Department of Computer Science Engineering
SYMBIOSIS INSTITUTE OF TECHNOLOGY, PUNE

MINI PROJECT REPORT

ALTERNATE REALITY GAME

Submitted by

GROUP - 13

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ABSTRACT:

For every possible way the user can violate the story plan, an alternative story plan is generated. The user can create their own story. The user can go about the story according to their preferences. At every step, there are choices for users to select their next step of the story. In this way the story is continued till the end. The story can have a number of conclusions according to what the user chooses. Every option chosen leads to a twist in the story. Games of this kind have been already made and are popular around the world. In a way, this project can help the user to enhance their thinking skills and boost their creativity. The tree concept is the major data structure present in this project. We basically use the concept of a binary tree for this project. The report goes through the division of project work among team members and time period invested in each part of the project. It insights on the project flow and design of the program.

INTRODUCTION :

The idea of the project is to provide the user with a creative platform. The user is provided with options to choose between different modes at first - whether they want to create their own game or play the sample game. In the sample mode, at every step there are choices for the user to select their next step of the story where each option leads to a twist in the story. In the creator mode, they can create their own story while checking the progress side by side using the player mode.

The project is entirely based on the concept of trees, binary trees to be very specific. Binary tree is a non-linear data structure which can have at most two child branches connected to a single node and those two child branches have other branches connected to at most two children and so on. The first node created in a binary tree is known as the root node that connects to at most two child nodes. As we have been learning this concept in class, our group has come up with a plan to implement this data structure in our project.

LITERATURE SURVEY & GAPS:

From online journals, we have come across discussions on how binary trees can be used to create games. There are online games that are categorized under stories. For example, the website *chooseyourstory* is an online platform where people have uploaded their creative stories for others to play. The process of each of these games involves options. Hardly any sites have talked about how this game can be made using C++ and tree data structure, hence we decided to try and do it.

ADVANTAGES:

- Our program provides the user with three modes.
- Depending on the mood, the user can choose to play the sample game, or create his or her own story.

- The scope of the project is big enough. Users can add more features to the existing program to make it a bigger project.
- The Sample game can be changed according to users' preference.

DRAWBACKS:

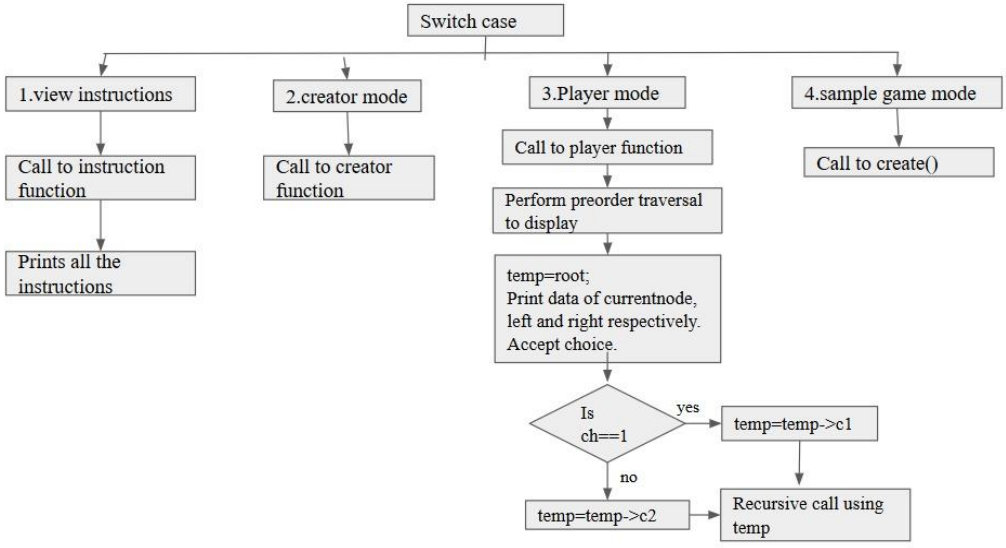
- Program is written in C + + , so it lacks use of graphics.
- There is no way to store the created story for later use.

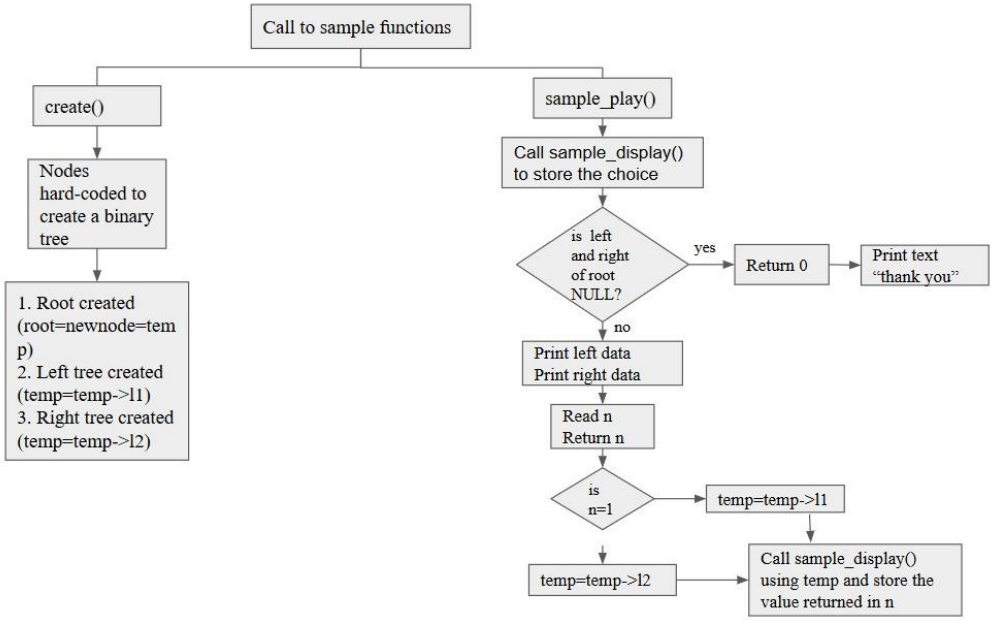
NOVELTY OF WORK:

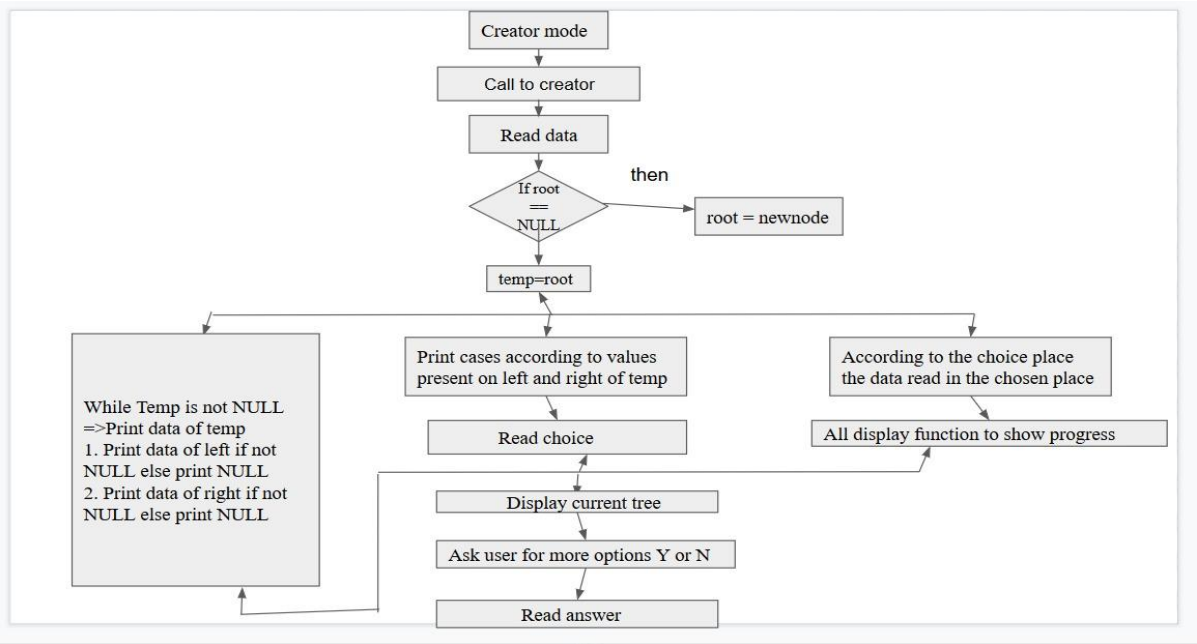
The novelty of our project is that we allow the user to create their own story in which they can make their own words and form their own scenes of their creative story. As programmers, we will be implementing our own creativity also in the process of listing the types of scenes or genres the user would like to include in their story. There have been discussions on how binary trees can implement stories if they are designed and programmed properly but there are not many examples of such games that use binary tree structure. Therefore, this project will form a game where we utilize the structure of the binary tree to create a story game for the user.

ARCHITECTURE/ BLOCK DIAGRAM/DESIGN DIAGRAM:

The design of the program follows the structure of a complete binary tree. Initially, there will be a root node and that is the start of the story. Later we create parent nodes from the root node that store the option that the user has selected from the list of options presented to them. The building of story will have questions or words that are asked to the user and the user will have to choose an option.




Call to sample functions
create()
Nodes hard-coded to create a binary tree
1. Root created (root=newnode=temp)
2. Left tree created (temp=temp->l1)
3. Right tree created (temp=temp->l2)
sample_play()
Call sample_display() to store the choice
is left and right of root NULL?
yes
Return 0
Print text "thank you"
no
Print left data
Print right data
Read n
Return n
is n=1
temp=temp->l1
temp=temp->l2
Call sample_display() using temp and store the value returned in n


Creator mode
Call to creator
Read data
If root == NULL
then
root = newnode
temp=root
While Temp is not NULL
=>Print data of temp
1. Print data of left if not NULL else print NULL
2. Print data of right if not NULL else print NULL
Print cases according to values present on left and right of temp
Read choice
According to the choice place the data read in the chosen place
All display function to show progress
Display current tree
Ask user for more options Y or N
Read answer

MODULES/FUNCTIONALITIES IN DETAIL:

1. **Void creator():** The function allows the user to create their own game.
2. **Void display(Node *):** This function displays the creator's story game and allows them to see the progress of their game.
3. **Void player(Node *):** The player function allows the user to play the game created by the creator user.
4. **Void instruction():** This function displays the instructions for all the user modes in this program.
5. **Void sample_play()**: Responsible for traversing the sample tree based on input received from the sample_display function
6. **Int sample_display()**: displays the sample tree in an interactive manner, takes input from the user and sends it to the sample_play function to take the route chosen.
7. **Void create()**: Has the sample game in a binary tree form.

TEAM MEMBER RESPONSIBILITIES(MODULES):

1. Arundarasi Rajendran (18070122081):
    - Research on tree DS
    - Code
    - Improvements
    - Report & Block diagram
2. Aditi Goyal (18070122003)
    - Code
    - Design Algorithm
    - Presentation & Block diagram
    - Editor
3. Pinnam Laxmi Priyanka (18070122043)
    - Research on tree DS
    - Code
    - Bug fixes
    - Report
4. Sri Neelima Chinta (18070122070)
    - Story writer
    - Code
    - Design Algorithm
    - Presentation

SOFTWARE REQUIREMENT:

The following are the software requirements needed for this mini project.

DEV C++

HARDWARE REQUIREMENT:

The following are the hardware requirements needed for this mini project.

Laptop or PC

TIMELINE

Task	Duration	Start Date	End date
Deciding the project & members	**5**	**22-Jan-20**	**26-Jan-20**
SRS	**4**	**2-Feb-20**	**6-Feb-20**
Research on Tree DS	**7**	**20-Feb-20**	**27-Feb-20**
Design Algorithm	**5**	**11-Mar-20**	**15-Mar-20**
Coding	**10**	**16-Mar-20**	**25-Mar-20**
Test	**1**	**25-Mar-20**	**26-Mar-20**
Bug fixes	**2**	**26-Mar-20**	**28-Mar-20**
Improvements	**4**	**28-Mar-20**	**31-Mar-20**
Final Testing	**2**	**1-Apr-20**	**3-Apr-20**
Submission	**1**	**4-Apr-20**	**4-Apr-20**

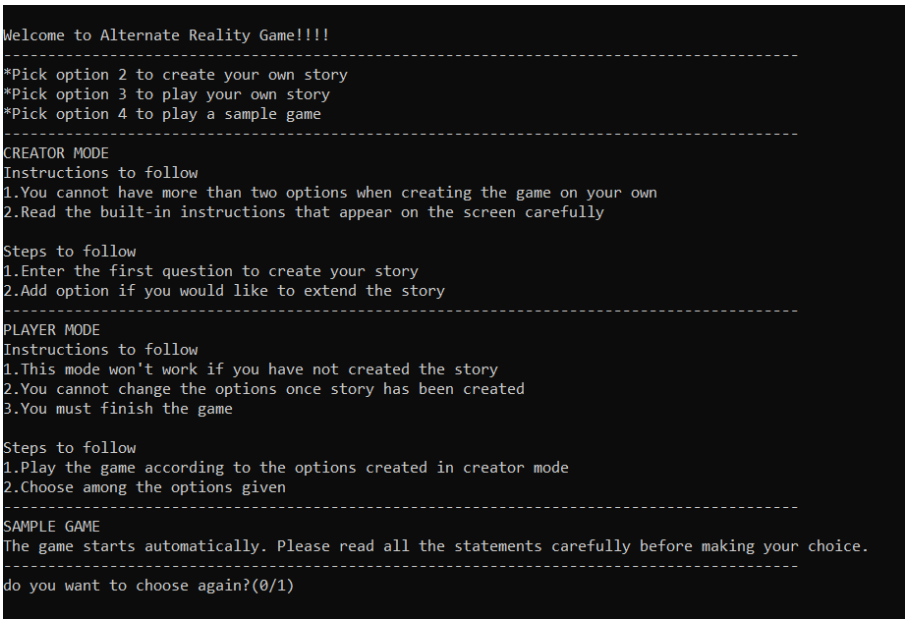
CODE SCREENSHOTS:

```
#include<iostream>
using namespace std;
class Node
{
        public:
                string data;
                Node *c1, *c2, *l1, *l2;
                //int c=0;
                Node()
                {

                }
                Node(string data)
                {
                        this->data = data;
                        this->c1=NULL;
                        this->c2=NULL;
                        this->l1=NULL;
                        this->l2=NULL;
                }
};

class Tree:public Node
{
        public:
        Node *temp,*root,*listptr;
        Tree()
        {
                listptr=temp=root=NULL;
        }
        void create();
        void sample_play();
        int sample_display(Node *);
        void creater();
        void display(Node *);
        void player(Node *);
        void instructions();
};
void Tree::create(){
Node *newnode = new Node("You sit down on the edge of your bed and frown down at the progress you
root=newnode;
temp=newnode; //choice 1
temp->l1 = new Node("I'm starving. Let's eat!\n\n[Read after you make your choice]\nYour hunger i
listptr=root->l1;
temp->l2 = new Node("I really should finish packing.\n\n[Read after you make your choice]\nYou de

temp=temp->l1; //left tree
temp->l1 = new Node("Try to find a way out through the kitchen.\n\n[Read after you make your choi
temp->l2 = new Node("Run upstairs.\n\n[Read after you make your choice]\nYou freak out and run up
temp=temp->l1;
temp->l1 = new Node("END");
temp->l2 = new Node("Try Again");
temp=temp->l2;
temp->l1=NULL;
temp->l2=root;
temp=listptr;
temp=temp->l2;
temp->l1 = new Node("To the hotel\n\n[Read after you make your choice]\nWhen you get to the hotel
temp->l2 = new Node("END");
temp=temp->l1;
temp->l1= new Node("You are back in the lobby and you can hear Jake say,Wow this place is huge! 2
temp->l2=new Node("END");
temp=temp->l1;
temp->l1=new Node("Three days later...\n\nYou are in your room lying on your bed. You are trying
temp->l2=new Node("END");
temp=temp->l1;
temp->l1=new Node("Go check on Mary.\n\n[Read after you make your choice]\nYou get up and go to w
temp->l2=new Node("Stay here. She's fine\n\n[Read after you make your choice]\nEND");
temp=root;
listptr=root->l2;
temp=temp->l2;  //right tree
temp->l1=new Node("Offer to drive.\n\n[Read after you make your choice]\nYou get in the car and s
temp->l2=new Node("Wait for someone else to offer\n\n[Read after you make your choice]\nRyan offe
temp=temp->l1;
temp->l1=new Node("Stop and eat\n\n[Read after you make your choice]\nI'm hungry too, let's eat.Y
temp->l2=new Node("Drive directly to the hotel\n\n[Read after you make your choice]\nWhen you get
temp=temp->l1;
temp->l1=new Node("Once you get there you see a bunch of police cars outside the hotel.\nYou can
temp->l2=new Node("Try Again");
temp->l2->l1=root;
temp=listptr;
temp=temp->l2;
temp->l1=new Node("When you get to the hotel you walk into the lobby and Jake says,Wow,this place
temp=root;
}

int Tree::sample_display(Node *root){
cout << root->data << endl;
```

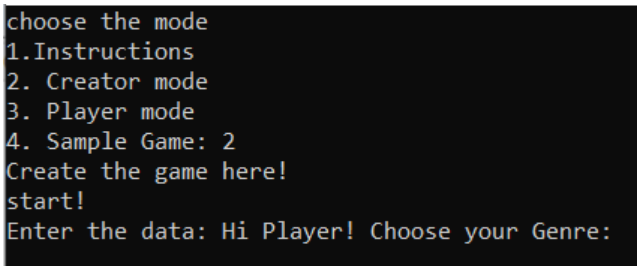
```
102 void Tree::sample_play()
103 {
104 int n=sample_display(root);
105 temp=root;
106 do{
107 if(n==1){
108 temp=temp->l1;
109 }else {
110 temp=temp->l2;}
111 n=sample_display(temp);
112 if(n==0){
113 cout << "Thank you for playing Hope you had good time\n";
114 }
115 }while(n);
116 }
117
118
119 void Tree::display(Node *currentnode)
120 {
121         if(currentnode!=NULL)
122         {
123                 cout<<currentnode->data<<"\n";
124                 display(currentnode->c1);
125                 display(currentnode->c2);
126                 cout<<"\n";
127         }
128 }
129
130 void Tree::creater()
131 {
132         //int l;
133         char ans;
134         string s;
135         int n;
136         do{
137                 fflush(stdin);
138                 cout<<"\nEnter the data: ";
139                 getline(cin,s);
140                 Node *newnode = new Node(s);
141                 if(root==NULL)
142                 {
143                         root=newnode;
144                         cout << "Main Question Created\n";
145                 }
146                 else
147                 {
148                         //c++;
149                         temp=root;
150                         while(1)
151                         {
152                         if(temp){
153                                 cout << "Current Question is: " << temp->data << endl;
154 //                              for(l=c;l>0;l--)
155 //                              {
156 //                                      cout<<" ";
157 //                              }
158                                 if(temp->c1)
159
160                                         cout << "option 1: "<< temp->c1->data << endl;
161                                 else
162                                         cout << "option 1: NULL\n";
163                                 if(temp->c2)
164                                         cout << "option 2: "<< temp->c2->data << endl;
165                                 else
166                                         cout << "option 2: NULL\n";
167                         }
168                         if(!temp->c1 && temp->c2)
169                                 cout<<"Do you want to move towards option 2 or add to option 1: "
170                         else if(!temp->c2 && temp->c1)
171                                 cout<<"Do you want to move towards option 1 or add to option 2: "
172                         else if(temp->c2 && temp->c1)
173                                 cout<<"Toward which option you want to move?(Option 1 or 2): ";
174                         else
175                                 cout<<"Do you want to add to option 1 or 2: ";
176                         cin>>n;
177                         if(n==1)
178                         {
179                                 if(temp->c1==NULL)
180                                 {
181                                         cout << "Option/Question added to Option 1\n";
182                                         temp->c1=newnode;
183                                         display(root);
184                                         break;
185                                 }
186                                 else
```

```
                system("CLS");
                cout << "Current tree is\n";
                display(root);
                cout<<"\n\nDo you want to add options to the Game?(y/n)";
                cin>>ans;
        }while(ans=='y');
        display(root);
}
void Tree::player(Node *node)
{
        int ch;
        temp=node;
        cout<<temp->data<<"\n";
        cout<<"1."<<temp->c1->data<<"    ";
        cout<<"2."<<temp->c2->data;
        cout<<"\nwhat do you choose?";
        cin>>ch;
        if(ch==1)
        {
                temp=temp->c1;
        }
        else
        temp=temp->c2;
        player(temp);
}
void Tree::instructions()
{
    cout<<"\nWelcome to Alternate Reality Game!!!!\n";
    cout<<"-----------------------------------------------------------------------------------------";
    cout<<"*Pick option 2 to create your own story\n";
    cout<<"*Pick option 3 to play your own story\n";
    cout<<"*Pick option 4 to play a sample game\n";
    cout<<"-----------------------------------------------------------------------------------------";
    cout<<"CREATOR MODE\n";
    cout<<"Instructions to follow\n";
    cout<<"1.You cannot have more than two options when creating the game on your own\n";
    cout<<"2.Read the built-in instructions that appear on the screen carefully\n";
    cout<<"\nSteps to follow\n";
    cout<<"1.Enter the first question to create your story\n";
    cout<<"2.Add option if you would like to extend the story\n";
    cout<<"-----------------------------------------------------------------------------------------";
    cout<<"PLAYER MODE\n";
    cout<<"Instructions to follow\n";
    cout<<"1.This mode won't work if you have not created the story\n";
    cout<<"2.You cannot change the options once story has been created\n";
    cout<<"3.You must finish the game\n\n";
    cout<<"Steps to follow\n";
    cout<<"1.Play the game according to the options created in creator mode\n";
    cout<<"2.Choose among the options given\n";
    cout<<"-----------------------------------------------------------------------------------------";
    cout<<"SAMPLE GAME\n";
    cout<<"The game starts automatically. Please read all the statements carefully before making
    cout<<"-----------------------------------------------------------------------------------------";
}
int main()
{
        Tree t,l;
        int ch1,ans,ch;
        do
        {
                cout<<"choose the mode\n1.Instructions\n2. Creator mode\n3. Player mode\n4. Sampl
                cin>>ch1;
                switch(ch1)
                {
                        case 1:t.instructions();
                        break;

                        case 2:
                        cout<<"Create the game here!\n";
                        cout<<"start!";
                        t.creater();
                        break;

                        case 3:
                        t.player(t.root);
                        break;

                        case 4:
                        cout<<"Start of Sample Game\n\n";
                        cout<<"Death has been around since the beginning of time.\n";
                        cout<<"For every death there is a life and for every life there is a deat
                        cout<<"\nBut what if you could cheat Death? What if when you cheated deat
                        cout<<"This game is about how cheating death is just delaying the inevita
                        cout<<"\nDo you want to risk your life(1) or run away(0)?";
                        cin>>ch;
                        if(ch==1)
                        {
                          l.create();
```

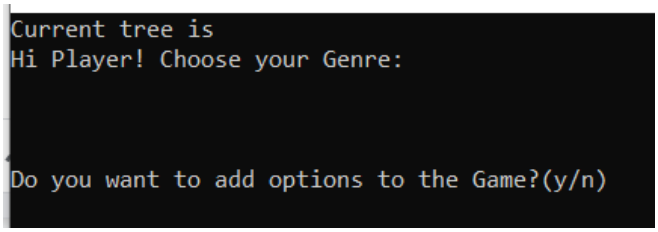
RESULTS/ SCREENSHOTS



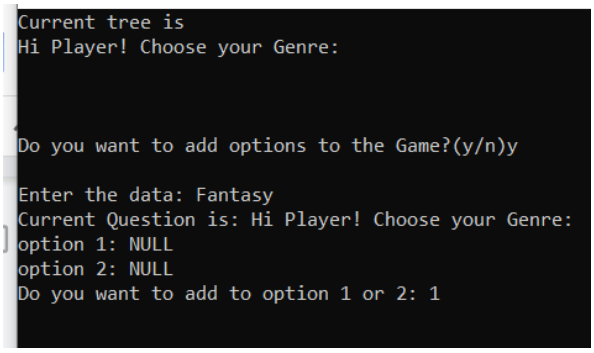
1. First option chosen and instructions are viewed.



2. Second option chosen, the creator asked to enter the data for the root node.



Once enter is pressed, the screen is cleared and the creator is shown the progress of his work. (the tree)
Then the creator is asked for more options.



Once he enters the option, he's asked where he wants to add the option depending on the values present in the current node's left and right.

```
Current tree is
Hi Player! Choose your Genre:
Fantasy



Do you want to add options to the Game?(y/n)y

Enter the data: Thriller
Current Question is: Hi Player! Choose your Genre:
option 1: Fantasy
option 2: NULL
Do you want to move towards option 1 or add to option 2: 2
```

Above steps are repeated until the creator chooses to end the story by entering ‘n’.

```
Current tree is
Hi Player! Choose your Genre
Fantasy

Thriller




Do you want to add options to the Game?(y/n)y

Enter the data: Teleport
Current Question is: Hi Player! Choose your Genre
option 1: Fantasy
option 2: Thriller
Toward which option you want to move?(Option 1 or 2): 1
Subtree of Fantasy
Fantasy

Current Question is: Fantasy
option 1: NULL
option 2: NULL
Do you want to add to option 1 or 2: 1
```

```
Current tree is
Hi Player! Choose your Genre
Fantasy
Teleport

Fly


Thriller
Kill

Murder




Do you want to add options to the Game?(y/n)n
Hi Player! Choose your Genre
Fantasy
Teleport

Fly


Thriller
Kill

Murder



do you want to choose again?(0/1)
```

```
do you want to choose again?(0/
choose the mode
1.Instructions
2. Creator mode
3. Player mode
4. Sample Game: 3
Hi Player! Choose your Genre
1.Fantasy    2.Thriller
what do you choose?1
Fantasy
1.Teleport    2.Fly
what do you choose?2
Fly
```

3. Third mode is the player mode where the creator can execute his story and see if it works properly.

4. Option 4 is a sample game that the team has worked on.

```
Start of Sample Game

Death has been around since the beginning of time.
For every death there is a life and for every life there is a death.
But what if you could cheat Death? What if when you cheated death was actually when you were meant to die?
This game is about how cheating death is just delaying the inevitable and you will eventually die.
Do you want to risk your life(1) or run away(0)?1
You sit down on the edge of your bed and frown down at the progress you have made at packing.
You hate packing. You are about to spend the weekend with your friends to see the bears game.
You are really excited, not just about seeing the game, but also about getting out of the house for the weekend.
You hear a grumbling noise and realize it's your stomach. You are starving, but you also think you should finish packing. What do you do?

1. I'm starving. Let's eat!

[Read after you make your choice]
Your hunger is driving you crazy, so you walk downstairs and put your dinner in the microwave.
What you don't know is a magnet fell from the fridge into your dinner.
You run back upstairs to keep packing until your food is ready.
You suddenly hear an explosion from the magnet in the microwave.
You start to run downstairs and see the kitchen is on fire! What do you do?

2. I really should finish packing.

[Read after you make your choice]
You decide it would be best to finish packing, so you grab a few CDs at random and put them in your suitcase.
Then you continue folding your clothes and put them in your suitcase.
When you finally finish packing you go downstairs and see your friend Tom.
What's up?He says.
Nothing much, can't wait to get the hell out of here.You reply.
Well everyone's waiting outside for us, you ready to go?
Yeah. Let's go.You say.
You and Tom walk outside and you see Ryan, Mary, Jake, and your girlfriend.
So who's driving?Ryan asks.

Please enter your next option:
```

After the player chooses an option, the story continues and further options are presented to the player until the end of the story.

```
Your hunger is driving you crazy, so you walk downstairs and put your dinner in the microwave.
What you don't know is a magnet fell from the fridge into your dinner.
You run back upstairs to keep packing until your food is ready.
You suddenly hear an explosion from the magnet in the microwave.
You start to run downstairs and see the kitchen is on fire! What do you do?

1. Try to find a way out through the kitchen.

[Read after you make your choice]
You build up your courage and run down the stairs.You manage to reach the other side of the kitchen.
You reach for the door when the entire room is engulfed in flames.
In your last few seconds of life, you desperately try to open the window and escape, and you see your friend Tom's ca
oming to pick you up.
Suddenly it is hit by a semi. You scream in agony before your screams die down and you die along with them.

2. Run upstairs.

[Read after you make your choice]
You freak out and run upstairs. You look around desperately for a way out.
The window! You sprint to the window and push it open and jump out.
You fall two stories and land in your backyard.
You stand up and run to the front yard just as your friends pull into the driveway.
Your friend Tom gets out of the car and asks,The Hell's your problem?
Forget it!You yell.
Just get in the car!We have to leave before my parents get here!
You both get in the car and leave.

Please enter your next option:
```