Software Engineering And Programming Management

ETCT - 207

Khushi
ITE-2
031

ASSIGNMENT-1

Ques 1

Ans (i) Informative → user provides or recieve information.
(ii) Consultative → user comment on a predefined service or range of facilities.
(iii) Participative → user influence decision relating to the whole system.
(iv) User participation can reduce or even eliminate the clash between the user and the system developer in system function views.

Ques 2 Why do we fell the characteristics of requirements play a significant role in selection of lifecycle model.

Ans The basic characteristic requirement to select the process model are project type and associated risk, requirements of project and the work users. One of the key features of selecting a process model is to understand the project, in terms size,

Ques 3 What are the advantages and disadvantages of developing prototype of system?

Ans

Advantage :-

(i) This model is flexible in design.
(ii) It is easy to detect errors.
(iii) We can find missing functionality easily.
(iv) It is ideal for online system.

Disadvantage :

(i) This model is costly.
(ii) There may be too much variation in requirements.
(iii) There may increase the complexity of the system.
(iv) There may be incomplete or inadequate problem analysis.

Ques4 Why it is important to adhere to a life cycle model while dueloping a lagre softwaru product

Ans (i) Bettu estimates
(ii) On time delivering
(iii) Staying within budgets limits
(iv)
(v) Keep customers informed

Ques5 List the advantages & disadvantages of involving a softwaru engineer throughout the softwaru development planning proces?

Ans Advantages:

(i) Good pay
(ii) Portable skills
(iii) Work from any where
(iv) Comfortable working enviornment

Disadvantages:

(i) Global competition of outsourcing
(ii) Sitting Job
(iii) You have to upgrade your skills continously.
(iv) Age discumination

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ASSIGNMENT-2

Ques 1 Assuming the Putnam resource allocation model with $S = 100,000$, $C = 5000$, $D_0 = 15$, compute development time t_d and manpower development k_d.

Ans We know that $t_d = \left[\frac{1}{D_0}\left[\frac{S}{C}\right]^3\right]^{1/7}$

$$t_d = \left[\frac{1}{15}\left(\frac{1000000}{500}\right)^3\right]^{1/7}$$

$$= [0.066 \times (8000000)^3]^{1/7}$$

$$= [528000]^{1/3}$$

$$= 12.05 \text{ years}$$

further $k = \left(\frac{1}{t_d}\right)^4 \left(\frac{S}{C}\right)^3$

$$= \frac{1}{(12.05)^4} \times \left[\frac{1000000}{5000}\right]^3$$

$$= \frac{(200)^3}{(12.05)^4} = 37.94$$

Now, $k = k_d \times 6$

$$k_d = \frac{k}{6} = \frac{37.94}{6}$$

$$= 6.32$$

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Ques 2 Consider a software project with the following information domain characteristics for consideration of function metric.

Number of external inputs (I) = 30

Number of external outputs (O) = 60

Number of external inquiries (E) = 23

Number of files (F) = 08

Number of external interfaces (N) = 02

It is given that the complexity weighting factors for I, O, E, F, and N are 4, 5, 4, 10 and 7, respectively. It is also given that, out of fourteen value adjustment factors are not applicable, each of the other four factors have value 3, and each of the remaining factors have value 4. Compute value of function point metric.

Ans 2 The value of function point metric = UPF x VAF

UPF = 4*30 + 60*5 + 23*4 + 8*10 + 7*2 = 606

VAF = (TDI * 0.01) + 0.65 (TDI = total degree of influence)

TDI = 3*4 + 0*4 + 4*6 = 36

VAF = (36 * 0.01) + 0.65

= 1.01

FP = UPF * VAF

= 1.01 * 606

= 612.06

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ASSIGMENT-3

Ques 1 Assume that a program will experience 200 failures in infinite time. It has now experienced 100. The initial failure intensity was 20 Failures/CPU hr. Determine the current failure intensity.

(a) Find the decrement of failure intensity per failure.

Current failure intensity = Intensity of failure initial x
(1 - Experienced failure / failure in infinite times)

$= 20 \times \left(1 - \frac{100}{200}\right)$

$= 20 \times \frac{1}{2} = 10$ failure / CPU hr.

Decrement in failure intensity:

$= \quad = \frac{-20}{200} = -0.1$ hr/CPU

(b) Calculate the failure experiment & failure intensity after

Ans $u(t) = V_0 \left(1 - \exp\left(-\frac{\lambda_0 t}{V_0}\right)\right.$

$= 200 \left(1 - \exp\left(\frac{-20 \times 20}{200}\right)\right)$

$= 200 \left(1 - \exp\right.$

$= 200 (1 - 0.1353)$

$= 173$ failure

$\lambda(t) = \lambda_0 \exp\left(\frac{-\lambda_0 t}{V_0}\right)$

$= 20 \exp\left(\frac{-20 \times 20}{200}\right)$

$= 20 \exp(-2)$

$= 2.71 \frac{\text{failures hr}}{\text{CPU}}$

(c) failure experiment of failure intensity after 100 CPU/hr.

$$\mu(t) = V_0\left(1 - \exp\left(\frac{-\lambda_0 t}{V_0}\right)\right)$$

$$= 200\left(1 - \exp\left(\frac{-20\times100}{200}\right)\right)$$

$$= 200 \text{ failures}$$

$$\lambda(t) = \lambda_0 \exp\left(\frac{-\lambda_0 t}{V_0}\right)$$

$$= 20 \exp\left(\frac{-20\times100}{200}\right)$$

$$= 0.0000908 \ \frac{\text{failures}}{\text{CPU}} \text{ hr.}$$

(d) Additional failure require to reach failure intensity of

$$\Delta\mu = \frac{V_0}{\lambda_0}(\lambda_P - \lambda_F) = \frac{200}{20}(10-5) = 50 \text{ failures}$$

The additional time:-

$$\Delta t = \frac{V_0}{\lambda_0} \ln\left(\frac{\lambda_P}{\lambda_F}\right) = \frac{200}{20} \ln\left(\frac{10}{5}\right) = 6.93 \text{ CUPin}$$

Ques 2 What are uses of reliability studies.

Ans (i) To find number of failures occuring in the specific period of time.

(ii) To discover main cause of failure.

(iii) To peformance testing of various modules of software product after finding defects.

Ques 3 Explain how CMM encourages improvement of the software process.

Ans (i) It encourages the achievement of higher maturity level in some cases by displaying the true imission, which is improving the process of overall software quality.

(ii) It only helps if it is put into the place early in the software development process.

(iii) It has no formal theoretical basics & infact it is based on the experience of very knowledgeable people.

Ques 4 What are the various key process areas at different level in CMM?

Ans (a) Ability to perform
(b) Activities performed
(c) Measurement and Analysis
(d) Verifying implementation

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ASSIGNMENT-4

Ques 1 Consider a small program and show why it is practically impossible to a exhaustive testing.

Ans It is not possible to peform exhaustive testing. For most of the system it is near impossible due to following reason:-

(i) The domain of possible inputs of program is too large to be completely used in testing or system. There are both valid input & invalid inputs.

(ii) The input domain of a system can be very large to be completely used in testing a program.

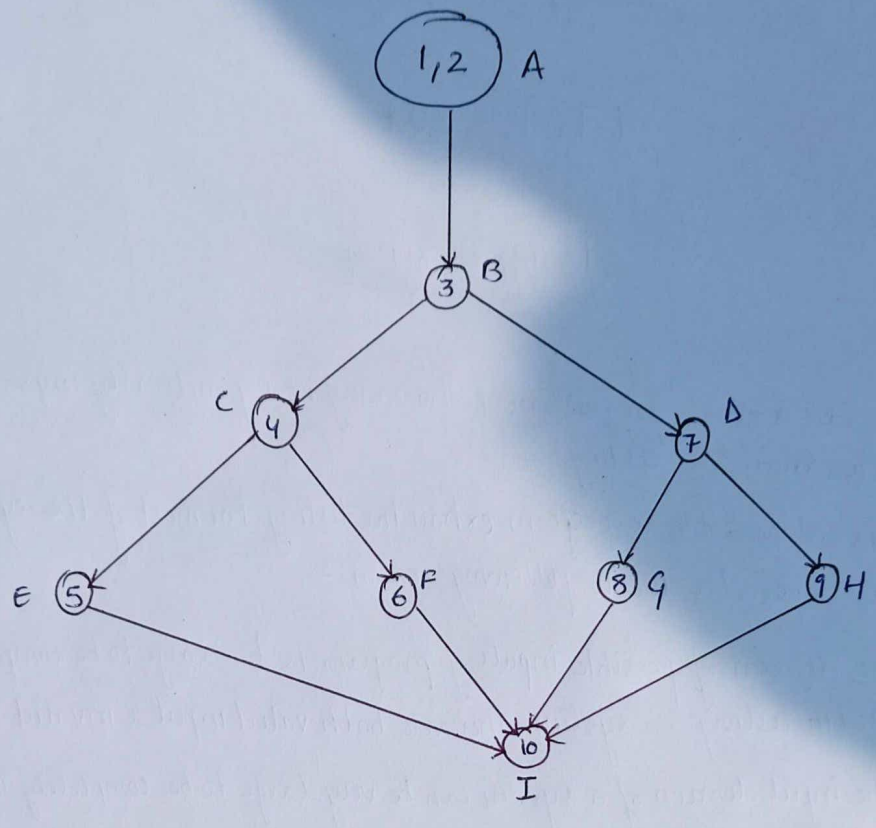
Ques 2 Explain boundary value testing with the help of example?

Ans A boundary value is an input or output value on the border of an equivalence curve/portion, includes minimum & more values at inside & outside boundaries.

Example:- Consider the field that hold maximum, 5 digit character. The minimum value of field is 99999 & minimum value is 10000. These are the boundary values & values below minimum & above minimum, all fall under invalid cases & testing is done according to that.

Ques 3 Draw the flowgraph for program of three numbers & find all independent paths that will guarantee that all statements in the program have been tested.

Ans 3



Number of independent path = V(a) = e − n + 2

= 11 − 9 + 2

= 4

Ques 4 What are the objectives of testing? Why is the psychology of or testing person important?

Ans 1. Finding defects which may get created by the programmer while developing software.

2. To prevent defects.

3. To make sure that end result meets the user requirements.

⟶ The goal of psychological assessment are to better understand person's strength & , emotional reactivity & make recommendation for treatment.