

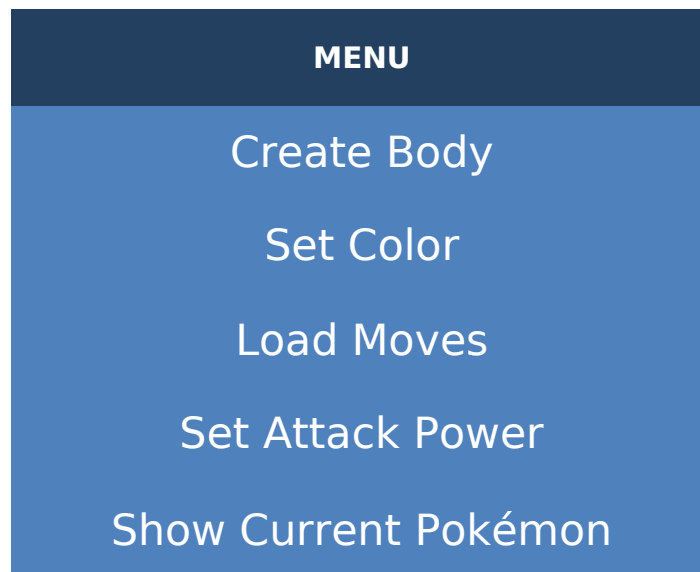
CSE102 – Computer Programming

Homework #1

Due Date: 01/03/2019

Hand in: A student with number 20180000001 should hand in a file named 20180000001.c for this homework and compress it into a .zip file.

Professor Oak who is known as Pokémon creator, lost his laboratory on a explosion because of an mischievous fire Pokémon. After so much effort, Prof. Oak rebuild his own lab but he couldn't activate Pokémon creating machine because storage of the machine has broken. Professor can do wonders with Pokémon's but he doesn't know anything about software developing. Therefore, he asked students of Gebze Technical University for help to make the machine functional again. Professor send an image of the old machine's control panel that is shown below:



You are expected to code a function for each menu option. Write the code of the functions that are shown below by obeying given function prototypes.

Part 1. [20pts] Write a function that takes shape of the Pokémon as an input and calculates area of the shape and returns it. Parameters that are used to calculate the area of the shape must be taken from the user in the function. Number of the parameters can be changed according to the shape of the Pokémon. The shapes could be rectangular, square or circular and all the shape types must be pre-defined on the program like: Square is 1, rectangular is 2 and circular is 3. The function prototype is:

`double CreateBody (int shape)`

Part 2. [20pts] Write a function that takes a color code as an integer input to paint the Pokémon and returns revised color code. If the color code is between 0

and 1000 then the function returns modulo five of the code, otherwise, it always returns 1 as the revised color code. The colors could be red, yellow, blue, black or white and all the colors must be pre-defined on the program like: red is 0, yellow is 1, blue is 2, black is 3 and white is 4. The function prototype is:

```
int SetColor (int color)
```

Part 3. [20pts] Write a function that takes shape and size of the body as an input and calculates length of one move of the Pokémon and returns the length. The length of one move is equal to perimeter of the body (Assume that the shorter edge is 5 if the shape is rectangular). The function prototype is:

```
double LoadMoves(int shape, double body_size)
```

Part 4. [20pts] Write a function that specifies attack power of the Pokémon. It takes lower and upper bound of the attack power and generates a random integer attack power between the bounds and returns the power. The function prototype is:

```
int SetAttackPower(int lower_bound, int upper_bound)
```

Part 5. [20pts] Write a function that prints created Pokémon with its wonderful specifications like the figure that is shown below:

(Rectangular Pokémon example)

XXXXXXX

XXXXXXX

XXXXXXX

XXXXXXX

XXXXXXX

Name: Rectangular Pokémon

Size: 35

Color: Red

Move: 24

Attack Power: 78

(Circular Pokémon example)

X

X X

X

Name: Circular Pokémon

Size: 28.26

Color: Blue

Move: 18.84

Attack Power: 102

As you notice, the shapes of the Pokémon's are dynamic and that means you should print them according to their size. On the figure that is shown above, the function prints X's by the length of the edges on vertical and horizontal direction (Assume that the shorter edge is 5 if the shape is rectangular). If the shape is

circular then put tabs between two X's which are on the middle of the shape as much as minus one of the radius of the shape, and align the other rows as expected by using the middle row. The function prototype is:

```
void ShowPokemon(int shape, double body_size, int color, double
                 move_length, int attack_power)
```

The main function must be like as shown above:

```
...
int main ()
{
    int shape, color, attack_power;
    double size_of_body, move_length;
    shape = RECTENGULAR / CIRCULAR / SQUARE // Pick one of them
    size_of_body = CreateBody (shape)
    color = 798
    color = SetColor(color)
    move_length = LoadMoves(shape, size_of_body)
    attack_power = SetAttackPower (0, 150)
    ShowPokemon(shape, size_of_body, color, move_length, attack_power)
}
```

General Rules:

1. Obey and don't broke the function prototypes that are shown on each part, otherwise, you will get zero from the related part.
2. The program must be developed on Linux based OS and must be compiled with gcc compiler, any problem which rises due to using another OS or compiler won't be tolerated.
3. Note that if any part of your program is not working as expected, then you can get zero from the related part, even it's working in some way.
4. Upload your .zip file on to Moodle to deliver your homework. The zip file must consist of one .c file that contains the code of your solutions. Name format can be found on the top of this homework sheet.
5. You can ask any question about the homework by sending an email to b.koca@gtu.edu.tr .