

CPSC 360 C Programming Test

Question 1 (50 points): Write a function `repeat()` to repeatedly print out a character in computer screen. The function prototype is,

```
void repeat(char c, int how_many);
```

Function call,

```
repeat('A', 8);
```

should print out 8 times of character 'A' in computer screen.

Use the function `repeat()` to write a program that output a triangle as follows in computer screen:

```
x
xxx
xxxxx
xxxxxxx
xxxxxxxxx
```

Answer:

```
#include <ctype.h>
#include <stdio.h>

void repeat(char, int);

int main(void)
{
    char    c = 'x';
    int     i;
    for (i = 1; i < 10; i += 2) {
        repeat(c, i);
        putchar('\n');
    }
    return 0;
}

void repeat(char c, int how_many)
{
    int i;
    for (i = 0; i < how_many; ++i)
        putchar(c);
}
```

Question 2 (50 points): Write a bubble sort function and its related swap function to sort an array of integers. The prototypes of those functions are,

```
void swap(int *, int *);
void bubble(int a[], int n)    /* n is the size of a[] */
```

Use those functions to write a program to sort the following array:

```
int x[] = {7, 3, 66, 3, -5, 22, -77, 2};
```

Print out the results as,

```
    -77    -5    2    3    3    7    22    66
```

Answer:

```
#include <stdio.h>
void swap(int *, int *);
void bubble(int a[], int n);
int main(void)
{
    int a[] = {7, 3, 66, 3, -5, 22, -77, 2}, i;
    bubble(a, 8);
    for(i = 0; i < 8; i++) printf("%d ", a[i]);
    printf("\n");
    return 0;
}

void swap(int *p, int *q)
{
    int tmp;
    tmp = *p;
    *p = *q;
    *q = tmp;
}

void bubble(int a[], int n)
{
    int i, j;
    for(i = 0; i < n; i++)
        for(j = n - 1; j > i; j--)
            if(a[j-1] > a[j])
                swap(&a[j-1], &a[j]);
}
```