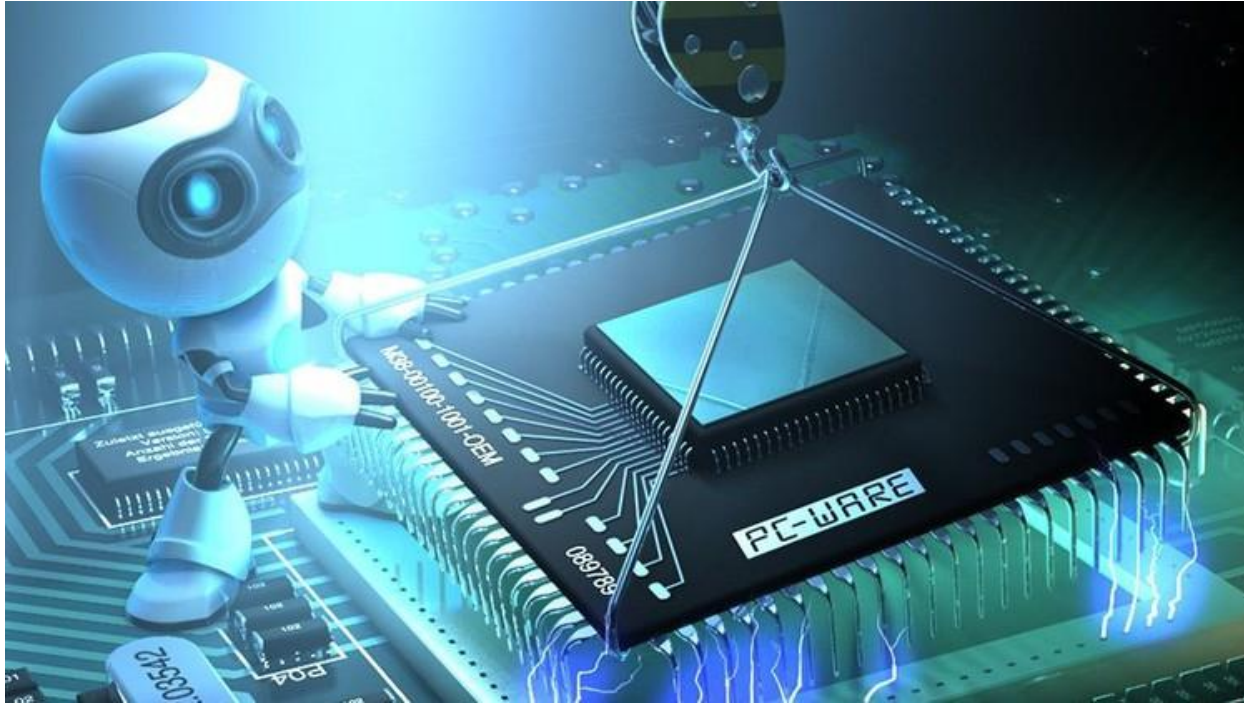
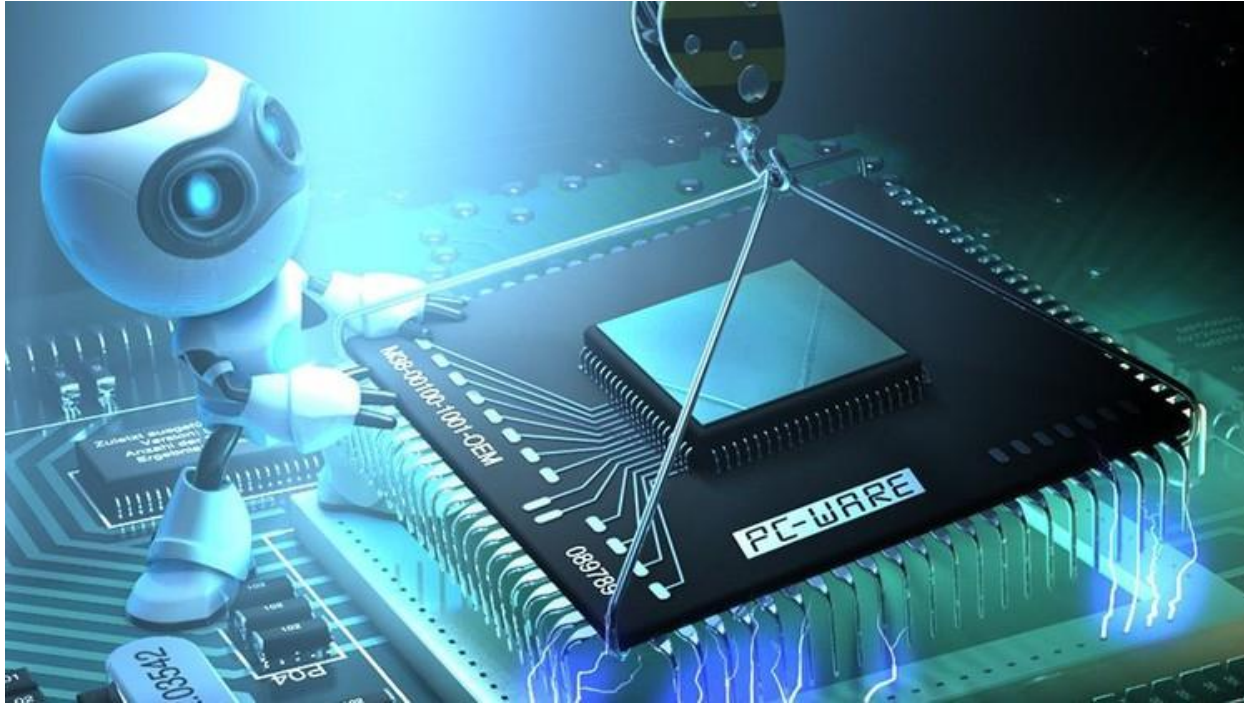


Exam 3



Exam 3 - Problem 1



Exam 3 - Problem 1



In the last exam, we programmed the `Xprob3` routine in x86 assembler that called the `Exa` routine. The following figure shows the C code of the `Xprob3` and `Exa` routines, and part of the x86 translation of the `Xprob3` routine:

```
int Exa(int v[], int x) {
    int i;
    i = v[x];
    return v[i];
}
int XProb3(int v[], int *p, int m){
    int i;
    for (i=0; i<1000000; i++)
        v[i] += Exa(v, *p);
    return *p + m;
}

Xprob3: ...
for:    movl 12(%ebp), %eax
        pushl (%eax)
        pushl %ebx
        call Exa
        addl $8, %esp
        addl %eax, (%ebx, %esi, 4)
        incl %esi
        cmpl $1000000, %esi
        jnl for
endfor: ...
```

Exam 3 - Problem 1



Translate the `Exa` subroutine to x86 assembler.

```
Exa: pushl %ebp
      movl %esp,%ebp
      movl 8(%ebp),%edx      # %edx = @v
      movl 12(%ebp),%ecx     # %ecx = x
      movl (%edx,%ecx,4),%eax # %eax = v[x]
      movl (%edx,%eax,4),%eax # %eax = v[i]
      movl %ebp, %esp
      popl %ebp
      ret
```