Build your own bot

Exercises

Do nothing

- Sometimes you want to save up energy

- **Write a "Do Nothing" Command**

- Hints:
  - Create a method so you can use it again
  - Your main bot code is in Bot.java

```java
public String doNothing() {
    return "";

}
```

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Place a building

- Place an energy building at coordinate 0,0

- Hint
  - You can get the building numbers from the BuildingType enum

```
return "0,0,2";
```

```
return "0,0," +
BuildingType.ENERGY.getType();
```

Get the round

- Get the current round
  - Hint: Look at game Details

- if round == 10 place energy building at coordinate 0,0

```
if (gameDetails.round == 10) {
    // Building logic here
}
```

Get energy

- Get your available energy
  - Hint: Look at Myself

- if energy > 40 place attack building at coordinate 0,1

```
if (myself.energy > 40) {
    return "0,1,1";
}
```

Combine Steps

- if Round > 50 AND energy > 30
  place defense building at coordinate 0,2
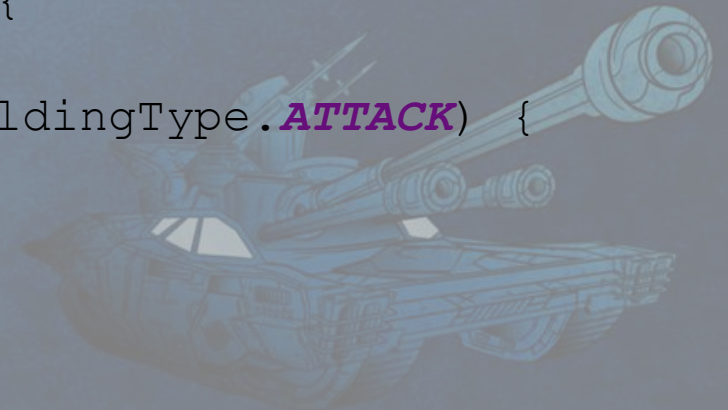
- Hint:
  - The symbol for and is &&

```
if (myself.energy > 30 && gameDetails.round > 50) {
    return "0,2,2";
}
```

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Spy on Your opponent

- Does your opponent have an Attack Building?

- Hint:
  - Look at the buildings list

```java
public String run() {
    enemyHasAttackBuilding(buildings);
    return "";

}


public boolean enemyHasAttackBuilding(List<Building> buildingsToCheck) {
    for (Building building : buildingsToCheck) {
        if (building.isPlayers(PlayerType.B)
                && building.buildingType == BuildingType.ATTACK) {
            return true;
        }
    }
    return false;
}
```

Spying (Part 2)

- in what lane is your opponents attack building?

- Hint:
  - You will now have to look at the game map

```java
public String run() {

    for (CellStateContainer cell : gameState.getGameMap()) {
        if (enemyHasAttackBuilding(cell.getBuildings())) {
            //You have found a building!
            return "1," + cell.y + ",0";
        }
    }
    return "";
}
```

What about defense?

- Does your opponent have an Defense Building?
- In What lane is it?

- Solution:
  - Apply same logic as For attack buildings

Protect Your Base

- You have found an attack building, now defend yourself

- Try **TO PLACE A DEFENCE BUILDING IN THE SAME LANE AS YOUR OPPONENT'S ATTACK** building

- First column:
```
return "0," + lane + ",0";
```

- Middle of the board:
```
int column = gameDetails.mapWidth/2 - 1;
return column + "," + lane + ",1";
```

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Choices

- **What if I have enough energy but don't make a choice?**

- If Energy > 50
    - Choose a random Lane
    - Build an attack building in it

- Hint: How to generate a random number

```java
Integer randomLane = new Random().nextInt(gameHeight);
```

```java
if (myself.energy > 50) {
    Integer randomLane = new Random().nextInt(gameHeight);
    return "0," + randomLane + ",1";
}
```

Invalid Moves?

- Check if A cell is empty before trying to build
  - Hint: Add a helper function in GameStaTe.java to get a specific cell

- Inside GameState.java

```java
public CellStateContainer cellAt(int x, int y) {
    return gameMap[x][y];

}
```

- **INSIDE BOT'S RUN()**

```java
if (gameState.cellAt(0, lane).getBuildings().isEmpty()) {
    return "0," + lane + ",1";
}
```

Improve

- You have built a bot!

- Now improve it with your own strategy.

All details at https://challenge.entelect.co.za