INTRODUCTION TO ROBOTICS

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1. Introduction to robotics

Scene 1: Garden

Chikki and Mitthu walked through the garden, soaking in the fresh air. Suddenly, curiosity struck Chikki, and she turned to her elder brother with a burning question. And here starts an interesting conversation.

Chikki: "Bhaiya(brother), what's a robot?"

Mitthu: "Oh, Chikki! I'm happy you asked. A robot is like a super-smart machine. It is designed to do specific tasks for humans. It's got both hardware, which is the physical stuff, and some smart instructions given through programming, called software. Basically, robots are our helpers—they do repetitive jobs faster and better than we can."

Chikki: "Hmm, interesting. Are they the ones we see in movies, you know, those weird human-like robots?"

Mitthu: "Not always, Chikki. They come in all shapes and sizes. And not every amazing task-performing thing is a robot. Let me break it down for you."

They found a bench near a rose plant and sat down.

Mitthu: "Okay, Chikki, think about our washing machine at home. What does it do?"

Chikki: "Well, you put in dirty clothes, add some washing powder, and it gives you clean clothes after a while."

Mitthu: "Exactly! Now, imagine washing all those clothes by hand. How long would it take?"

Chikki: "Hmm, a lot longer. Maybe 2 to 3 hours*?"

Mitthu: "Bingo! The washing machine is doing a human-like task—washing clothes—but way faster and easier. Even it takes the water by its own, and the clothers are almost dried when it completes the cycle. So, can we call it a robot?"

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Chikki: "I guess so!"

Mitthu: "And get this, some washing machines today are so smart. They can even order washing powder when they run out, thanks to the Internet of Things. But that's a topic for another day. Ready to head home?"

Chikki: "Wait, one more thing. Does a robot need computers or humans to do its thing?"

Mitthu: "Well, it depends. Robots can be controlled by computer programs, humans, or even pre-set commands. It's a mix of yes and no."

Chikki: "Got it. Let's go home. Since it's Sunday, how about watching the 'Robot' movie?"

Mitthu: Why not? That's great idea.! Let's go.

They both laughed & headed back to home.

Chikki's notebook

A robot is a machine that does specific tasks for us in speedy manner. It may or may not need human intervention to do a specific job. It may or may not be operated by a computer program. A robot would do the tasks with at least some level of autonomy. If it's a machine with zero autonomy it's just a machine and not a robot. In other words, robots need to have at least a certain level of "intelligence" to do the tasks.

It may or may not look like a human or other animal. Basically, any machine followed by the given category that solves real-life problems can be considered as robot. Like the washing machine, a simple alarm that wakes you up, or those automatic doors at the mall—they're all examples of robots.

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Scene 2: Dinner table - Home

It is Sunday night. Chikki & Mitthu have just finished the movie. They, along with their father & grand-parents waiting for delicious puri-bhaji that her mother is making.

Chikki: "Dadaji, do you know we have robots at home."

(Grand father)

Dadaji: "Robots? At home?"

Chikki: "Yes. Robots are the machines that do our tasks fast and with efficiency. And so the washing machine is a robot at our home."

Dadaji: "Nice Chikki. Who taught you this?"

Chikki: "Bhaiya told me all these when we were at the garden today."

(Father)

Papa: "So Chikki, you must have known why the robots are important?"

Chikki: "Yes. Because they can do repetitive tasks with maximum accuracy, and in a faster way and...(thinking) Bhaiya, am I missing anything?"

Mitthu: "No Chikki. You are absolutely right. I like to add that robots can do multiple jobs together."

Chikki: "Just a way mummy makes puri(an Indian bread) from dough and frying it simultaneously?"

Everyone smiles.

Papa: "Probably yes.. Not only that, robots can learn and execute the task once programmed. They have memories for a lifetime."

Chikki & Mitthu looking at each other with amaze!

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Chikki: "Wow.."

Mummy: "The dinner is ready...!"

Everyone enjoy delicious puri-bhaji

Scene 3: Drawing room - Home

Post dinner, Chikki is sitting with Mitthu and their parents. Suddenly, her mother asks, and here is how it went.

Mummy: "Alexa, please play Hanuman Chalisa(Indian chants)."

Chikki: "Bhaiya, is Alexa a robot?"

Mitthu: "That's a smart question, Chikki! Yes, assistants like Alexa, ChatGPT, Meta AI, Copilot and Google Home can be considered robots. They assist us, guide us, and fulfill our requests or answer our questions."

Chikki: "What are some other application areas of robots that we use in daily life?"

Mitthu: "Why don't you ask Alexa after Hanuman Chalisa finishes?"

Chikki: "Yeah. Okay"

(After a few minutes)

Chikki: "Alexa, please give me examples of robotics application in daily life."

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Alexa

"Here are some areas where robots are used in daily life:

1. Assistance: Virtual assistants help answer our daily questions, control smart home devices, and send alerts in emergency situations.
2. Entertainment: Robots and AI are shown in various movies and games for entertainment.
3. Household & Home Automation: Smart appliances like washing machines, ovens, and vacuum cleaners are all examples.
4. Industrial Robots: From manufacturing to dispatch, many industries use automated machines—these are industrial robots.
5. Medical: Robotic surgeries! Yes, robots in the medical field reduce human error and improve precision (under medical supervision).
6. Defense: In defense and military, robots are used to monitor enemy zones, launch missiles, and more."

Chikki

"She explained it so nicely! But Papa, can you explain what industrial robots are?"

Papa

"Sure! Think about any big industry—let's say chocolate making. What do you prefer: Dairy Milk, KitKat, or Munch?"

Chikki

(eyes glittering) "Dairy Milk!"

Papa

"So, from mixing milk and cocoa powder to packing multiple bars into a box—everything is automated. A person sets the quantity and settings on the machine, and the machine does all the work."

Chikki

"One day, let's visit and see this process! Bhaiya, I was thinking of making a robot. Let's build one that can talk to us."

Mitthu

(Smiling) "Chikki, anything you want to build should start from the basics. First, you need to learn the fundamentals—electronics, mechanics, and logic."

Chikki

"Then how do I start?"

Mitthu

"I have an idea! Let's order the Havi Elements – DIY Robotics Starter Kit. It's perfect kit to kickstart your robotics journey."

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Chikki: "Thank you, Bhaiya! We'll build amazing robotics creations with it!"

Mitthu: "Sure... you can try over 100+ projects!"

Chikki: "Wow! Let's order it now!"

They visited www.havi.co & order DIY Robotics Starter Kit.

Chikki's notebook

We have so many chatbot robots around us. They are alexa, chatGPT, Copilot, Meta AI, Google home etc. We can ask them questions and they will give us answers. They are helpful.

There are various areas in which robots are working. Some examples are: Assistance, Entertainment, Education, Household & home automation, Industries, Medical, Defence etc.

Hard Words

- Hardware-a device that can be touchable
- Programming-set of instructions given to any device/computer
- Humanoid-something that looks like human
- Internet of Things-a technology that connects devices within same network
- AI-artificial intelligence
- Robotics-the study of robots

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Exercise

- Mark the sentence true or false

1. Robots always look like human   ☐ True   ☐ False

2. The study of robots is called robotics   ☐ True   ☐ False

3. Robotics help to promote a growth mindset   ☐ True   ☐ False

4. Alexa primarily used in industries to automate manufacturing process   ☐ True   ☐ False

- Answer the following:

1. Why kids should study robotics? Write down your views.

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2. Name the sectors in which robots are used in daily life.

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3. Mitthu ordered which kit to kick start Chikki's robotics journey?

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4. What is the definition of a robot?

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5. What should Chikki learn from scratch rather than directly making the robots?

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Discuss: Is a drone a robot? Yes or No and why?