Team THS116

Problem Definition:

After the recent disasters in Houston, Texas, most of Florida and Puerto Rico, billions of dollars of damage occurred to buildings, neighborhoods and countless lives from these natural disasters. What we are trying to decide is if a little bit of planning could have prevented the amount of damage inflicted. Specifically in Houston, could city planners rebuild the city from the ground up to prevent such a devastation from happening again? Or with the threat of the San Andreas Fault in California, could they prevent the complete collapse of homes in that region? Or in tornado alley, how could they rebuild homes that have been whipped out by tornadoes without having to worry about the same the same tragedy from happening again? The focus of our project is to use the parameters established in damage scales for varying natural disasters to build a disaster simulator that has the potential to be used for habitable environment development so that new buildings can be built upon the database of knowledge that society has learned from past disasters.

Problem Solution:

We will use Eclipse Oxygen to code a database off of real-life disaster damage scales, which will result in a fairly accurate simulation package that will allow for simulation testing of building models. We will be using Java, because it is the coding language that we are most familiar with. Java is good for this project because we have to declare each variable for what they are, which makes documentation easier and makes the code easier to read, more maintainable, and flexible. This project has a plethora of variables, so having the flexibility to name each variable separately helps when writing the code. Also, when conducting research about which homes hold up better against each disaster, we will use primarily credible sources. Such as FEMA, OAS, NOAA, and UCOP.

Progress to Date:

So far, we have designated variables for the aspects of a home, and conducted research to determine which ones hold up better against natural disasters. The disasters we chose are tornadoes, hurricanes, and earthquakes. There are about sixty-five variables and three natural disasters for us to work with. So far in the code, we have the entire user interface completed, and we are currently working on developing an algorithm to asses the damage inflicted by each disaster onto each combination of variables.

Expected Results:

By the deadline, we expect to have a running code that can somewhat simulate the effects of damage and the resistance on each building type. Whoever uses the code can select one of the buildings we pre-designed, to get an idea of how the simulator works, which variables (aspects) are better against each disaster, and ?. Then, they can design their own building by selecting their desired combination if variables. From there, the program will generate a damage scale based on a number system assigned to each variable and to each disaster.

Citations of Information:

1. https://www.fema.gov/media-library-data/20130726-1535-20490-9409/fema232part2.pdf
2. https://earthquake.usgs.gov/hazards/urban/sfbay/soiltype/
3. http://www.nytimes.com/1994/01/20/us/earthquake-why-buildings-collapsed-quake-revealed-flaws-safe-structures-design.html
4. https://www.fema.gov/media-library-data/1506200887663-4b8b91d86e54b14810365c988de38037/Mitigation_BuildingBackStronger.pdf
5. http://www.oas.org/pgdm/document/bitc/papers/gibbs/gibbs_01.htm