🤖 PROJECT FORMAT: *AI Storytelling Robot for Kids*

◇ 1. Project Overview

Project Title: Smart AI Storytelling Robot
Developer: Vikas Vishwakarma
Goal:
To build a **low-cost smart robot** that interacts with children by telling stories, answering questions, reading cards, and connecting with AI (like Alexa) for global knowledge.

Estimated Cost: ₹1000 – ₹1500

◇ 2. Objectives

1. To develop a small robot capable of **speech recognition** and **voice output**.
2. To integrate **AI-based storytelling** (predefined stories + online AI).
3. To use a **card reader** module (like RFID or NFC) to detect cards that trigger specific stories.
4. To allow **global AI connectivity** via Wi-Fi or phone hotspot (using simple APIs).

◇ 3. Required Components (Hardware)

Component	Description	Approx. Cost
Arduino UNO / NodeMCU (ESP8266)	Brain of robot	₹400
Microphone Module (KY-038)	For voice input	₹100
Speaker Module	For story audio output	₹150
RFID Reader Module (RC522)	For card reading	₹200
Servo Motor (SG90)	For head movement	₹100
LED Lights / RGB Eyes	For animation effect	₹50
Power Source (Battery)	5V rechargeable battery	₹150
Plastic/3D body / DIY Box	Robot casing	₹100

Total: ₹1200–₹1400 (approx.) ☑

◇ 4. Software & Tools

Tool	Purpose
Arduino IDE	Microcontroller coding
Python (optional)	For AI voice and story processing
Google Text-to-Speech (gTTS)	Convert text into audio
SpeechRecognition (Python library)	Voice command detection
IFTTT or OpenAI API	To connect with global AI (optional cloud feature)

◇ 5. System Flow Diagram (Concept)

```
🎤 User (Child) speaks
        ↓
🎧 Mic detects voice
        ↓
🤖 Arduino processes input
        ↓
📖 If RFID Card detected → play selected story
        ↓
💬 Otherwise, connect to AI for answers
        ↓
🔊 Output voice through speaker
```

◇ 6. Core Features

Feature	Description
🗣️ **Voice Interaction**	Child can talk with robot; robot answers back
📚 **Storytelling Mode**	Reads stories when a specific card is scanned
💡 **LED Expression**	Robot eyes blink during conversation
🌐 **AI Connection**	Can answer basic questions using OpenAI or online API
🧠 **Offline Story Mode**	Preloaded stories for when internet is off

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◇ 7. Coding Part (Sample Structure)

A. Arduino Side (main controller):

```
#include <SPI.h>
#include <MFRC522.h>
#include <SoftwareSerial.h>
```

```
#define RST_PIN 9
#define SS_PIN 10
MFRC522 mfrc522(SS_PIN, RST_PIN);

void setup() {
  Serial.begin(9600);
  SPI.begin();
  mfrc522.PCD_Init();
  pinMode(8, OUTPUT);
  Serial.println("AI Robot Ready...");
}

void loop() {
  if ( ! mfrc522.PICC_IsNewCardPresent()) return;
  if ( ! mfrc522.PICC_ReadCardSerial()) return;

  String story = "default";
  if (mfrc522.uid.uidByte[0] == 0xA1) story = "rabbit_story";
  else if (mfrc522.uid.uidByte[0] == 0xB2) story = "lion_story";

  Serial.println(story);  // send to Python to speak
  digitalWrite(8, HIGH);
  delay(1000);
  digitalWrite(8, LOW);
}
```

B. Python Side (AI + Voice):

```
import serial
import pyttsx3
from gtts import gTTS
import os
import openai

ser = serial.Serial('COM3', 9600)
openai.api_key = "YOUR_OPENAI_API_KEY"

def tell_story(story):
    if story == "rabbit_story":
        text = "Once upon a time, a rabbit lived in a forest..."
    elif story == "lion_story":
        text = "A brave lion ruled the jungle..."
    else:
        text = "Hello! What story do you want to hear today?"
    tts = gTTS(text)
    tts.save("story.mp3")
    os.system("start story.mp3")

while True:
    data = ser.readline().decode().strip()
    if data:
        tell_story(data)
```

◇ 8. Output (Expected Behavior)

☑ When robot is powered on → greets the user
☑ When a card is scanned → tells a specific story

☑ When child says “Tell me a story” → plays a random story
☑ When child asks a question → connects to AI and answers it
☑ Eyes blink and mouth LED glows while speaking

◇ 9. Future Upgrade Ideas

1. Add **Bluetooth or Wi-Fi control via mobile app**
2. Use **ESP32 with inbuilt mic & speaker** for smoother performance
3. Add **motion sensors** so robot can follow sound or move its head
4. Add **face recognition** for personalized storytelling
5. Add **emotion detection** to respond differently to child’s tone

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◇ 10. Summary

Parameter	Detail
Type	AI Storytelling Robot
Budget	₹1000–₹1500
Control System	Arduino + Python
Input	Voice + RFID Card
Output	Audio Story + LED animation
Special Feature	Connects to global AI for answers