Assignment Two is an extension of Assignment One. This assignment is to be done individually with a single entry handed in on both hard and soft copy. The complete assignment is worth 20% of the final mark for this unit. Due date of submission is Friday 28th May, 2004.

In Software Engineering, in addition to Requirement Analysis and Design, are other important processes such as Verification and Validation, Risk Management, Quality Management and Cost Estimation.

With respect to the project you have selected in Assignment One, you are required to submit your recommendation on how to carry out ANY ONE of the following processes:

1. Verification and Validation
2. Risk Management
3. Quality Management
4. Cost Estimation

If you have worked as a team in Assignment One, you and your team members must select DIFFERENT processes. In other words, you have to liaise with your members to ensure no duplication of the processes. You also need to supply the name of the team members and the process they have selected in your report.

You are expected to provide a background discussion on the process, the methods or models commonly adopted and how the model is applied to your project. You should also explore the existence and/or availability of standards and tools for the particular process. Research and sourcing of additional information are expected in this assignment. Proper referencing should be used.

Some suggestions on the issues to be considered are given on next page.
Risk Management

1) Give a list of risks. These should be placed in order, with your biggest risk first—and don’t forget to describe how you ranked them. For each risk, describe:
   • what the risk is
   • a mitigation strategy for the risk
   • a contingency plan for the risk
   • how you will know when to invoke the contingency plan.

2) A description of the process you will use for managing risk. This can be relatively brief (less than one page of text), but should be detailed enough so that each member of the team understands his/her role in managing risk.

   For example, how will your team monitor risk? What process will you use for deciding when to invoke a contingency plan? How will you handle emergencies? Will individual members of the team be authorized to carry out parts of your risk management strategy, or will the whole team need to meet and agree each action? How often will you update your list of top ten risks?

3) To help you manage risks, you need to take regular measurements of the status of your project. Choose a suitable set of project metrics that you will collect during your project, to help you monitor risk. Describe five of these metrics in detail, including:
   • what you think it might tell you;
   • whether it is a measure of your product, or a measure of the development process;
   • how frequently you plan to collect the data;
   • how much effort you think it will take to collect (e.g in minutes per week);
   • whether the method for making the measurements is algorithmic or subjective;
   • whether the scale used for the metric is nominal, ordinal, interval, or ratio.

Verification and Validation

Reviews
• Walkthroughs; Inspections; Cleanroom Theory

Proofs
• Natural Deduction; Invariant Assertions; Arrays; Procedures
• Weakest Preconditions; Symbolic Evaluation; Program Development

Unit Testing
• Black-Box; Structural; Dataflow Analysis; Partition Analysis; Coverage

System Testing
• Integration; Regression; N-Version; Safety; Tool; Reliability

Performance
• Principles; Requirements; Static Analysis; Dynamic Analysis; Evaluation
• Rate Monotonic; Rate Monotonic Case Study; Measurement; Benchmarking; Final Review

Quality Management

Quality Assurance, Standards, Planning Control; Measurement and Metrics

Cost Estimation

Costing and Pricing, Metrics, COCOMO 2 Model