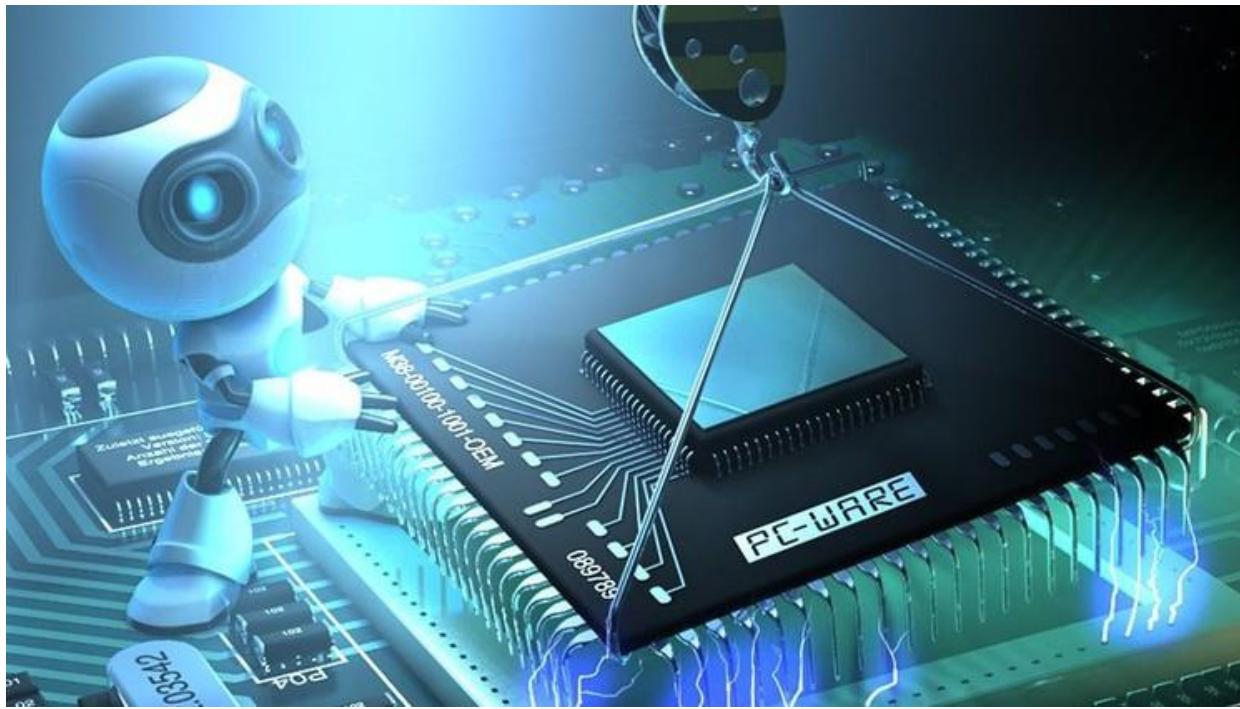
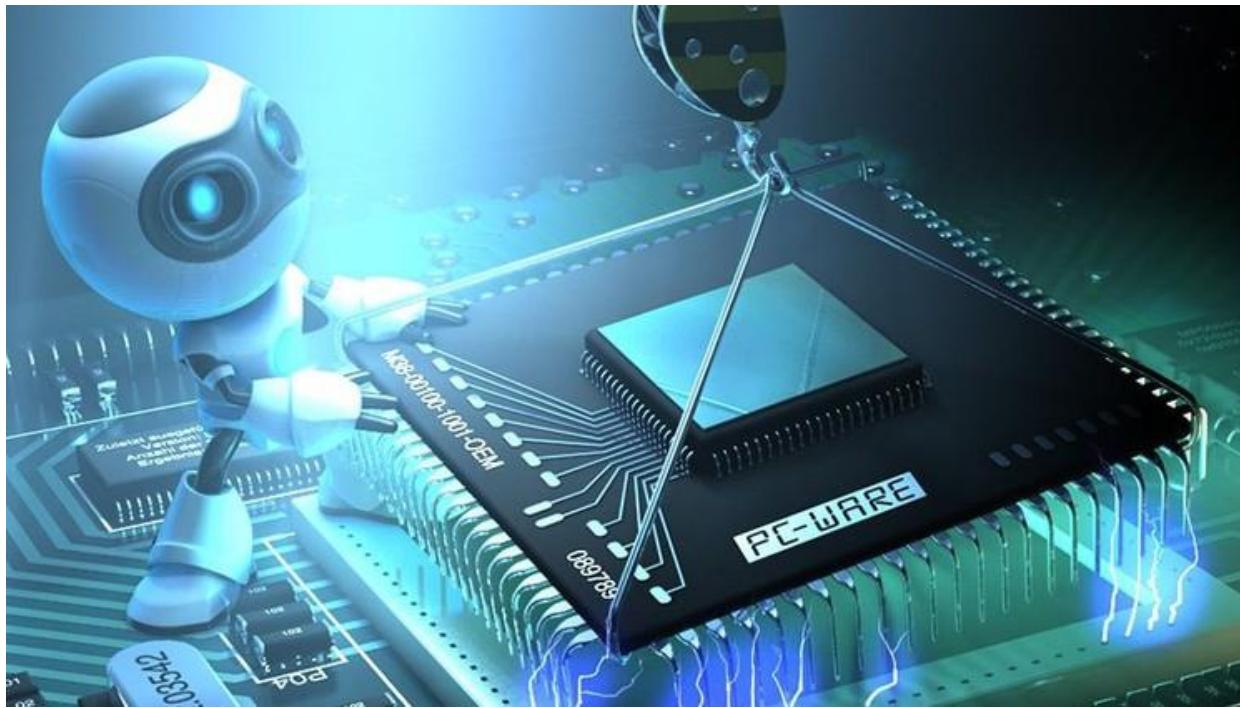


Exam 3



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:

<pre>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; }</pre>	<pre>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 jl for endfor: ...</pre>
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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
```