- CPSC 275: Introduction to Computer Systems

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Fall 2025

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Homework 20

NOTE: You are not required to hand in the following exercises, but you are strongly encouraged to complete them to strengthen your understanding of the concepts covered in class.

1. Consider the following declarations:

```
short S[7];
short *T[3];
long double V[8];
long double *W[4];
```

Fill in the following table describing the element size, the total size, and the address of element `i` for each of these arrays.

Array	Element size	Total size	Start address	Element `i`
S			x_S	
T			x_T	
V			x_V	
W			x_W	

2. Suppose the address of `short int` array `S` and integer index `i` are stored in registers `%edx` and `%ecx`, respectively. For each of the following expressions, give its type, and an assembly code implementation. The result should be stored in register `%eax` if it is a pointer and register element `%ax` if it is a `short int`.

Expression	Type	Assembly code
S+1		
S[3]		
&S[i]		
S[4*i+1]		
S+i-5		

3. Write an IA-32 function `sum` that computes and returns the sum of the first `n` elements of an array of integers, `arr`.

4. Write an IA-32 function `max` that computes and returns the maximum value of the first `n` elements of an array of integers, `arr`.

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