

# A Case Study On Model Based Test Case Prioritization

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**Abstract:** Examination prioritization incorporates booking tests with the goal that the execution of programming testing can be his paper, show based investigation prioritization using Memetic figuring, is proposed for giving a generally helpful game plan in prioritization and headway issue which can be used profitably. A model based testing method is exhibited. This methodology can sort out trial using activity diagram and innate estimation. The result shows that using this methodology with Memetic computation (MA) give profitability and precision to test cases.

**Keywords:** Software testing-Genetic Algorithm (Base Algorithm), Memetic Algorithm (Derived from GA) Activity Diagram, hubs and edges, target work, wellness work, experiment, SDLC. prioritization

## I. INTRODUCTION

Nowadays various new writing computer programs are being created and in like manner changes are being made to the present programming for progression. An item encounters all of the times of SDLC what's increasingly, through testing is been performed to fabricate the appropriateness by the end client. Backing of Software is a basic stage Nowadays various new writing computer programs are being created and in like manner changes are being made to the present programming for progression. An item encounters all of the times of SDLC what's increasingly, through testing is been performed to fabricate the appropriateness by the end in the Software Development Life Cycle what's more, depends after testing. Starting late the necessities for astounding programming has been extended. The end customers require programming with enleat goofs. Programming testing is one of the major and fundamental strategies for achieving destinations of great programming. Programming testing is performed to affirm that writing computer programs is fill in according to the customer detail or necessities. The inspiration driving testing is to find issues that reason programming disappointment, without a doubt finding these issues as on timetable as could be typical the circumstance being what it is. In all honesty, early investigation about inadequacies licenses envisioning the exorbitant exercises of looking into and remedial help, with a related conventionalist return.

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Precisely when the time indispensable to execute all preliminaries is long, dealing with them is central in order to find generally denounces early may spare critical time, since bug settling can begin prior. Starting now and into the foreseeable future to spare time and cash in testing stage we are dealing with examinations in programming movement utilizing, developmental estimations like GA and MA for making show based examinations. Along these lines giving a generally profitable game-plan in prioritization and improvement issue which can be utilized satisfactorily. Thusly in this paper, show based investigation prioritization utilizing memetic estimation, is proposed for reducing the time moreover, cost of testing process. Test prioritization goes for finding an execution sort out the examinations which grows a given target work. From this time forward, to oversee necessities change, a stack based system for assigning weights to the middle purposes of improvement diagram has in like way been proposed. In this paper, we have extended our past work of conveying test conditions from advancement plot by in like way mulling over the simultaneous exercises in settled movement outline.

## II. RELATEDWORK

Code based examination prioritization techniques are portrayed into three get-togethers for example clarification level social gathering, comparator gathering, likewise, work level party. For surveying the achievability of these frameworks, a primer was facilitated where seven unique endeavors were taken. Here two or three estimations like granularity were taken for preliminary prioritization. Strategy that broaden the code-thought test prioritization procedures and apply attempt prioritization at a framework level for both new and break faith tests. The upside of this philosophy is that the structure level examination prioritization systems which is known as the Prioritization of Requirements for Test (PORT) based procedures are been used. The Prioritization of Requirements for Test (PORT) method deals with framework tests dependent on four parts: utilize multifaceted nature, charge propensity, fundamentals shakiness, client need of the necessities. Structure level test prioritization systems redesigns the rate of blame disclosure for noteworthy issues. PORT method requires the social occasion to arrange framework examination and structure solid analyses. To re execute all examinations after every change in the code is a wasteful system. A method is to execute the changed lines of code with least number of examinations. The proposed examination prioritization method organizes the preliminary in a test suite in a requesting with the genuine target that less lines of code should be re executed accordingly speedier code fuse is practiced which would induce early zone of imperfections. The focal weight of code based test prioritization are it is overly exorbitant as its



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execution is moderate by ideals of the execution of the veritable code and code based preliminary prioritization may not be touchy to the other side or off base data given by analyzers and fashioners.

### III. EXISTING SYSTEM

In existing structure, code based procedures are used for programming testing. Code based testing identifies with the testing that is done on code progression, code appraisal, unit testing in programming improvement process. The code based testing includes the going with testing: Dynamic testing-Proclamation consideration, Branch incorporation and Path consideration. Static testing-Code examination, Code walkthrough, Code review, Code Audit. Code consideration based prioritization methods are confined to be used by an expansive part of the analysts. Code based systems are generally used for backslide testing. Backslide testing is a kind of testing which requires most extraordinary effort, time and cost. Backslide testing is expensive activity since it utilize an expansive segment of the supreme programming bolster costs In the cost based test prioritization strategies, the source code of the structure is used to arrange the test.

### IV. PROPOSED METHOD

The proposed method for examination prioritization does orchestrating tests utilizing hereditary calculation (GA). The proposed techniques are related on a model based framework (for example advancement chart for initiating the examination situation in prior stage) in arranging stage. In Software Development Life Cycle(SDLC), first the structure models are made. After that these models are changed over into the codes at coding stage. In the event that a fasten up is seen the middle of the course of action time of programming, it may be adjusted effectively before coding. Thusly, spoil will be dismissed to spread in programming and we could refrain from developing programming cost, time and cost on settling it. We address our stress coding in term of chromosome for GA moreover, MA figurings. Next we address our cost work for assessing the chromosomes. At long last, the structures of the estimations are introduced.

#### A. Overall Algorithm:

The Genetic algorithm process is as follows[4]:

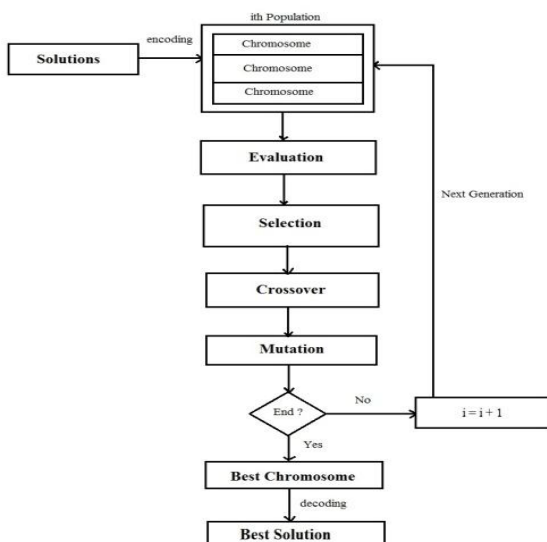


Fig 1: Genetic Algorithm Flowchart

#### B. Explanation of Base Algorithm:

[1] In Initialization step we depict the measure of chromosomes in masses and produce unusual estimation of qualities.

[2] In Assessment step we process the target work a propelling power for every chromosome passed on in instatement step.

[3] Selection of the fittest chromosomes have higher likelihood for being picked for the all inclusive community to come. Before long we have to process prosperity likelihood utilizing the wellbeing furthest reaches of each chromosome.

[4] For Crossover, we utilize one-cut point, for example aimlessly select a situation in the parent chromosome by then trading sub-chromosome. Parent chromosome which will mate is inconsistently picked and the measure of mate Chromosomes is controlled utilizing crossover\_rate ( $\rho_c$ ) parameters. Pseudo-code for the blend system is as looks for after:

```
begin k ← 0;
while(k < population)
do R[k] ← random(0-1);
if (R[k] <  $\rho_c$ )
by then
select Chromosome[k] as parent;
end;
k = k + 1;
end;
end;
```

[5] In Mutation Number of chromosomes that have changes in a masses is directed by the change rate parameter. Change process is done by replacing the gen at unpredictable position with another regard.

#### C. Architecture of Memetic Algorithm:

This fragment depicts the structure for the proposed structure, the models are given as commitment to the test framework which businesses memetic figuring to enlist yield. The yield of the test framework is differentiated and the authentic values(Fitness regard) accentuation by cycle until the moment that improvement is done. Best game plan is returned to indisputable period of building as adjusted model.

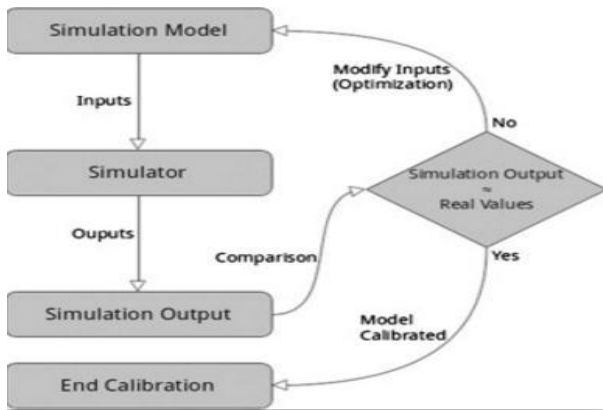


Fig 2: Architecture of Memetic Algorithm.

**D. WORKING**

This region depicts the nuances of our recommendation for trial prioritization using memetic estimation on models. The all around working of the proposed methods is given in Fig1. GA is used here as the base estimation. This computation conveys a people of individuals(chromosomes) which pushes ahead cycle by accentuation until the moment that the end condition is met. This component has sway in diminishing diffuseness of masses. We start from the best game plan of current cycle and moves to a discretionarily picked course of action by probability p. Something different better game plan in the region is picked. After end, the data game plan is superseded if the last course of action of this computation has better execution. GA is associated on a model-set up together structure i.e as for Activity Chart of every use cases, which is discussed in Fig 3. For time of trial, the Activity graph is changed over to control stream chart (CFG).weight assignment is done to find out most outrageous path incorporation in CFG. The health work is resolved and the tests are sorted out.

**V. EXPERIMENTAL RESULT**

Around there we will clear up the execution of the proposed methods for sorting out investigations subject to the activity plot in the structure appear. In the proposed procedure, GA estimations are used to find the most fundamental courses in the graph. These ways must be attempted first. The proposed procedure has a couple of parameters. So we first need to set the parameters regards. By then register one of a kind probabilities for half and half and change rates in GA figurings. After iterative subjective system of computation, the best plan is assessed. Finally, the computations are associated for different occasions and the ordinary results are represented.

**a) PROPOSED ALGORITHM:**

Step1: Introduction: Populate the Chromosomes, figure the goal work, for this masses. The goal is obliging the estimation of point of confinement  $f(x)$  where  $f(x) = ((a + 2b + 3c + 4d) - S_{max})$ . Here a, b, c, d are attributes and whole number qualities going between 0 to 14.

Step2: Now make sporadic qualities for a, b, c, d for every chromosome.

Step3: We process the target work in assessment step.

Step4: In affirmation step we use condition:  $Fitness[chromosome] = 1/(1+f\_obj[chromosome])$  Compute prosperity point of confinement and probabilities for every

chromosome. From the probabilities locate the most raised wellbeing estimation of the chromosome.

Step5: After chromosome choice, the going with strategy is picking the condition of the mutt point. This is finished by making emotional numbers between 1 to (length of Chromosome - 1).we get the cream point, guards Chromosome will be cut at blend point and its gens will be exchanged.

Step6: Perform change process. Coming about to completing change process we complete one cycle or one age of the hereditary calculation. These new Chromosomes will encounter unclear technique from the past time of Chromosomes, for instance, assessment, decision, crossbreed and change and around the end it hang loose of Chromosome for the running with complement. This strategy will be underlined until a destined number of ages and the best diagram will be grabbed as the eventual outcome of our proposed structure as "Made Test case". The development diagram in (Fig 4) is changed over into CFG and given as promise to the proposed structure as underneath.

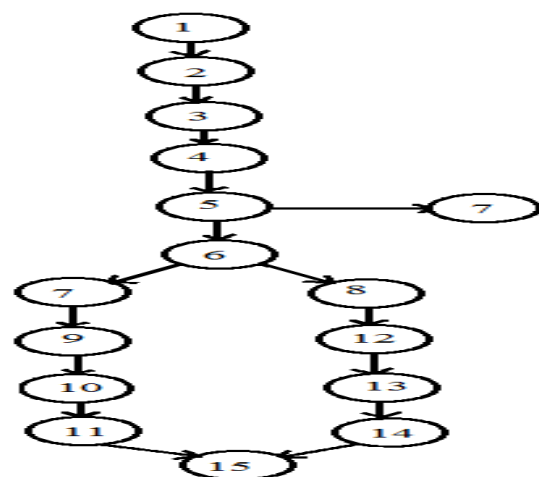


Fig 3: Control flow graph for Activity diagram.

The CFG has 15 nodes for above example corresponding to activities. The nodes are used to estimate the further values using MA step.

Table1: Weight assignment for each node corresponding to CFG

Nodes	K	Size	Weight = $S_{max-k}$
1	14	15	1
2	13	14	2
3	12	13	3
4	11	12	4
5	10	11	5
6	9	10	6
7	8	9	7
8	7	8	8
9	6	7	9
10	5	6	10
12	4	5	11
13	3	4	12
14	2	3	13
15	1	2	14
	0	1	15

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The weights are used in Memetic algorithm for prioritizing the test cases. Thus increasing the performance and accuracy.

### b) PERFORMENS ANALYSIS:

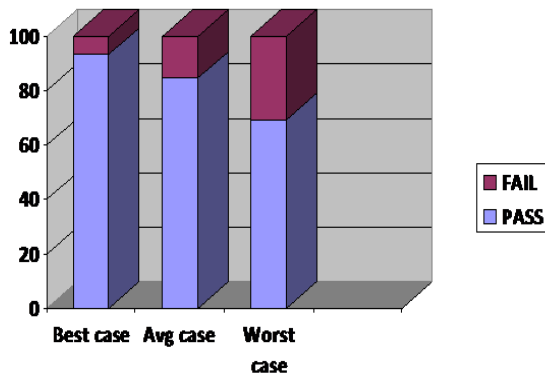


Fig 4: Performance Comparison of the Proposed

Calculation for Test Case Prioritization in a CFG Diagram  
In this portion, the delayed consequence of the proposed systems which are finished by model based strategy is shown. The execution of the tests is presented in Figure 5. In this figure, the vertical center point shows the exactness of the analyses while the level center point addresses the amount of examinations pass or fail considering a wide scope of circles and information sources using Mama. Figure 5 shows the best realize arranging most basic ways for the circumstance look at. The best result is gotten by model based methodology. (92.30(best case),84.61(average case),69.20(worst case) generally) as a rule Accuracy = 87.35(approximately)Clarification: The typical exactness is resolved as 87.35 % in light of the experiments[9]. The tests are delivered contemplating the settled circles.

## VI. CONCLUSION

This paper, demonstrates a model-based preliminary prioritization. This methodology researches the present systems, for example, code based test prioritization regarding reduce of time what's more, cost and broadened productivity of structure by dealing with examinations. The outcome displays that show based framework is better what's inexorably, appropriate to manage issues of testing in early time of Programming Development Life Cycle (SDLC). A prioritization framework is proposed for seeing the most fundamental courses in the action outline that must be endeavored first. The movement outline is changed over to the CFG and weights are doled out to its inside focuses. A prosperity work is utilized subject to focus purposes of movement plot. GA is utilized as the base framework for handling prosperity work. Subordinate upon the wellbeing respects the investigations are formed.

## REFERENCES

1. Dr. Velur Rajappa, Arun Biradar, Satanik Panda "Efficient software test case generation Using Genetic algorithm based Graph theory" International conference on emerging trends in Engineering and Technology, pp. 298--303, IEEE (2008).
2. Sahil atra , Dr.Rahul Rishi,"Improving Quality Using Testing Strategies",Journal of Global Research in Computer Science volume 2, No. 6, june 2011 R. Nicole, "Title of paper with only first word capitalized," J. Name Stand. Abbrev.
3. B. Korel and G. Koutsogiannakis, "Experimental comparison of code- based and model-based test prioritization", in Software

- Testing, Verification and Validation Workshops, 2009. ICSTW'09. International Conference on, 2009, pp. 77-84 .
4. Fatemeh Mosala Nejad "using memetic algorithm for testm case prioritization in model bsd software testing." 1<sup>st</sup> Conference on Swarm Intelligence and Evolutionary Computation (CSIEC2016), Higher Education Complex of Bam, Iran, 2016.
5. Usha Badhera1, G.N Purohit2, Debarupa Biswas3 " test case prioritization algorithm based upon modified code coverage in regression testing." International Journal of Software Engineering & Applications (IJSEA), Vol.3,No.6, November 2012.
6. 1st Conference on Swarm Intelligence and Evolutionary Computation (CSIEC2016), Higher Education Complex of Bam, Iran, 2016
7. P. Mahali and A. A. Acharya, "Model Based Test Case Prioritization Using UML Activity Diagram and Evolutionary Algorithm," ed: IJCSI, 2013.
8. Sabharwal, R. Sibal and Chayanika Sharma, "Applying genetic algorithm for prioritization of test case scenarios derived from UML diagrams," IJCSI International Journal of Computer Science Issues, vol. 8, 2011.
9. Genetic Algorithm for Solving Simple Mathematical Equality Problem Denny Hermawanto Indonesian Institute of Sciences (LIPI), INDONESIA.