**Tutorial 1**

Exercise 1: Basic Concepts

**a) "Spoilage" (SP) is an attribute of a certain type of entity: can you identify it?** SP refers to the complete product life cycle.

**b) What are the units of SP?** h/h (1) therefore no units

**c) If it was somehow determined that SP was ‘atypically large’ for some particular software application/system, what might we be able to deduce from this information?**

SP numerator is very large: too much time taken to fix defects

SP denominator is very small: not much time taken to develop product

**d) In what sense is it appropriate to describe SP as a ‘dynamic’ measure?**

When the SP value changes during its lifetime

List as many problems as you can identify with the definition of spoilage.

Potential problems with the definition of spoilage include:

1. Lack of specificity: definition does not explain what counts as defective

2. Units for numerator and denominator not given

3. Doesn’t specify what development time includes (development during maintenance?)

Exercise 2: Review of Units of Measurement

a) Where possible, determine the units of the quantities calculated by the following expressions. If not possible in a given case, explain why.

Let's calculate the units for each expression:

a) R1 + R2: **pd/SLOC**

b) 1.5\* R2 - R1: **pd/SLOC**

c) R2 \* R1: (**pd/SLOC)^2**

d) 0.673 / R1: **SLOC/pd**

e) R1 / (0.673 R2): **no units because r1/r2 cancel itself out leaving 1/0.673 with no units**

f) R2 + 1.5: **illegal**

g) R2 - S: **illegal**

h) R1 \* S: **pd**

i) (R1 / T1) \* 2: **p/SLOC**

j) E / R2: **SLOC**

k) T1 \* CpE: **£/p**

l) T1 + 2 \* T2: **illegal**

2) £ = (£/pm) \* (aS + b) hence (aS + b) must be measured as **pm**

Exercise 3: Measurement of Complexity

1) Explain what type of scale is used to measure the complexity of Java modules in the scenario described above. **The complexity of Java modules is measured using an ordinal scale. The scale consists of ordered categories (A, B, C, D, E). This scale helps us rank the complexity but doesn't show how much more complex one is than another.**

2) Classify EACH of the statements below as meaningful or not meaningful.

a) Module M3 is more complex than module M6. **(Meaningful)**

b) Module M3 is three times as complex as module M2. **(Not Meaningful)**

c) Module M3 is as complex as module M7. **(Meaningful)**

d) Twice as many modules were rated moderate in complexity as were rated low. **(Meaningful)**

e) The average complexity of the eight modules is less than moderate (i.e., less than C). **(Not Meaningful)**

Exercise 4: SMART Goals of Your Project

**Goal 1**

1. Specific: By the end of November, create a detailed wireframe of the Hall of Fame website that includes the layout, main features, and user interfaces.

2. Measurable: Break down the wireframing process into smaller tasks and milestones, such as sketching the homepage, designing user profiles, and creating project submission forms. Tracking my progress by completing each of these tasks.

3. Achievable: Ensure that I have the necessary tools and resources for wireframing, such as wireframing software or paper and pen.

4. Relevant: The wireframe is a crucial step in the development of my website project. It is directly related to my goal of creating a Hall of Fame website, as it forms the foundation for its design and functionality.

5. Time-bound: By November 15th, 2023, I will have a comprehensive wireframe of the Hall of Fame website ready for review.

**Goal 2**

1. Specific: Research and evaluate different coding languages and frameworks suitable for the back end of the Hall of Fame website.

2. Measurable: Compare the pros and cons of each coding language and framework based on factors like scalability, security, and developer community support.

3. Achievable: Allocate time each week for research and evaluation. Seek advice from experienced developers or mentors if needed.

4. Relevant: The choice of coding language is crucial for the success of my project, as it will impact the website's performance and functionality.

5. Time-bound: By 30th November, 2023, I will have selected the coding language and framework for the back end of the website.

Exercise 5: Optional Calculation

Person-month is a measure of work effort. Other similar measures are person-day and person-year.

If a project will take 2 months to finish with 3 people working full time on it, how many person-months will the project require? **6 pm**

If an employee worked 20 days on a project, how much is his contribution to the project? 1\*(20/30) = **0.666pm**

**Note**: Effort percentage question isn't clear, but if it means the percentage effort put in by an employee towards a certain project, just calculate that employee’s person-months and divide that by total person- months for that project.