CS1 - Exercise 3

1. Write down what each of the following pieces of code prints out. If there is an error in the code, describe the error.

(a)

```
for a in range(0, 5):
        for b in range(0, 5):
                if is_perfect_square(a, b):
                        print(str(a*b) + “  is a perfect square)
                else:
                        print(str(a*b) + “  is not a perfect square)
```

(b)

```
a = False
while not a:
        for x in range(3, 22):
                if a == 13:
                        a = True
```

(c)

```
def return_false():
        print(False)
        return False

def return_true():
        print(True)
        return True

a = return_false() or return_true()
b = return_true() or return_false()
c = return_false() and return_true()
d = return _true() and return_false()
print(a, b, c, d)
```

(d)

```
n = -1
while n > -3:
        print(n, m)
        m = n - 1
        while m > -4:
                m -= 1
        n-= 1
        print(m, n)
```

2. Write the selection_sort algorithm with a while loop instead of a for loop (hint: refer to chapter 9).

6. Modify the selection_sort algorithm to order the characters in a string (e.g., “bafdc” -> “abcdf”).

7. Modify the bouncing ball gravity problem found in chapter 10 so that the source of gravity flips from the bottom to the top of the screen every x seconds (do this problem on your computer, not by hand).