

## OceanSimulator™

The following is a real-life representation of the wonders/dangers one might encounter when treading water.



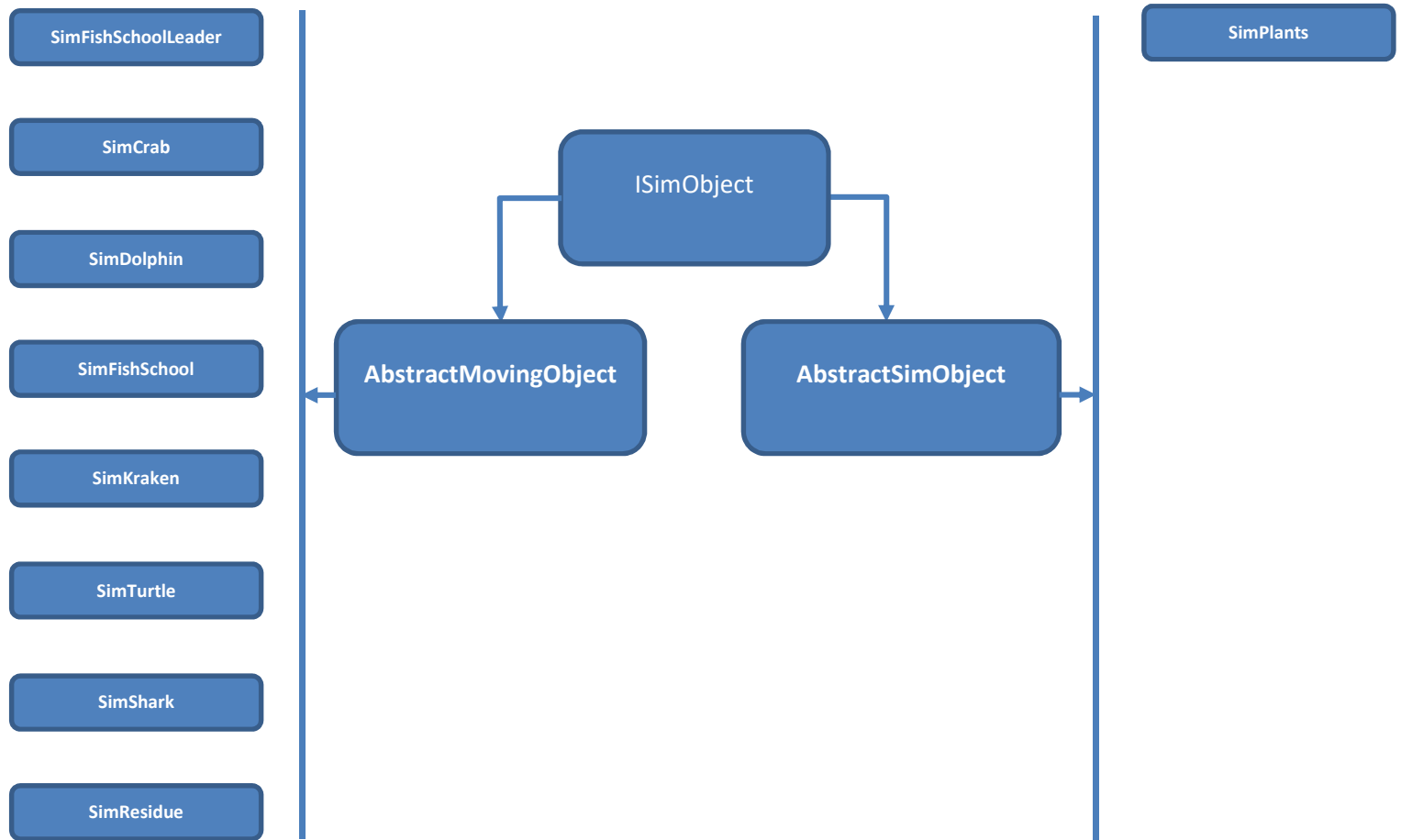
The OceanSimulator™ will display a wide variety of the ocean life. From ferocious sharks with and insatiable appetite for turtles, to the tiny crab walking along the seabed. Witness the marvelous wonders of this seemingly peaceful underwater paradise.

### Answer to first batch of questions

- 1: They are different in the way that a null check is used for the implementation in Sem2, compared to Lab5.
- 2: AbstractMovingObject have a speed, thus movement in a direction. AbstractSimObject is just a static object on the canvas which will not move on its own.
- 3: The position of an object is obtained by the use of getPosition() defined in ISimObject which is the superclass of AbstractMovingObject and AbstractSimObject
- 4: distanceTo returns the distance to center of a specified object from the center of this object. directionTo returns the direction to the center of another object.
- 5: This would be ok if all objects would have the same speed.
- 6: To change the direction, one can modify the step() method in the respective class.

**7:** One can access and modify the position through get methods in SimMain, so I don't think it should be necessary to have public methods.

### Class overview



**SimFishSchoolLeader:** Swimming around in the vast abyss, closely followed by his herd of likeminded fish.

**SimCrab:** Wanders aimlessly on the seabed searching for food to consume. This doesn't mean that a crab can't have dreams and aspirations. Looking up towards the life above, a strong desire to swim slowly arises...

**SimDolphin:** Can be summoned to chase away the shark. The dolphins have a short span of interest, and will thus disappear after a brief period. None the less, it will do an excellent job in protecting the other aquatic forms of life.

**SimFishSchool:** Following a leader, the school of fish will group around this single fish if the number of fish in a given area is less than a specified number. Thus, to some extent they will always stay together, protecting them from predators. Randomized movements of the fish are implemented within the area.

**SimKraken:** When SimCrab have been allowed to thrive with a huge supply of food, it will be converted to the Kraken. The idea was to summon the kraken, who would then consume all objects in the eco system. After the canvas is empty, the kraken would be destroyed and order would be restored.

**SimTurtle:** Floats around aimlessly in the sea, unsuspecting of the dangers lurking. An important part of the turtle's lifecycle is providing sustenance for other animals in the eco system.

**SimShark:** The predator of the sea. Will roam the canvas looking for luscious turtles to consume., continuously struggling to survive. The shark will diminish in size over time if it cannot find enough prey. In addition, it has a strong disliking of dolphins.

**SimResidue:** When food is eaten, some residue will fall to the ground. If picked up by bottom-feeders like SimCrab, it will be eaten. If not it will disappear when hitting the ground.

Classes like SimResidue and SimTurtle will also implement IEdibleObject interface, thus making them available as food for predators.

### **Second batch of questions:**

1: The system is built up prioritizing convenience and ease of reuse. By doing it this way, one can easily create new objects, literally with the touch of a button, instead of changing the code and relaunching the program. This enables flexibility and is well suited for situations where it is desirable to have a high level of modification available.

2: One could, but it would be hard to manipulate the program real time.

### **Limitations of the OceanSimulator™**

#### **Testing:**

I have not been able to focus on writing additional tests for the program.

In addition the avoidance test will fail in its current state due to SimRepellant being replaced with a Dolphin chasing it. Modification of the test would have to be implemented for it to pass.

The get best food, will also fail. Even though it works in the program the test will fail due to, I think based on the previous semester task, a forgotten -1 somewhere. To better see the functionality of the get best food, a clean and working version can be found in **a526211c**.

Also, now the simEating test will fail. I am at this current time(11.09pm) confused as to why. Nevermind, now its working again.

## Sources

Background3:

<http://beccafacemcstaplegun.deviantart.com/art/Underwater-Ruins-1-431426093>

Plant1:

[http://apologeticspress.org/user\\_images/Discovery/image/magazine/2016/06/Seaweed-Isolated-dreamstime\\_xxl\\_9900635.png](http://apologeticspress.org/user_images/Discovery/image/magazine/2016/06/Seaweed-Isolated-dreamstime_xxl_9900635.png)

Plant2:

<http://www.xray-mag.com/sites/default/files/gorgonian-soft-coral.png>

Plant3:

<http://montereyfishstore.com/wp-content/uploads/2016/06/coral-white.png>

Plant4:

Not me! But can't find the source again...

Plant5:

[http://s1296.photobucket.com/user/neken2/media/puertas/animales/coral-6\\_zpscc9e4e76.png.html](http://s1296.photobucket.com/user/neken2/media/puertas/animales/coral-6_zpscc9e4e76.png.html)

plant6:

[http://img08.deviantart.net/135c/i/2015/107/1/1/coral\\_png\\_3\\_by\\_irisustockimages-d7jxmcv.png](http://img08.deviantart.net/135c/i/2015/107/1/1/coral_png_3_by_irisustockimages-d7jxmcv.png)

plant7:

[http://img03.deviantart.net/8297/i/2013/047/3/6/coral\\_png\\_2\\_by\\_irisustockimages-d5v3rjf.png](http://img03.deviantart.net/8297/i/2013/047/3/6/coral_png_2_by_irisustockimages-d5v3rjf.png)

plant8:

<http://www.decorbold.net/v1/570x363/filetextures-under-the-seatextures-under%20the%20seacoral-redpng-30683067.png>

Kraken:

[http://img05.deviantart.net/816e/i/2016/073/9/2/poseidon\\_\\_\\_kraken\\_\\_\\_render\\_by\\_aanubis96-d9v36uq.png](http://img05.deviantart.net/816e/i/2016/073/9/2/poseidon___kraken___render_by_aanubis96-d9v36uq.png)

Food: <https://clipartfest.com/categories/view/b8902298157b75370b98c8ad6955c45fcd4e555c/shiny-ball-clipart.html>

Crab:

[http://s643.photobucket.com/user/belen\\_kx2/media/crab7.png.html](http://s643.photobucket.com/user/belen_kx2/media/crab7.png.html)

Dolphin:

<http://www.clipartbest.com/cliparts/9i4/667/9i4667M6T.gif>

Nemo:

Not me! Can't find source.

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SharkAnimate:

<http://bestanimations.com/Animals/Fish/Sharks/animatedshark-8.gif>

Turtle:

<http://bestanimations.com/Animals/Reptiles/turtles/swimming-turtle-animated-gif-4.gif>

Sound:

CrabEat:

[https://www.freesound.org/people/PaulMorek/sounds/172138/download/172138\\_paulmorek\\_nom-d-03.wav](https://www.freesound.org/people/PaulMorek/sounds/172138/download/172138_paulmorek_nom-d-03.wav)

DolphinClick:

<http://s17.onlinevideoconverter.com/download?file=f5d3i8j9d3j9d3b1>

BackGroundMusic:

<https://www.youtube.com/watch?v=Sds8vgkZykc>

SharkBite:

<http://s28.onlinevideoconverter.com/download?file=b1d3a0d3b1c2>