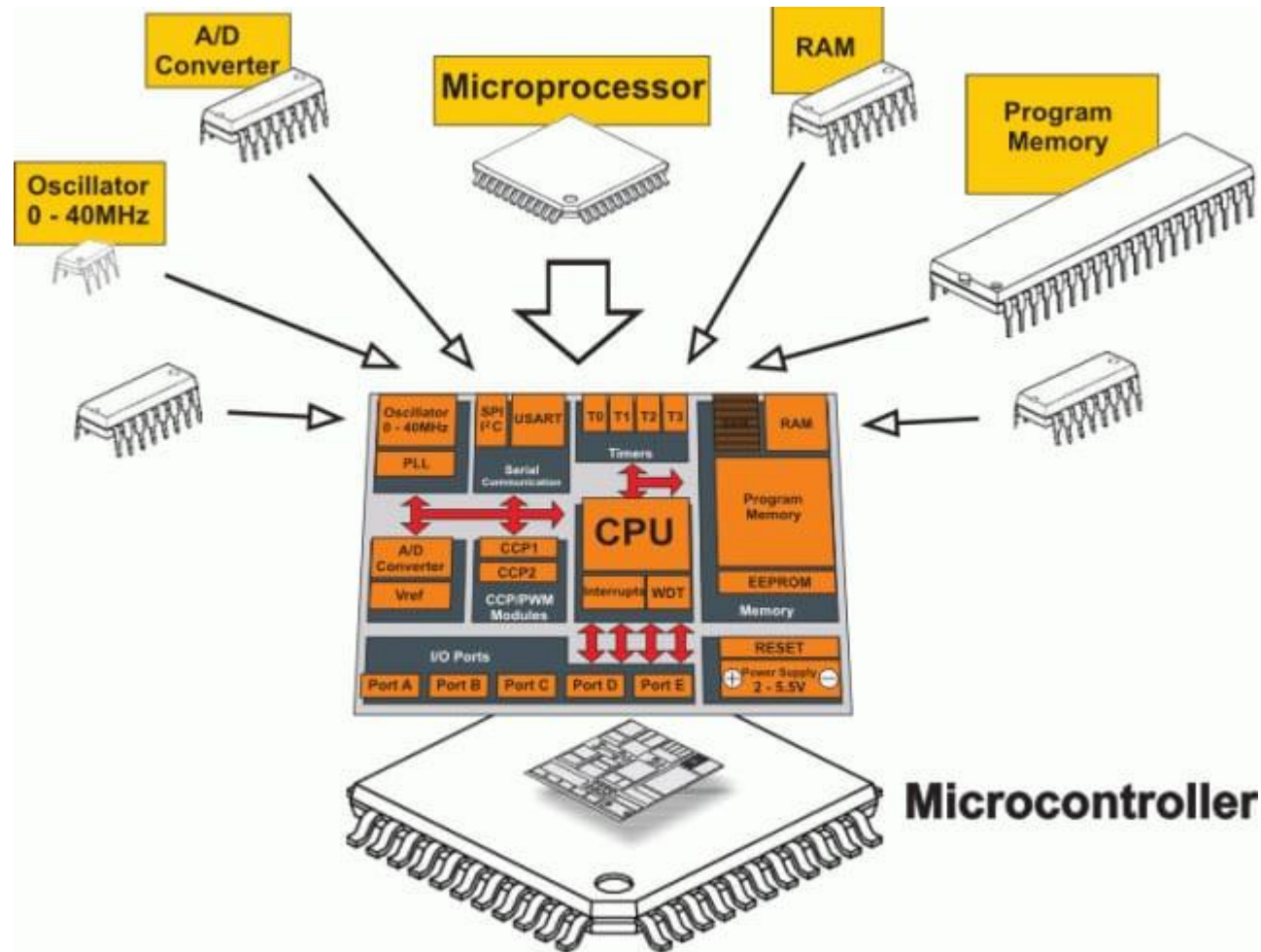




# GÖMÜLÜ SİSTEMLER -3

GÖMÜLÜ SİSTEM ARAÇLARI  
MİKRODENETLEYİCİLER

# Mikrodenetleyici - Microcontroller



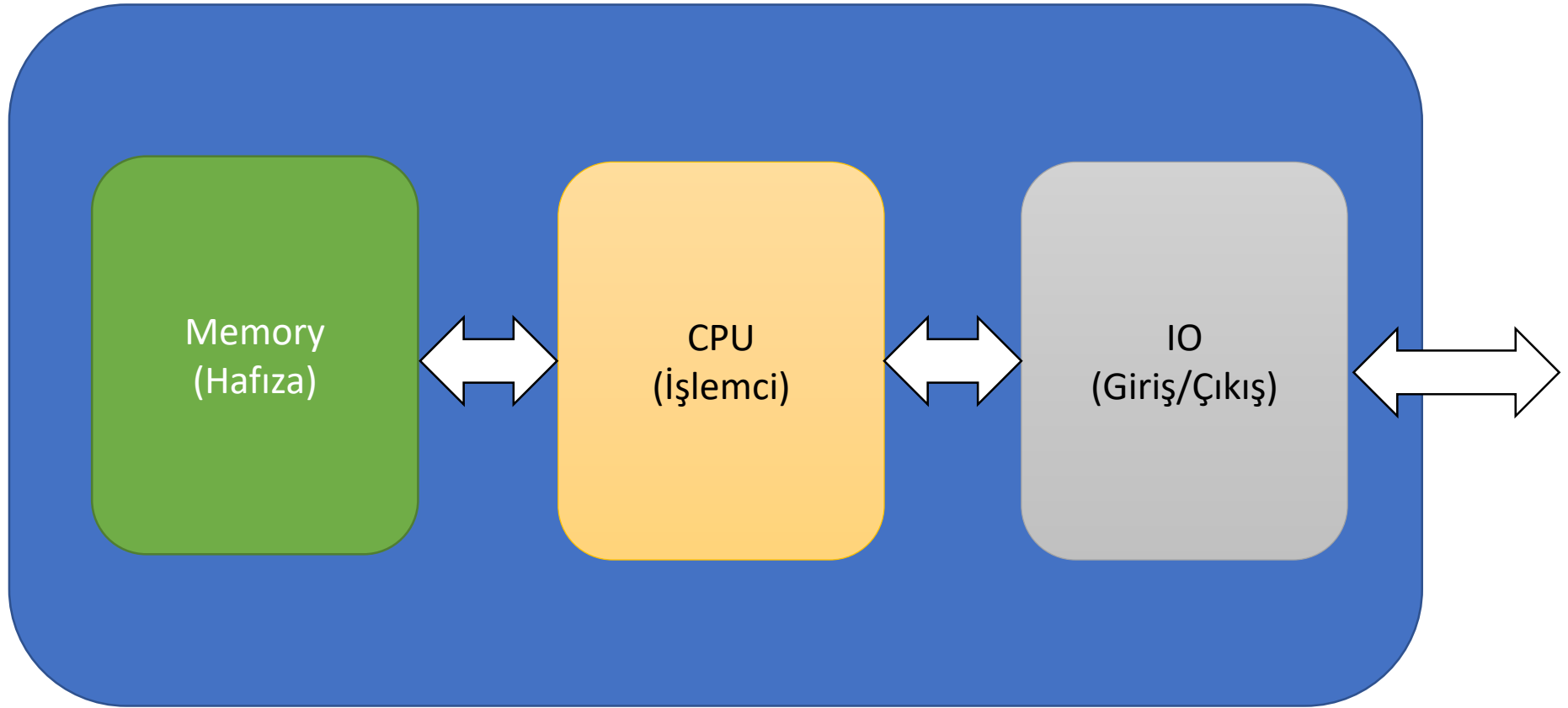


Mikrodenetleyici = Mikro Bilgisayar = Microcontroller

MCU = Micro Controller Unit

**!Tek Çip İçerisinde Bilgisayar!**

# Bilgisayar Sistemi

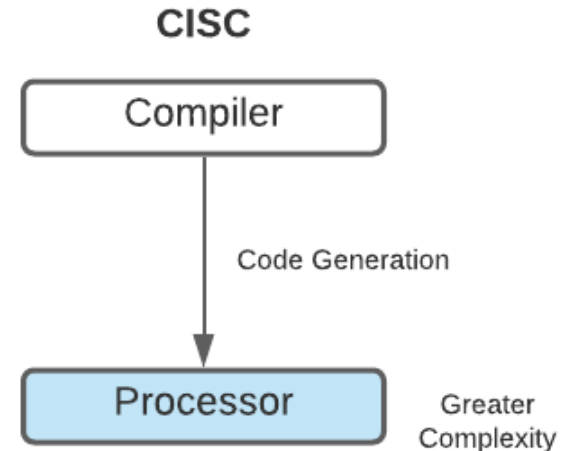
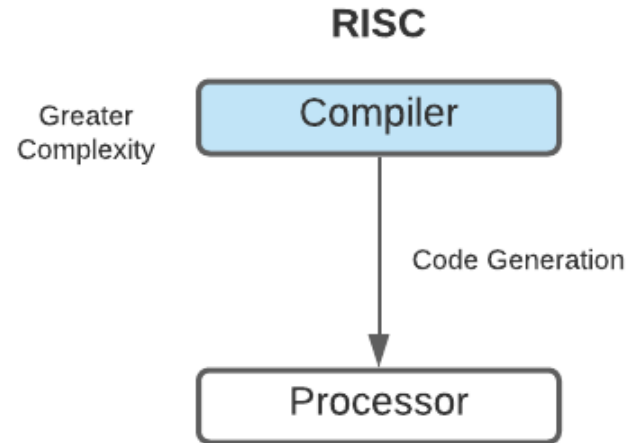
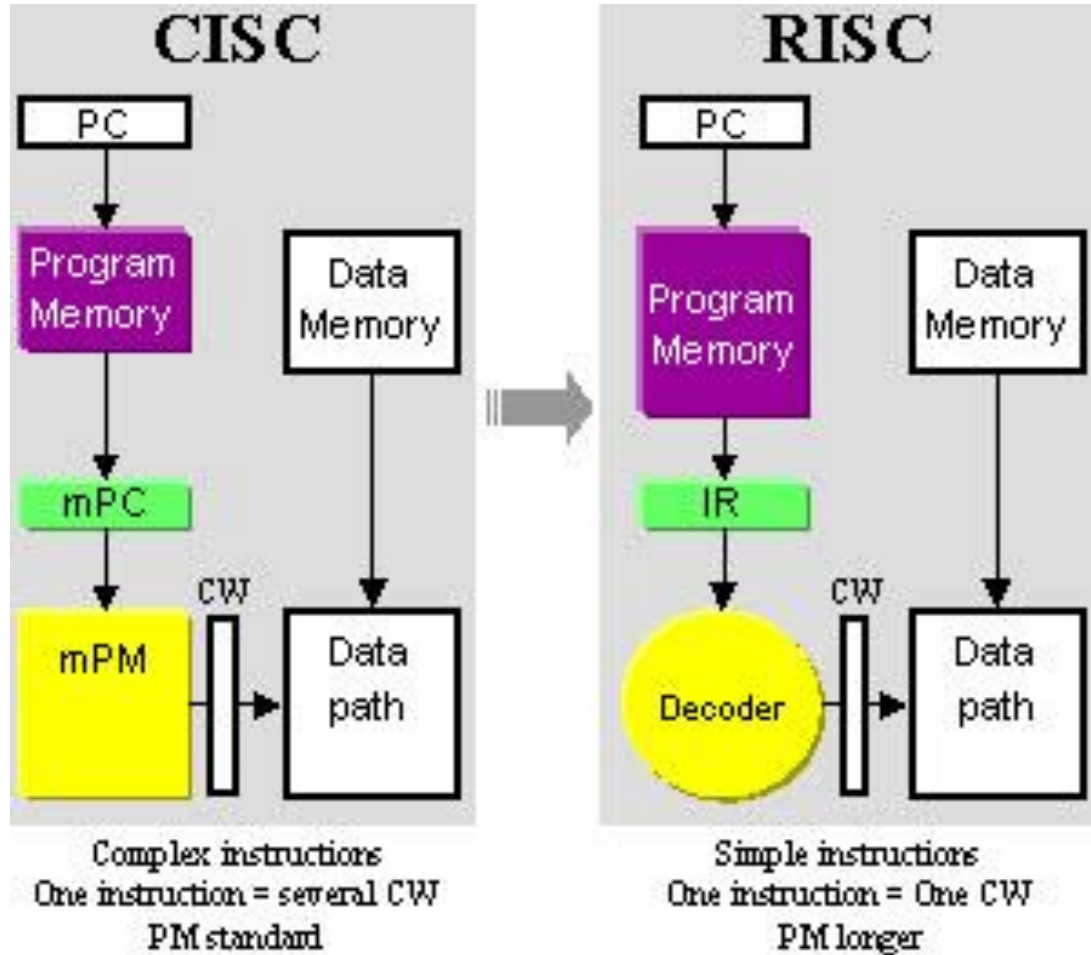


# Bilgisayar & Mikrobilgisayar

Kategori	Bilgisayar	Mikrobilgisayar (Mikrodenetleyici)
CPU - Hız	2 Ghz	16 Mhz
CPU – Komut Seti	~400	130
RAM	4 GB	2 KB
MEMORY	500 GB	32 KB
I/O	Klavye, Fare, Ethernet, PCI, AGP, USB, PS2, ...	RS232, I2C, SPI, USB, Ethernet

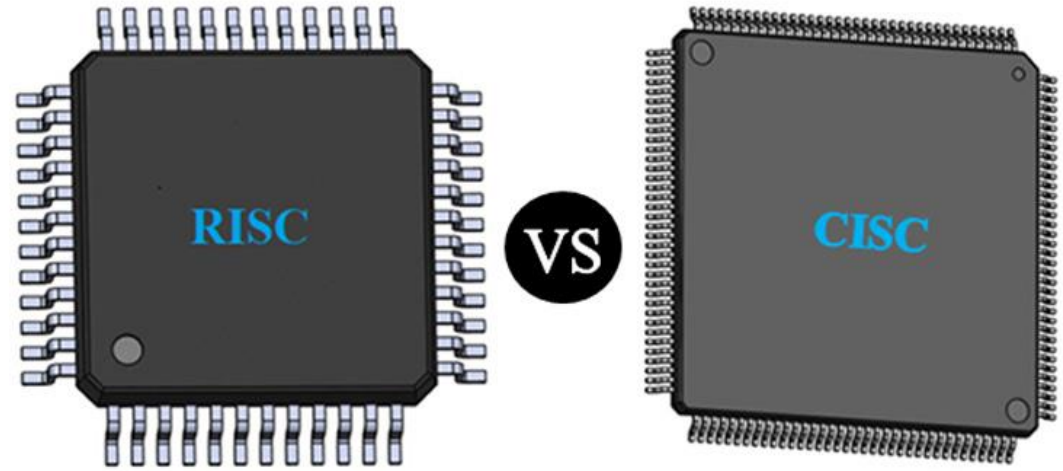


# Komut Setine Göre Bilgisayar Mimarisi



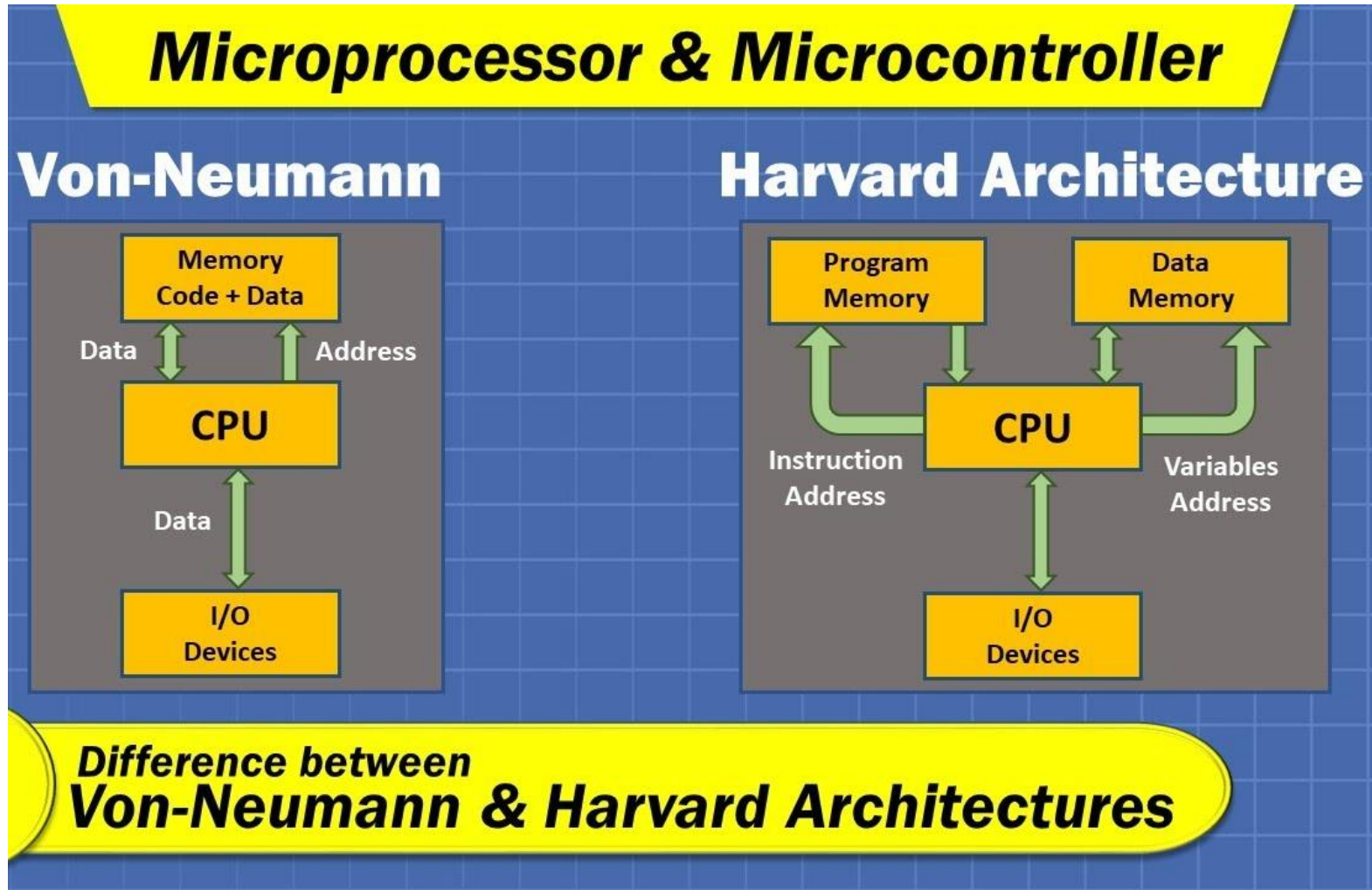


# Komut Setine Göre Bilgisayar Mimarisi



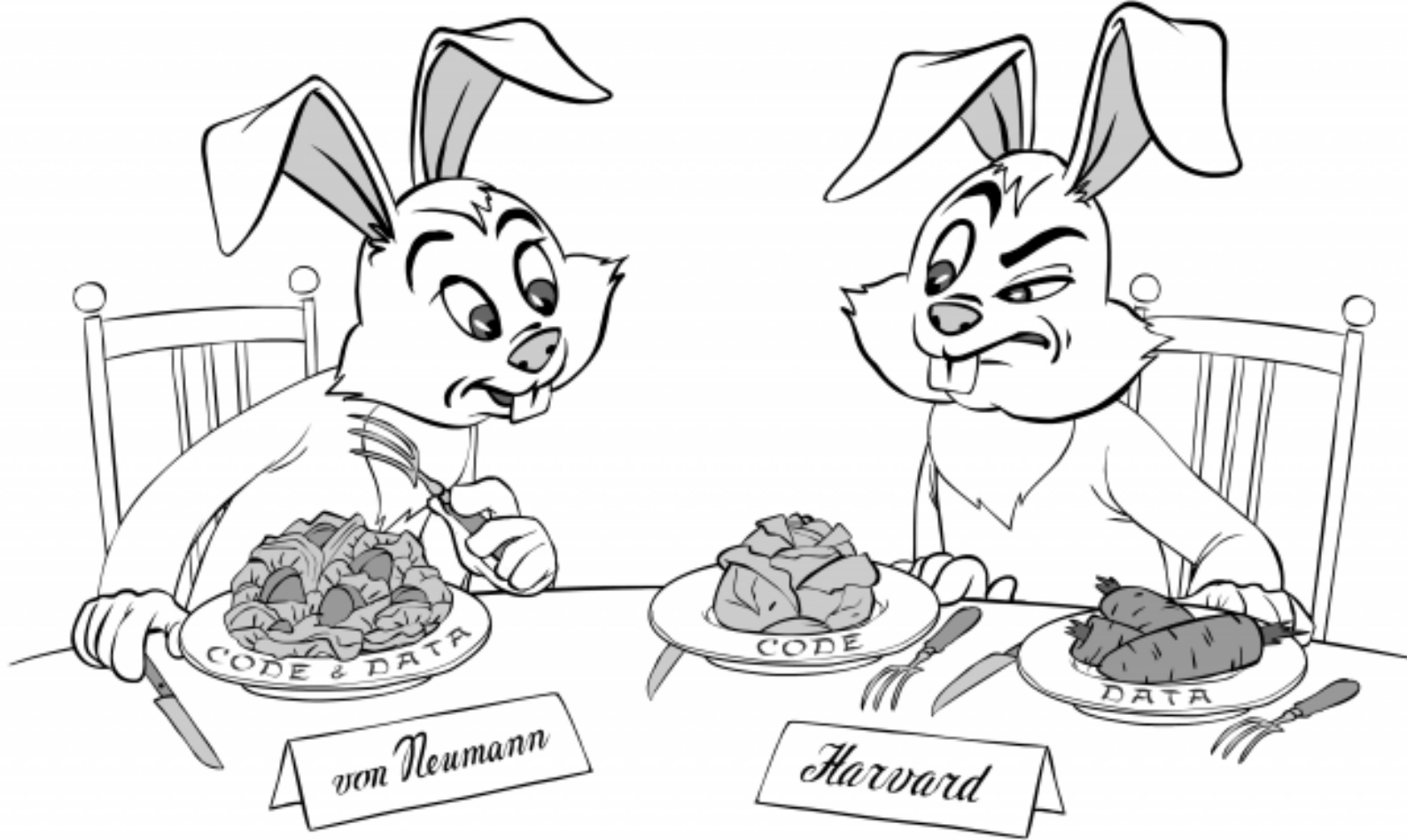
CISC	RISC
<ul style="list-style-type: none"><li>Emphasis on hardware</li></ul>	<ul style="list-style-type: none"><li>Emphasis on software</li></ul>
<ul style="list-style-type: none"><li>Multiple instruction sizes and formats</li></ul>	<ul style="list-style-type: none"><li>Instructions of same set with few formats</li></ul>
<ul style="list-style-type: none"><li>Less registers</li></ul>	<ul style="list-style-type: none"><li>Uses more registers</li></ul>
<ul style="list-style-type: none"><li>More addressing modes</li></ul>	<ul style="list-style-type: none"><li>Fewer addressing modes</li></ul>
<ul style="list-style-type: none"><li>Extensive use of microprogramming</li></ul>	<ul style="list-style-type: none"><li>Complexity in compiler</li></ul>
<ul style="list-style-type: none"><li>Instructions take a varying amount of cycle time</li></ul>	<ul style="list-style-type: none"><li>Instructions take one cycle time</li></ul>
<ul style="list-style-type: none"><li>Pipelining is difficult</li></ul>	<ul style="list-style-type: none"><li>Pipelining is easy</li></ul>

# Hafıza Birimine Göre Bilgisayar Mimarisi



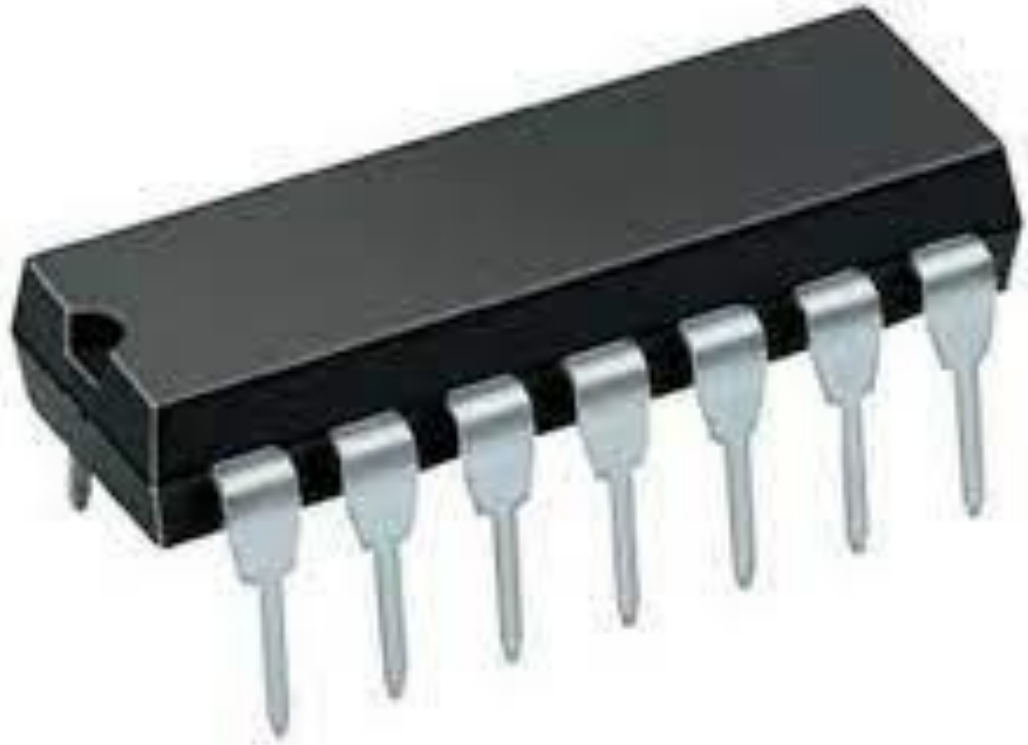


# Hafıza Birimine Göre Bilgisayar Mimarisi



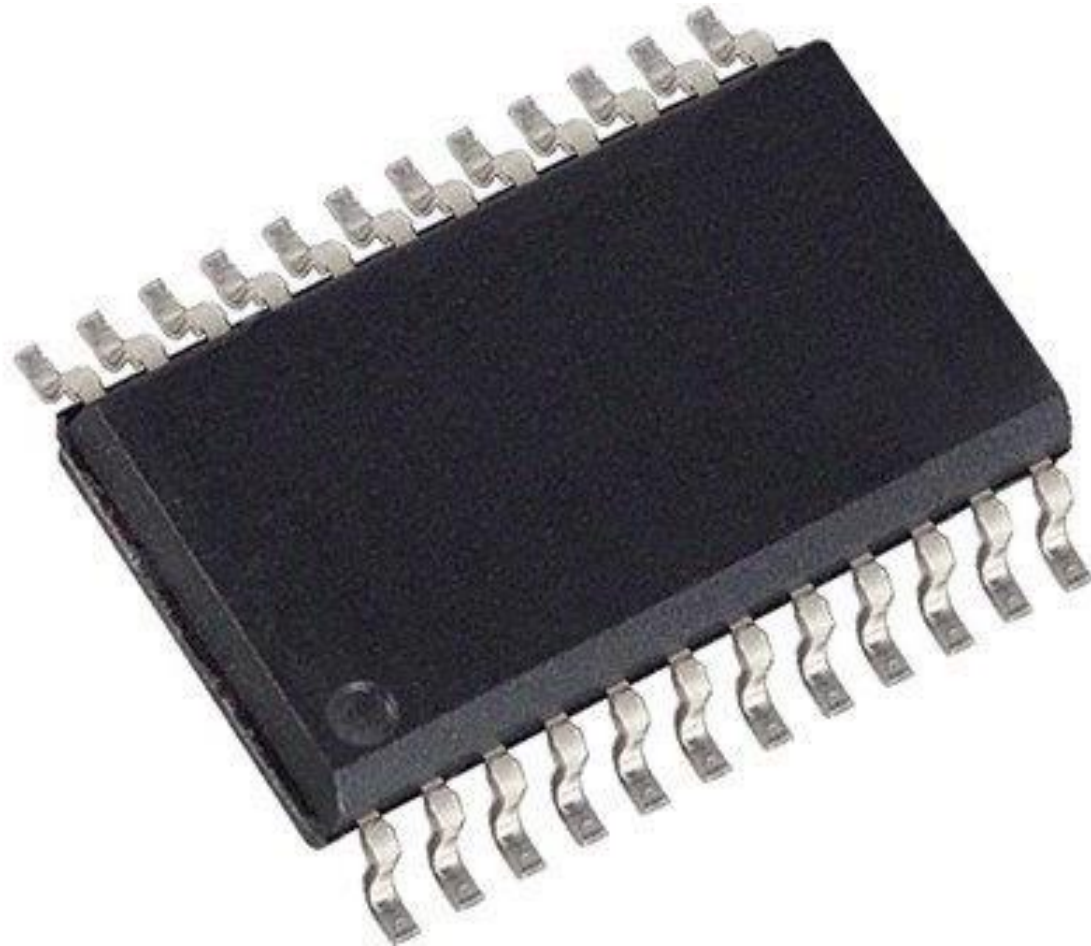
# Mikrodenetleyici Kılıfları (Package)

## DIP (Dual In Line Package)

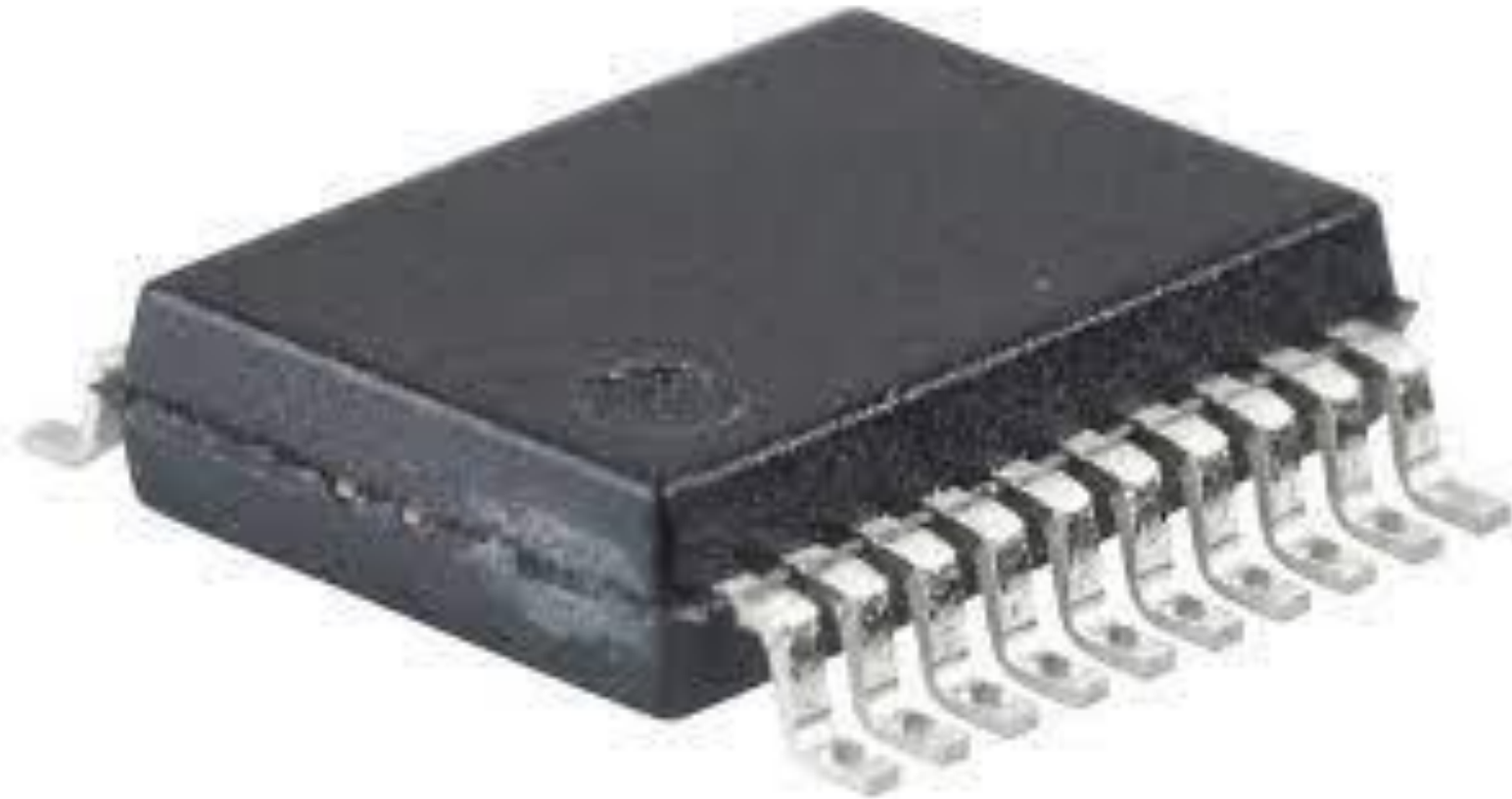


# Mikrodenetleyici Kılıfları (Package)

## SOIC (Small Outline Integrated Circuit)

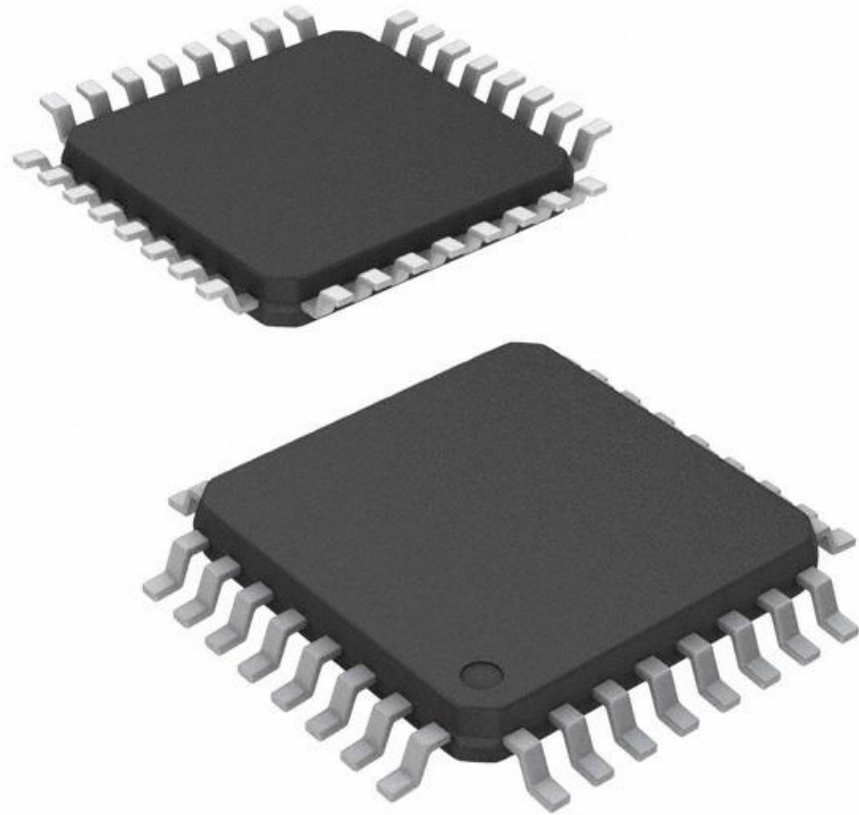


# Mikrodenetleyici Kılıfları (Package) SSOP (Shrink Small Outline Package)



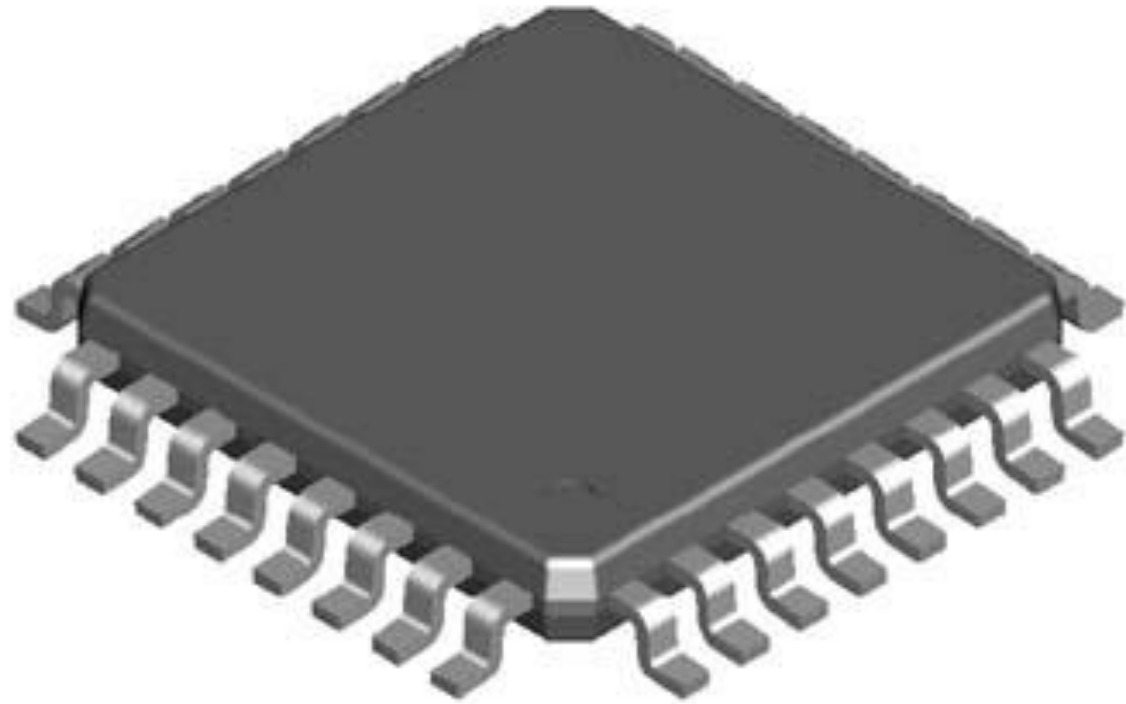
# Mikrodenetleyici Kılıfları (Package)

## LQFP (Low Profile Quad Flat Package)



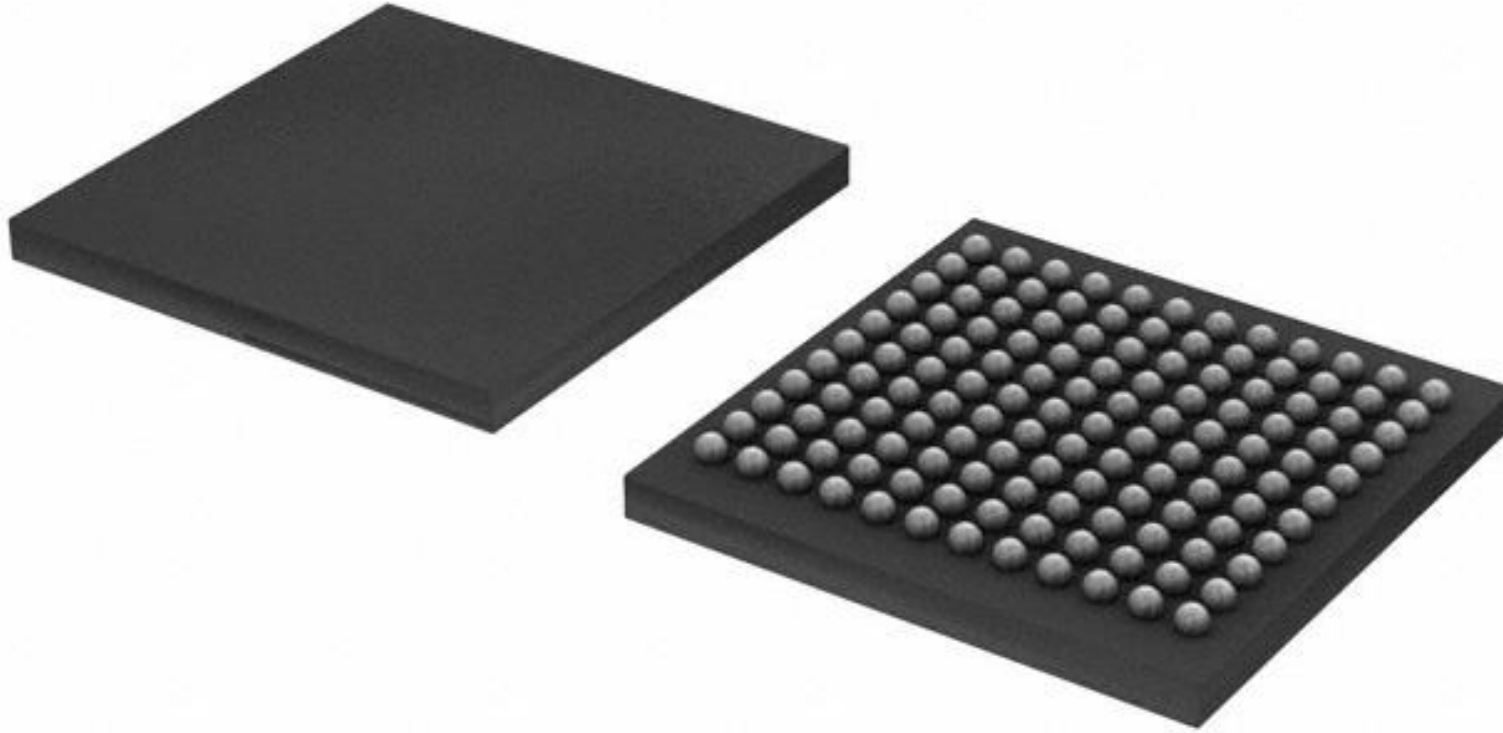
# Mikrodenetleyici Kılıfları (Package)

## TQFP (Thin Quad Flat Package)

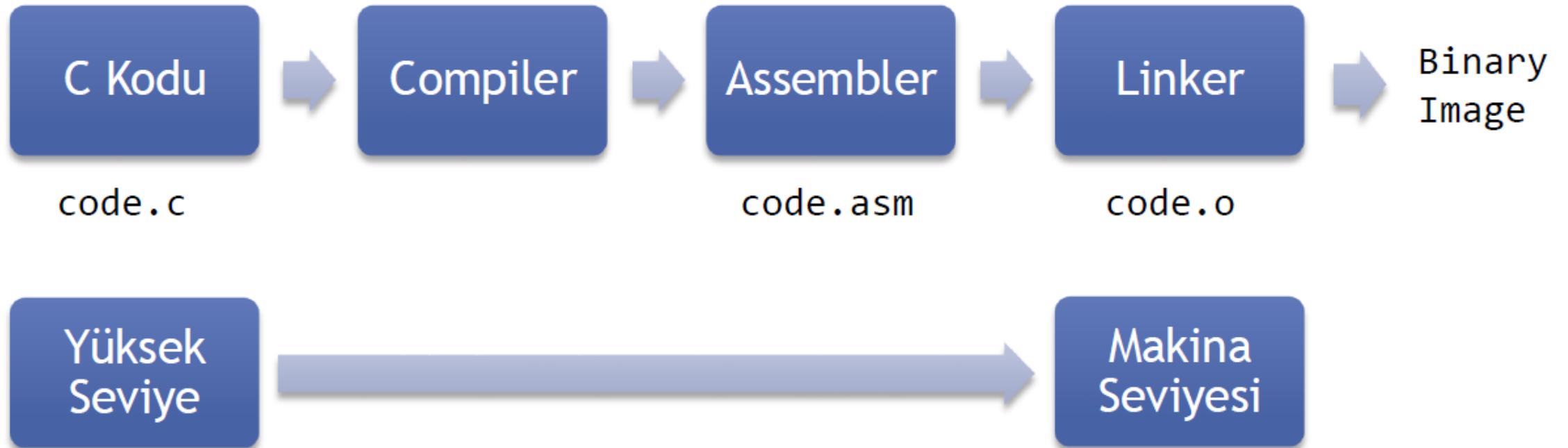


# Mikrodenetleyici Kılıfları (Package)

## BGA (Ball Grid Array)



# Mikrodenetleyici Programlama





# Mikrodenetleyici Programlama Araçları

- ❖ Tümüleşik Geliştirme Ortamı (IDE)
- ❖ Derleyici (Compiler)
- ❖ Hata ayıklama , Yazılım yükleme cihazı (Debugger)
- ❖ Emülatörler
- ❖ Test Yazılım ve Cihazları

# Basit bir Mikrodenetleyici Blok Diyagramı Microchip – PIC16F84A

