- **The best actuator used in robot arm is servo motor**

- **Servo motor :**
- It’s type of motors which works with DC voltage. It sends feedback of angle it’s rotor moves so you can control it’s motion by angles.

- **Why we are using servo motor?**

1. Accurate position control as it has feedback.
2. High output power relative to motor size and power.
3. High efficiency.
4. It can be operated as high speed.

- **Types of servo motors :**

• Specification:

(A) SG90

- Working torque: 1.4kg/cm (4.8V)
- Operating speed of 0.12s/60º (4.8V)
- Operating voltage of 4.8V ~ 6V
- Dead band width of 7 µs
- Degree: 180 / 360
- Temperature range of -30ºC - 60ºC
- Connector type: JR, FUTABA compatible
- Pinout: Signal (yellow), VCC (red), GND (black)

(B) MG90S

- Working torque: 2kg/cm (4.8V)
- Operating speed of 0.11s/60º (4.8V)
- Operating voltage of 4.8V ~ 6V
- Dead band width of 5 µs
- Degree: 180
- Temperature range of 0ºC - 55ºC
- Connector type: JR, FUTABA compatible
- Pinout: Signal (yellow), VCC (red), GND (black)

(C) MG996R / MG995

- Operating torque: 9kg/cm (4.8V), 11kg/cm (6V)
- Operating speed of 0.19s/60º (4.8V), 0.18s/60º (6V)
- Operating voltage of 4.8V-7.2 V
- Dead band width of 5 µs
- Working current: 1.45A
- Degree: 180 / 360
- Temperature range of 0ºC-55 ºC
- Connector type: JR, FUTABA compatible
- Pinout: Signal (yellow), VCC (red), GND (black)

- **Comparison between servo motor sg90**

Shops	Type	Degree	Tourqe	Price	Notes
Ram	Sg90	180	1.8 kg .cm	120 LE	9 g
Free electronics	Sg90	Didn't mention	Didn't mention	120 LE	
Future electronics	Sg90	Didn't mention	1.3 kg.cm	95 LE	9 g 4.8 – 6 v
Uge one	Sg90	180 _ 360	1.6 kg.cm	85 LE 155 LE	Chinese 4.8 – 6 v

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- **Comparison between servo motor mg90s**

Shops	Type	Degree	Tourqe	Price	Notes
Ram	MG90S	360	2.2 – 2.6 kg.cm	225 LE	4.8 – 6 v
Free electronics	MG90S	Didn't mention	Didn't mention	175 LE	Continuous And Non
Future electronics	MG90S	_____	_____	_____	_____
Uge one	MG90S	360	1.8 kg.cm	100 LE	Continuous and Non 13.4 kg Chinese

- **Comparison between servo motor mg966r**

Shops	Type	Degree	Tourqe	Price	Notes
Ram	MG966R	180	11 kg.cm	225 LE	55 g
Free electronics	MG966R		Didn’t mention	270 LE	
Future electronics	MG966R	_____	_____	_____	_____
Uge one	MG966R	_____	_____	_____	_____

- **Comparison between servo motor mg995**

Shops	Type	Degree	Tourqe	Notes
Ram	MG995	180	10 kg.cm	69 g
Free electrons	MG995	Didn’t mention	11 kg.cm	Continuous and Non
Future electronics	MG995	_____	_____	_____
Uge one	MG995	Didn’t mention	13 kg.cm	69 g

- **Arduino**

- **Comparison between Arduino R3**

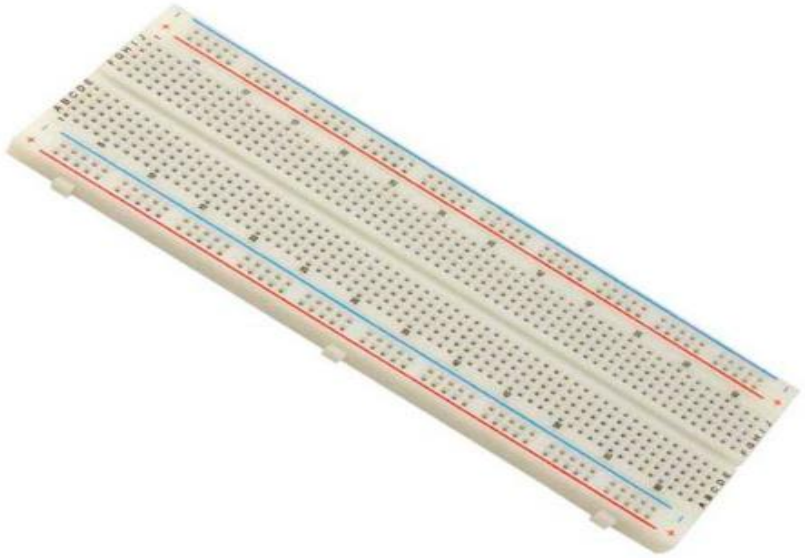
Shops	Type	price
Ram	_____	____
Free electronics	Arduino R3	450 LE
Future electonics	Arduino R3	495 LE
Uge one	Arduino R3	575 LE

- **Joystick**

- **Comparison between joysticks**

Shops	Type	Price
Ram	Joystick	50 LE
Free electronics	Joystick	45 LE
Future electronics	Joystick 4d	85 LE
Ugy one	Joystick 10 k With press sw	30 LE

- **Breadboard**



Shops	Type	Price
Ram	Breadboard 830 tie point	40 LE
Free electronics	Breadboard 400 tie point	30 LE
Future electronics	Breadboard 840 pin	65 LE
Ugy one	Breadbroad high quality 830 pins	75 LE