CS 2113 Exercise 2: Memory in C

Name: **NetID (email username):**

Question 1

Consider this code and memory layout at right:

```
int i;

int main()
{
    int j;
    char c;
    int *pi;
    char *pc;
    int k;

    i = 42;
    c = 't';
    pi = &i;
    j = *pi;
    i = 10;
    pc = &c;
    *pc = 'X';
```

Globals		
Address	*Name*	*Contents*
500	i	

Stack		
Address	*Name*	*Contents*
10000	j	
10008	c	
10009	pi	
10017	pc	
10025	k	

```
    printf("j = %d", j);          _____

    printf("pi = %d", pi);        _____

    printf("*pi = %d", *pi);      _____

    printf("&j = %d", &j);        _____

    printf("&pi = %d", &pi);      _____

    printf("c = %c", c);          _____

    return 0;

}
```

a) The starting memory address for each variable has been filled in for you in the diagram. Step through the code and show the final memory contents just before the return call is executed.

b) Fill in the blanks to show what would be displayed by each of the print statements.

Question 2
a) How much memory is used to store an int, char, int*, and char* on the system illustrated in Question 2?

BONUS: Can you think of a reason why a char* uses more memory than just a char?

Question 4
What are two differences between arrays in C and Java that you need to be careful about?