Министерство образования Республики Беларусь

Учреждение образования «Полоцкий государственный университет»

Факультет информационных технологий

Кафедра технологий программирования

**Лабораторная работа №4**

**По дисциплине «Программирование на языке ассемблера»**

**Тема: «Целочисленные арифметические операции и обработка**

**массивов числовых данных»**

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Группа 21ИТ1

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**Тема:** целочисленные арифметические операции и обработка

массивов числовых данных.

**Задание**

Ввести массив целых чисел размерностью 30 элементов. Подсчитать

число элементов, значения которых лежат в заданном диапазоне.

**Код:**

|  |
| --- |
| .model small |
|  |

|  |
| --- |
| .stack 100h |
|  |

|  |
| --- |
| .data |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| MaxArrayLength equ 30 |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| ArrayLength db ? |
|  |

|  |
| --- |
| InputArrayLengthMsgStr db 0Dh,'Input array length: $' |
|  |

|  |
| --- |
| InputLowerBoundMsgStr db 0Dh,'Input lower bound: $' |
|  |

|  |
| --- |
| InputHigherBoundMsgStr db 0Dh,'Input higher bound: $' |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| ErrorInputMsgStr db 0Dh,'Incorrect value!',0Ah, '$' |
|  |

|  |
| --- |
| ErrorInputHigherBoundMsgStr db 0Dh,'Higher bound should be geater than lower bound!', 0Ah, '$' |
|  |

|  |
| --- |
| ErrorInputArrayLengthMsgStr db 0Dh,'Array length should be geater than 0 and not grater than 30!', 0Ah, '$' |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| InputMsgStr db 0Dh,'Input ' |
|  |

|  |
| --- |
| CurrentEl db 2 dup(0) |
|  |

|  |
| --- |
| InputMsgStrEnding db ' element (-127..127) : $' |
|  |

|  |
| --- |
| enterStr db 0Ah, 0Dh, '$' |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| Answer db 2 dup(0) |
|  |

|  |
| --- |
| ResultMsgStr db 0Dh, 'Result: $' |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| Buffer db ? |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| MaxNumLen db 5 |
|  |

|  |
| --- |
| Len db ? ;Contains length of entered string |
|  |

|  |
| --- |
| buff db 5 dup (0) |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| minus db 0 |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| Array db MaxArrayLength dup (0) |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| LowerBound db ? |
|  |

|  |
| --- |
| HigherBound db ? |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| .code |
|  |

|  |
| --- |
| start: ; |
|  |

|  |
| --- |
| mov ax,@data ; |
|  |

|  |
| --- |
| mov ds,ax ; |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| xor ax,ax ; |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| call input ; |
|  |

|  |
| --- |
| call Do ; |
|  |

|  |
| --- |
| call output ; |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| input proc ; |
|  |

|  |
| --- |
| call inputLowerBound ; |
|  |

|  |
| --- |
| call inputHigherBound ; |
|  |

|  |
| --- |
| call inputArrayLength ; |
|  |

|  |
| --- |
| call inputArray ; |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| ret ; |
|  |

|  |
| --- |
| endp |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| inputLowerBound proc |
|  |

|  |
| --- |
| mov cx, 1 |
|  |

|  |
| --- |
| inputLowerBoundLoop: |
|  |

|  |
| --- |
| call ShowInputLowerBoundMsg |
|  |

|  |
| --- |
| call inputElementBuff |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| test ah, ah |
|  |

|  |
| --- |
| jnz inputLowerBoundLoop |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| mov bl, Buffer |
|  |

|  |
| --- |
| mov LowerBound, bl |
|  |

|  |
| --- |
| loop inputLowerBoundLoop |
|  |

|  |
| --- |
| ret |
|  |

|  |
| --- |
| endp |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| inputHigherBound proc |
|  |

|  |
| --- |
| mov cx, 1 |
|  |

|  |
| --- |
| inputHigherBoundLoop: |
|  |

|  |
| --- |
| call ShowInputHigherBoundMsg ; |
|  |

|  |
| --- |
| call inputElementBuff |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| test ah, ah |
|  |

|  |
| --- |
| jnz inputHigherBoundLoop |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| mov ah, LowerBound |
|  |

|  |
| --- |
| cmp Buffer,ah |
|  |

|  |
| --- |
| jnl inputHigherBoundLoop\_OK |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| call ShowErrorInputHigherBoundMsgStr |
|  |

|  |
| --- |
| jmp inputHigherBoundLoop |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| inputHigherBoundLoop\_OK: |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| mov bl, Buffer |
|  |

|  |
| --- |
| mov HigherBound, bl |
|  |

|  |
| --- |
| loop inputHigherBoundLoop |
|  |

|  |
| --- |
| ret |
|  |

|  |
| --- |
| endp |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| inputArrayLength proc |
|  |

|  |
| --- |
| mov cx, 1 |
|  |

|  |
| --- |
| inputArrayLengthLoop: |
|  |

|  |
| --- |
| call ShowInputArrayLengthMsg ; |
|  |

|  |
| --- |
| call inputElementBuff |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| test ah, ah |
|  |

|  |
| --- |
| jnz inputArrayLengthLoop |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| cmp Buffer, MaxArrayLength |
|  |

|  |
| --- |
| jg inputArrayLengthLoop\_FAIL |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| cmp Buffer, 0 |
|  |

|  |
| --- |
| jg inputArrayLengthLoop\_OK |
|  |

|  |
| --- |
| ;jmp inputArrayLengthLoop\_FAIL |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| inputArrayLengthLoop\_FAIL: |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| call ShowErrorInputArrayLengthMsgStr |
|  |

|  |
| --- |
| jmp inputArrayLengthLoop |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| inputArrayLengthLoop\_OK: |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| mov bl, Buffer |
|  |

|  |
| --- |
| mov ArrayLength, bl |
|  |

|  |
| --- |
| loop inputArrayLengthLoop |
|  |

|  |
| --- |
| ret |
|  |

|  |
| --- |
| endp |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| inputArray proc |
|  |

|  |
| --- |
| xor di,di |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| mov cl,ArrayLength |
|  |

|  |
| --- |
| inputArrayLoop: |
|  |

|  |
| --- |
| call ShowInputMsg ; |
|  |

|  |
| --- |
| call inputElementBuff |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| test ah, ah |
|  |

|  |
| --- |
| jnz inputArrayLoop |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| mov bl, Buffer |
|  |

|  |
| --- |
| mov Array[di], bl |
|  |

|  |
| --- |
| inc di |
|  |

|  |
| --- |
| loop inputArrayLoop |
|  |

|  |
| --- |
| ret |
|  |

|  |
| --- |
| endp |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| resetBuffer proc |
|  |

|  |
| --- |
| mov Buffer, 0 |
|  |

|  |
| --- |
| ret |
|  |

|  |
| --- |
| endp |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| inputElementBuff proc ; |
|  |

|  |
| --- |
| push cx ;save cx |
|  |

|  |
| --- |
| inputElMain: ; |
|  |

|  |
| --- |
| call resetBuffer ; |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| mov ah,0Ah ;Input command |
|  |

|  |
| --- |
| lea dx, MaxNumLen ; |
|  |

|  |
| --- |
| int 21h ;Input |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| mov dl,10 ;Ñèìâîë êîòîðûé íàäî âûâåñòè íà ýêðàí |
|  |

|  |
| --- |
| mov ah,2 ;Ôóíêöèÿ DOS âûâîäà ñèìâîëà |
|  |

|  |
| --- |
| int 21h ;Ïðåðûâàíèå äëÿ âûïîëíåíèÿ ô-öèè |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| cmp Len,0 ; |
|  |

|  |
| --- |
| je errInputEl ;If input is exmpty - exit |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| mov minus,0 ;Reset minus |
|  |

|  |
| --- |
| xor bx,bx ;Reset bx |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| mov bl,Len ; |
|  |

|  |
| --- |
| lea si,Len ; |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| add si,bx ; |
|  |

|  |
| --- |
| mov bl,1 ; |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| xor cx,cx ; |
|  |

|  |
| --- |
| mov cl,Len ; |
|  |

|  |
| --- |
| inputElLoop: ; |
|  |

|  |
| --- |
| std ;Óñòàíîâêà ôëàãà íàïðàâëåíèÿ äâèæåíèÿ ïî ìàññèâó |
|  |

|  |
| --- |
| lodsb ;Ñ÷èòàòü áàéò ïî àäðåñó DS:SI â AL |
|  |

|  |
| --- |
| ;Òåïåðü â al íàõîäèòñÿ òåêóùèé ñèìâîë |
|  |

|  |
| --- |
| call checkSym ;Ïðîâåðêà ÷èñëî ëè ýòî |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| cmp ah,1 ;Åñëè ah ñîäåðæèò 1, òî çíà÷èò ñèìâîë íå ïðîøåë êîíòðîëü checkSym è â ïðîöåññå åå âûïîëíåíèÿ ñòàë 1 |
|  |

|  |
| --- |
| je errInputEl ;Îáðàáàòûâàåì äàííóþ ñèòóàöèþ |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| cmp ah,2 ;Åñëè ah ïîñëå âûïîëíåíèÿ checkSym ñîäåðæèò 2, òî çíà÷èò áûë ââåäåí çíàê ìèíóñà, íåîáõîäèìà äàëüøåéíàÿ ïðîâåðêà |
|  |

|  |
| --- |
| je nextSym ; |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| sub al,'0' ;Åñëè ìû íàõîäèìñÿ íà ýòîì øàãó, òî â al ëåæèò ñèìâîë â äèàïàçîíå '0'..'9', îòíèìàåì '0' ÷òîáû ïîëó÷èòü åãî ÷èñëîâîå çíà÷åíèå |
|  |

|  |
| --- |
| mul bl ;Óìíîæîåì òåêóùóþ öèôðó íà ðàçðÿä |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| test ah,ah ;Ïîáèòîâîå and ñ èçìåíåíèåì ÒÎËÜÊÎ ôëàãîâ, ðåçóëüòàò íå ñîõðàíÿåòñÿ |
|  |

|  |
| --- |
| ;Ïðîâåðêà çíà÷åíèÿ ðåãèñòðà íà ðàâåíñòâî íóëþ, Åñëè ðàâíî íóëþ -> Îøèáîê íå âûÿâëåíî |
|  |

|  |
| --- |
| jnz errInputEl ;Åñëè íå íîëü - îøèáêà ââîäà |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| add Buffer,al ;Çàïèñûâàåì òåêóùóþ ÷àñòü ÷èñëà â ìàññèâ. Òèï 123 = 3 + 2\*10 + 1\*100 |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| jo errInputEl ;Åñëè åñòü ïåðåïîíåíèå |
|  |

|  |
| --- |
| js errInputEl ;Çíàê ðàâåí 1 |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| mov al,bl ;Â al çàãðóæàåì bl |
|  |

|  |
| --- |
| mov bl,10 ;Â bl 10 |
|  |

|  |
| --- |
| mul bl ;Óìíîæàåì al íà 10, ïåðåõîä íà ñëåäóþùèé ðàçðÿä ÷èñëà |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| test ah,ah ;Ïîáèòîâîå and ñ ôëàãàìè îïÿòü |
|  |

|  |
| --- |
| jz ElNextCheck ;Åñëè íóëü èëè ðàâíî |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| cmp ah,3 ;Åñëè ah !=3 îøèáêà ââîäà |
|  |

|  |
| --- |
| jne errInputEl ;Ò.ê. 0..2 ìû ïðîâåðèëè, 10^3 â 16ññ = 3xx, òî 10^3 åùå äîïóñòèìà, à èç 10^4+ íåò |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| ElNextCheck: ; |
|  |

|  |
| --- |
| mov bl,al ; |
|  |

|  |
| --- |
| jmp nextSym ; |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| errInputEl: ; |
|  |

|  |
| --- |
| call ShowErrorInputMsg ;Âûâîä ñîîáùåíèÿ îá îøèáêå ââîäà |
|  |

|  |
| --- |
| jmp exitInputEl ;Ïîïûòêà ââåñòè ÷èñëî çàíîâî |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| nextSym: |
|  |

|  |
| --- |
| xor ah, ah ; |
|  |

|  |
| --- |
| loop inputElLoop ; |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| cmp minus,0 ; |
|  |

|  |
| --- |
| je exitInputEl ; |
|  |

|  |
| --- |
| neg Buffer ; |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| exitInputEl: ; |
|  |

|  |
| --- |
| pop cx ;Âîññòàíàâëèâàåì cx |
|  |

|  |
| --- |
| ret ; |
|  |

|  |
| --- |
| endp |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| checkSym proc ; |
|  |

|  |
| --- |
| cmp al,'-' ;Åñëè ýëåìåíò ðàâåí ìèíóñó, òî äåëàåì âûâîä, ÷òî ìû ïûòàåìñÿ ââåñòè îòðèöàòåëüíîå ÷èñëî |
|  |

|  |
| --- |
| je minusSym ; |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| cmp al,'9' ; |
|  |

|  |
| --- |
| ja errCheckSym ;Åñëè ñèìâîë áîëüøå 9 - îøèáêà ââîäà |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| cmp al,'0' ; |
|  |

|  |
| --- |
| jb errCheckSym ;Åñëè ñèìâîë ìåíüøå 0 - îøèáêà ââîäà |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| jmp exitCheckGood ;Åñëè ñèìâîë - öèôðà - ïåðåõîäèì â exitCheckGood, ãäå ñáðàñûâàåì ìåòêó îøèáêè |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| minusSym: ; |
|  |

|  |
| --- |
| cmp si,offset Len ; |
|  |

|  |
| --- |
| je exitWithMinus ; |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| errCheckSym: ; |
|  |

|  |
| --- |
| mov ah,1 ;Incorrect symbol |
|  |

|  |
| --- |
| jmp exitCheckSym ; |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| exitWithMinus: ; |
|  |

|  |
| --- |
| mov ah,2 ; |
|  |

|  |
| --- |
| mov minus, 1 ;Óñòàíàâëèâàåì ìåòêó, ÷òî ÷èñëî îòðèöàòåëüíîå |
|  |

|  |
| --- |
| cmp Len, 1 ; |
|  |

|  |
| --- |
| je errCheckSym ;Åñëè ÷èñëî ñîñòîèò òîëüêî èç ìèíóñà ëèáî áûëè ââåäåíû 2+ ìèíóñà - îøèáêà ââîäà! |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| jmp exitCheckSym ; |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| exitCheckGood: ; |
|  |

|  |
| --- |
| xor ah,ah ;Ah = 0 |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| exitCheckSym: ; |
|  |

|  |
| --- |
| ret ; |
|  |

|  |
| --- |
| endp ; |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| ShowErrorInputMsg proc ;Âûâîä ñîîáùåíèÿ îá îøèáêå âûâîäà |
|  |

|  |
| --- |
| lea dx, ErrorInputMsgStr ; |
|  |

|  |
| --- |
| mov ah, 09h ; |
|  |

|  |
| --- |
| int 21h ; |
|  |

|  |
| --- |
| ret ; |
|  |

|  |
| --- |
| endp ; |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| ShowInputArrayLengthMsg proc |
|  |

|  |
| --- |
| push ax |
|  |

|  |
| --- |
| push dx |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| mov ah,09h |
|  |

|  |
| --- |
| lea dx, InputArrayLengthMsgStr |
|  |

|  |
| --- |
| int 21h |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| pop ax |
|  |

|  |
| --- |
| pop dx |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| ret |
|  |

|  |
| --- |
| endp |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| ShowInputLowerBoundMsg proc |
|  |

|  |
| --- |
| push ax |
|  |

|  |
| --- |
| push dx |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| mov ah,09h |
|  |

|  |
| --- |
| lea dx, InputLowerBoundMsgStr |
|  |

|  |
| --- |
| int 21h |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| pop ax |
|  |

|  |
| --- |
| pop dx |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| ret |
|  |

|  |
| --- |
| endp |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| ShowInputHigherBoundMsg proc |
|  |

|  |
| --- |
| push ax |
|  |

|  |
| --- |
| push dx |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| mov ah,09h |
|  |

|  |
| --- |
| lea dx, InputHigherBoundMsgStr |
|  |

|  |
| --- |
| int 21h |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| pop ax |
|  |

|  |
| --- |
| pop dx |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| ret |
|  |

|  |
| --- |
| endp |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| ShowInputMsg proc ; |
|  |

|  |
| --- |
| mov ax,di ;di contains num |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| mov ax, di |
|  |

|  |
| --- |
| mov bl, 10 |
|  |

|  |
| --- |
| div bl |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| push di |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| xor di, di |
|  |

|  |
| --- |
| inc di |
|  |

|  |
| --- |
| mov CurrentEl[di], ah |
|  |

|  |
| --- |
| add CurrentEl[di], '0' |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| test al, al |
|  |

|  |
| --- |
| jz lessThanTen |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| dec di |
|  |

|  |
| --- |
| mov CurrentEl[di], al |
|  |

|  |
| --- |
| add CurrentEl[di], '0' |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| lessThanTen: ; |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| mov ah,09h ;output command |
|  |

|  |
| --- |
| lea dx, InputMsgStr ;show input msg to user |
|  |

|  |
| --- |
| int 21h |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| pop di |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| ret ; |
|  |

|  |
| --- |
| endp |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| ShowErrorInputHigherBoundMsgStr proc |
|  |

|  |
| --- |
| push ax |
|  |

|  |
| --- |
| push dx |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| mov ah,09h |
|  |

|  |
| --- |
| lea dx, ErrorInputHigherBoundMsgStr |
|  |

|  |
| --- |
| int 21h |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| pop ax |
|  |

|  |
| --- |
| pop dx |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| ret |
|  |

|  |
| --- |
| endp |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| ShowErrorInputArrayLengthMsgStr proc |
|  |

|  |
| --- |
| push ax |
|  |

|  |
| --- |
| push dx |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| mov ah,09h |
|  |

|  |
| --- |
| lea dx, ErrorInputArrayLengthMsgStr |
|  |

|  |
| --- |
| int 21h |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| pop ax |
|  |

|  |
| --- |
| pop dx |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| ret |
|  |

|  |
| --- |
| endp |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| CheckMatch proc ;Ïðîöåäóðà ñðàâíåíèÿ |
|  |

|  |
| --- |
| mov ah, LowerBound ;Çàãðóæàåì â ah ëåâóþ ãðàíèöó äèàïàçîíà |
|  |

|  |
| --- |
| cmp Array[di],ah ;Ñðàâíèâàåì |
|  |

|  |
| --- |
| jl notMatch ;Åñëè ìîæíî ñäåëàòü âûâîä, ÷òî ýëåìåíò äèàïàçîíó íå ïðèíàäëåæèò - âûõîäèì èç ïðîöåäóðû |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| mov ah, HigherBound ;Àíàëîãè÷íî äëÿ ïðàâîé ãðàíèöû ìàññèâà |
|  |

|  |
| --- |
| cmp Array[di],ah ; |
|  |

|  |
| --- |
| jg notMatch ; |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| inc bx ;bx ñîäåðæèò ñêîëüêî ýëåìåíòîâ ; |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| notMatch: ; |
|  |

|  |
| --- |
| ret ; |
|  |

|  |
| --- |
| endp ; |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| Do proc ; |
|  |

|  |
| --- |
| xor bx, bx ;Îáíóëÿåì bx, ò.ê â bx áóäåò õðàíèòüñÿ îòâåò |
|  |

|  |
| --- |
| mov cl,ArrayLength ;Çàãðóæàåì â cx äëèíó ìàññèâà, ÷òîáû ÷åðåç loop ïðîéòèñü ïî êàæäîìó ýëåìåíòó |
|  |

|  |
| --- |
| xor di, di ;Îáíóëÿåì di, ò.ê. ïðîõîä áóäåì íà÷èíàòü â íóëåâîãî ýëåìåíòà |
|  |

|  |
| --- |
| DoLoop: ; |
|  |

|  |
| --- |
| call CheckMatch ;Âûçîâ ôóíêöèè ïðîâåðêè |
|  |

|  |
| --- |
| inc di ;Óâåëè÷èâàåì di ÷òîáû ïåðåéòè ê íîâîìó ýëåìåíòó |
|  |

|  |
| --- |
| loop DoLoop ; |
|  |

|  |
| --- |
| ret ; |
|  |

|  |
| --- |
| endp ; |
|  |

|  |
| --- |
| ; |
|  |

|  |
| --- |
| output proc ; |
|  |

|  |
| --- |
| lea dx, ResultMsgStr ; |
|  |

|  |
| --- |
| mov ah, 09h |
|  |

|  |
| --- |
| int 21h |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| mov ax, bx |
|  |

|  |
| --- |
| mov al, bl |
|  |

|  |
| --- |
| mov bl, 10 |
|  |

|  |
| --- |
| div bl |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| xor di, di |
|  |

|  |
| --- |
| inc di |
|  |

|  |
| --- |
| mov Answer[di], ah |
|  |

|  |
| --- |
| add Answer[di], '0' |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| test al, al |
|  |

|  |
| --- |
| jz lessThanTen1 |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| dec di |
|  |

|  |
| --- |
| mov Answer[di], al |
|  |

|  |
| --- |
| add Answer[di], '0' |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| lessThanTen1: ; |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| lea dx, Answer |
|  |

|  |
| --- |
| mov ah, 09h |
|  |

|  |
| --- |
| int 21h |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| lea dx, enterStr |
|  |

|  |
| --- |
| mov ah, 09h |
|  |

|  |
| --- |
| int 21h |
|  |

|  |
| --- |
|  |
|  |

|  |
| --- |
| xor ax, ax ; |
|  |

|  |
| --- |
| mov ah,4ch ;Âûõîäèì èç ïðîãðàììû |
|  |

|  |
| --- |
| int 21h ; |
|  |

|  |
| --- |
| ret ; |
|  |

|  |
| --- |
| endp ; |
|  |

|  |
| --- |
| ; |
|  |

end start ;