6.05 modelling applications

LogoType™

Profit/Loss
=(E3*F3)-(C3*D3)
=(E4*F4)-(C4*D4)
=(E5*F5)-(C5*D5)
=(E6*F6)-(C6*D6)
=(E7*F7)-(C7*D7)
=SUM(G3:G7)

uter modelling and stimulation

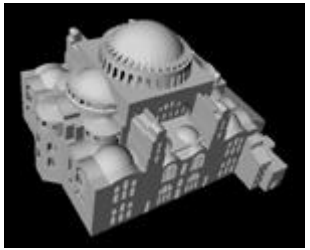
Computer modelling uses mathematical formulae to describe something. The formulae are used to analyze or pr edict how something will behave in different conditions.

There are two obvious reasons for modelling a situation: to test situations without endangering anybody; to test t heir feasibility without spending large sums off money.

Simulations aim to mimic (copy) real life systems in order to see the outcomes of different scenarios
Another name for a computer simulation that mimics real-life situations is a '**computer model**'.
Computer simulations can be created for a range of applications including:

Finance Simulation Flight Simulation Driving Simulation 3D Models

Profit/Loss
=(E3*F3)-(C3*D3)
=(E4*F4)-(C4*D4)
=(E5*F5)-(C5*D5)
=(E6*F6)-(C6*D6)
=(E7*F7)-(C7*D7)
=SUM(G3:G7)



Advantages of using computer models/simulations

- **Cheaper -**Modelling a situation is often much cheaper than carrying out the task for real. For example, architects can **make and solve design errors on simulated buildings** rather than waiting until the real thing is constructed before realising.

- **Safer -**Flight simulators mimic the skills needed to fly a plane. Novice pilots are **likely to crash the plane** whilst they are **learning**. This could be **fatal if piloting a real aircraft**. If a simulated plane is crashed, they just **reload the simulation** and try again.

- **Saves Time -**Simulations can produce results **faster than the real thing**. For example, **global warming** models can predict the **temperature of the earth in 50 years time** without actually having to wait that long.

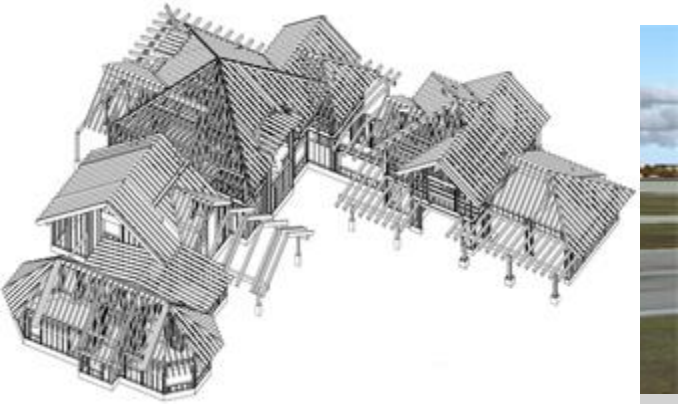
- **Greater Range of Situations -**Simulations can be programmed to mimic a wide range of **extreme situations**. For example, **pilots** can be exposed to **storms**, **volcanic ash clouds**, **high winds** etc. In real life these conditions cannot be guaranteed.

Disadvantages of using computer models/simulations

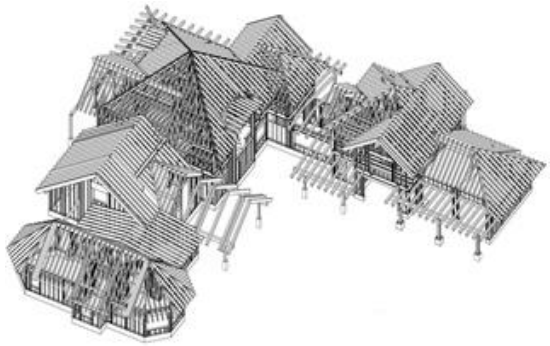
- Accuracy - Modelling a situation can never perfectly mimic real life. There will always be some difference between the model and reality.

- Initial Expense - Simulators require sophisticated hardware and software. For example, high powered processors and lots of RAM. The simulation software (program) can also be expensive.

- Programmer Error - If the simulation's programmer has made errors whilst creating the program, the simulation outcomes will be more inaccurate.



Crashing a plane in a flight-sim is safe.



Buildings can be perfected in a 3D model before money is spent on actual construction

PC flight sim for use in the home

Some simulators require expensive hardware

Some driving simulators are for entertainment
purposes like Test Drive Unlimited 2