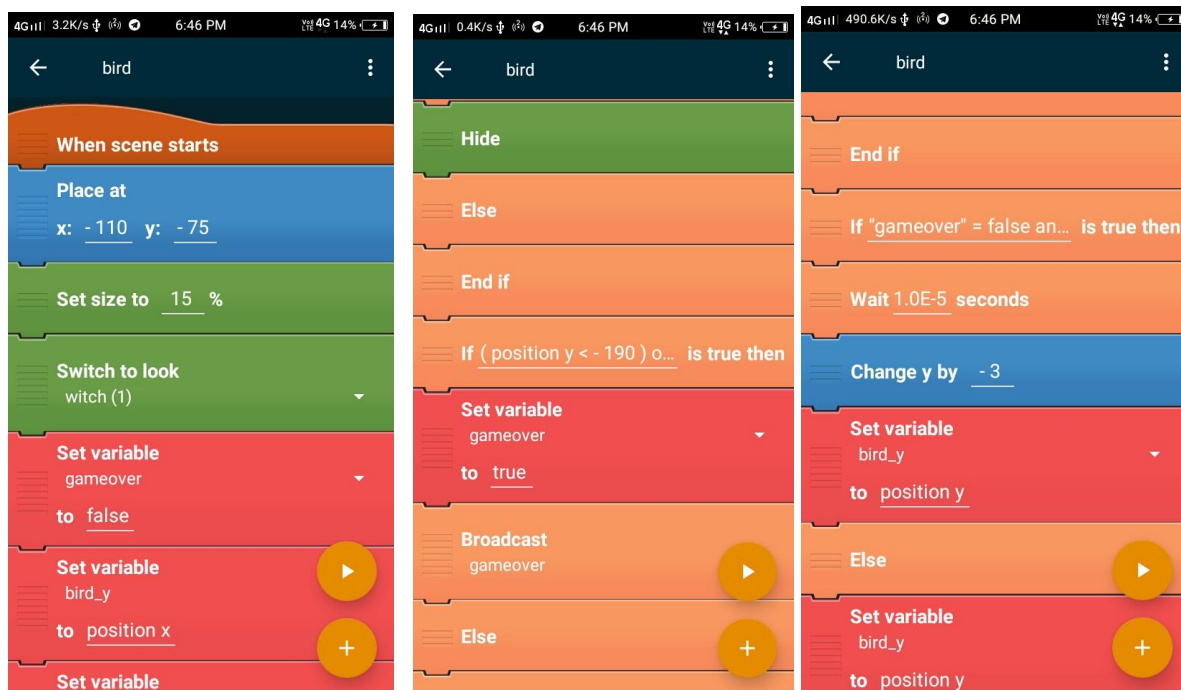
```
24 public class Corona extends AppCompatActivity {
25     public static final String LOG_TAG = Alert.class.getSimpleName();
26     private static final String USGS_REQUEST_URL =
27         "https://covid2019-api.herokuapp.com/v2/current";
28
29     @Override
30     protected void onCreate(Bundle savedInstanceState) {
31         super.onCreate(savedInstanceState);
32         setContentView(R.layout.activity_corona);
33         TsunamiAsyncTask task = new TsunamiAsyncTask();
34         task.execute();
35     }
36
37     private void updateUi(CoEvent earthquake) {
38         // Display the earthquake title in the UI
39         try {
40             TextView titleTextView = (TextView) findViewById(R.id.title);
41             titleTextView.setText(earthquake.title);
42             // Display the earthquake date in the UI
43             TextView dateTextView = (TextView) findViewById(R.id.date);
44             dateTextView.setText(earthquake.time);
45             // Display whether or not there was a tsunami alert in the UI
46             TextView tsunamiTextView = (TextView) findViewById(R.id.tsunami_alert);
47             tsunamiTextView.setText(earthquake.tsunamiAlert);
48             TextView recoverdTextView = (TextView) findViewById(R.id.recovered_alert);
49             recoverdTextView.setText(earthquake.recoveredAlert);
50             TextView activeTextView = (TextView) findViewById(R.id.active_alert);
51             activeTextView.setText(earthquake.activeAlert);
52         }
```

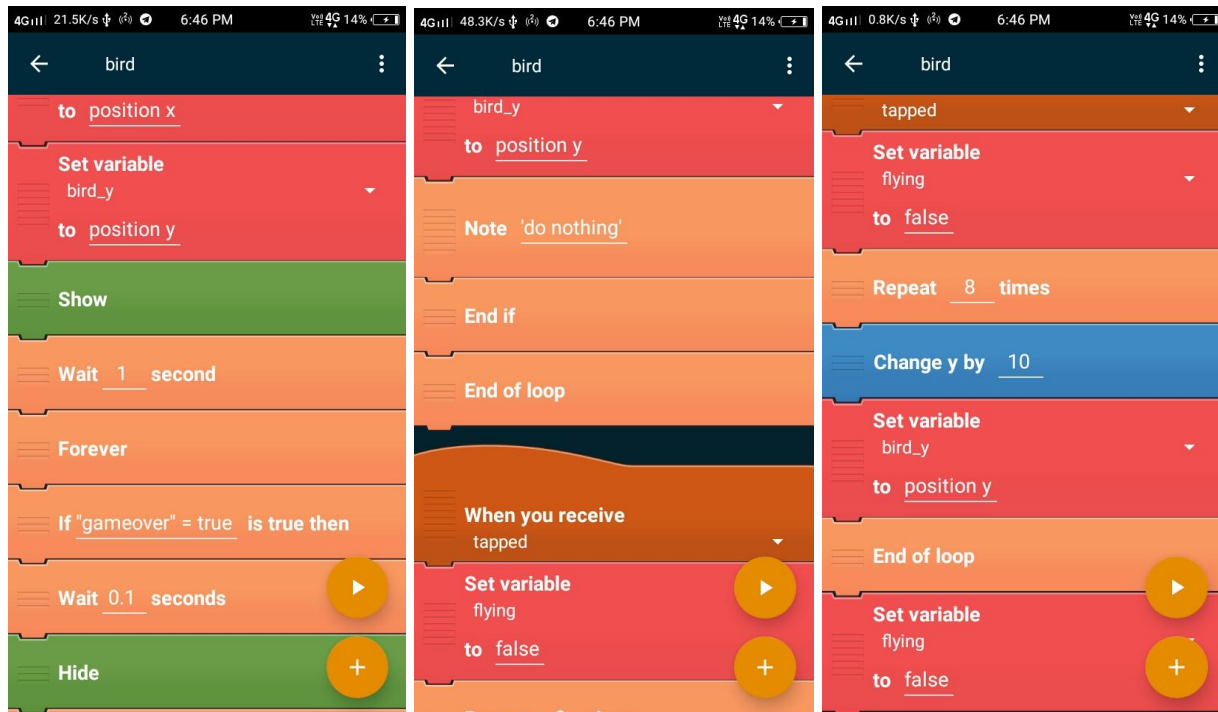
The snippets of **Catrobat Visual Programming Languages** from my games are attached below.

## Game name : Pro-Sniper



## Game name : Flying-Fingo





## 14.TOOL CHAIN:-

The development tools which I use and are relevant to Catrobat are **Android Studio, Git/GitHub, Jira, Crowdin, VScode, Xcode, Adobe Photoshop, Figma, Scratch and Pocket Code.**

## 15.REMOTE COOPERATION:-

I will be cooperating with the community using the **google Mailing list** and **email**. for the remote code review sessions, we use **gitHub**. I will also share my project's various versions on the **pocket code website** also. So that my mentor easily monitors my progress. We will also plan video sessions through **skype/zoom** if required.

## **16.ROUGH TIME SCHEDULE:-**

### **Before Community Bonding Period (before May 17)**

- Start working on the storyline of the game.
- Mapping complete game flow.
- Start working on different levels of the game.
- Finalize different characters of the game and their role in the game.
- Create the basic layout of the main screen of the game.

### **Community Bonding Period (May 17 to June 7)**

- Discuss complete Ideas of the game with my mentor.
- Discuss about the story, character and their role in the game with the mentor and the look of each character which I decide and take his opinion on it.
- Update and work on all weak points which they suggested to me.
- Finalize the story, character and complete game layout.
- Finalize complete levels of the game with their difficulty and story.
- Complete the main page designing of the game.

### **Official Coding Period ( June 7 to August 16 )**

In the official coding period I will be in a consistent touch with my mentor and the Catrobat community and I spend on average 20-25 hours a week on the program.



### **Week- 1 ( June 7 to June 13)**

- Designed few main character's of the game
- Designed level-1 background and added moving buttons in it.
- Start working on the sound of the game.
- Developing a few story cutscenes for the game.

### **Week- 2 ( June 14 to June 20)**

- Developed the main sound track of the game.
- Finish level-1 designing and add it in game.
- Start working on level-2 background designing.
- Add a few more power buttons in the game.

### **Week- 3 ( June 21 to June 27)**

- Work on a few more story cutscenes of the game.
- Complete level-2 designing and add it in game.
- Creating character which is left.
- Add the main theme song to the game and link each scene with the other scene.

### **Week- 4 ( June 28 to July 04)**

- Start working on level-3 and level-4 backgrounds.
- Complete story cutscenes and link them all with the game.
- Work on game components and try to make it user friendly and attractive.

### **Week- 5 ( July 05 to July 11)**

- Complete level-3 and level-4 and add both levels in the game.
- Add sound for the main character in the game.
- Work on user control / User Interface and difficulty level of the game.

### **Week- 6 ( July 12 to July 18)**

- Complete level-5 designing and add it in the game.
- Add a character health monitoring bar in the game.
- Check complete working of the game along with user Interface and sound.

### **First Evaluation**

The first evaluation game is **ready to play** and a user will easily play it from **level-1 to level-5**. And the **cutscene story** and sound (theme sound, character sound) of the game is also present.

### **Week- 7 ( July 19 to July 25)**

- Start working on the level-6 background and designing.
- Add a start button and replay button in our game.
- Designing monster boss character and creating sound for it.

### **Week- 8 ( July 26 to August 01)**

- Complete level-7 and level-8 of the game.
- Create asserts of the game.
- Develop a menu bar in our game with an attractive UI.

### **Week- 9 ( August 02 to August 08)**

- Start working on the final level (level-9) of the game.
- Add a boss health bar in the game.
- Finalize complete game components and sounds of the game.

## Week- 10 ( August 09 to August 15)

- Designed an innovative "You Win" Scene for the game.
- Finalise/Test complete game and start preparing for final evaluation.
- Upload complete game and game components in GitHub.

## Final Evaluation

In final evaluation the game is completely ready to upload on the Pocket Code website. This game will carry an **interesting story**, **beautiful user interface** and **awesome sound effects** as well.

## 17.INTEGRATION:-

I divided my whole project into four main parts: -

- Designing of game components (character's, backgrounds and cutscenes).
- Creating sound effects (theme sound, character sound).
- Coding part of the game.
- Testing

Every week I tried to give equal time to each of these steps. so that I complete my project on time. I am also ready to give extra time to any of the steps if needed.

I am uploading my project to the **pocket code website** and **gitHub** after **every 2-week** so that my *mentor* will easily *monitor* my progress.

I will try to complete this project before the GSoC period ends by following all these steps. So that project uploaded to the pocket code website successfully and on time.

## 18.COMMENTS:-

- During the community bonding period (May), I will take my finals. So, in those days I will put in not more than 5-6 hours daily to work on the proposed project.
- In the coding period (June, July, August). I will totally commit to working on catrobat.
- In the last week of July, i will go to delhi to attend the android conference for two days, but i will make sure to compensate for the work beforehand so that i don't miss my set target.
- I have **No** obligations and I will work full time on the proposed project during the GSoC period.

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