Assignment Requirements for Process Data Calculator Program

Personal Software Process for Engineers

# Program 8F Requirements

Use PSP2 to write Program 8F to calculate various process data for a process that has review phases and one that does not.

For both processes, your program must input

* estimated N&C LOC
* review rate
* defect injection rate
* defect removal rate
* yield

For both processes, your program must calculate

* time in phase
* defects injected per phase
* defects removed per phase
* expected number of defects remaining after system test
* yield%

Estimate defects injected per phase, based on estimated N&C LOC and the appropriate defect injection rate. (Assume that defects are injected only in the design and code phases.)

Estimate defects removed per phase, based on the defects entering that phase and the appropriate phase yield.

* For the process with reviews, assume that defects are removed only in the design review, code review, compile, unit test, integration test, and system test phases.
* For the process without reviews, assume that defects are removed only in the compile, unit test, integration test, and system test phases.

Calculate design review time and code review time, based on estimated N&C LOC and the appropriate review rate.

Estimate compile and test times, based on the defects removed per phase and the appropriate defect removal rate.

Ignore time spent in plan, design, code, and postmortem.

Calculate yield%, based on the number of defects injected and removed before the compile phase.

Calculate the expected defects remaining after system test, based on the total number of defects injected and removed through system test.

Your program should round all calculations of the number of defects and of time (in minutes) to an integer value.

Thoroughly test the program. At a minimum, test your program with the following three test cases.

## Test Cases

**Test Case 1:** Use the information in the table below as input.

|  |  |  |  |
| --- | --- | --- | --- |
| Estimated N&C LOC | 200 LOC |  |  |
| Design defect injection rate | 25 defects/KLOC |  |  |
| Code defect injection rate | 80 defects/KLOC |  |  |
| Design review rate | 400 LOC/hr | Design review yield | 60% |
| Code review rate | 200 LOC/hr | Code review yield | 80% |
| Compile defect removal rate | 20 defects/hr | Compile yield | 50% |
| Unit test defect removal rate | 4 defects/hr | Unit test yield | 60% |
| Integration defect removal rate | 0.5 defects/hr | Integration test yield | 50% |
| System test defect removal rate | 0.2 defects/hr | System test yield | 50% |

**Test Case 1, Expected Results:** Your program should produce the results below in any similar format.

|  |  |  |
| --- | --- | --- |
| Phase | Time in Minutes | |
| No Reviews | Reviews |
| Design review | 0 | 30 |
| Code review | 0 | 60 |
| Compile | 33 | 6 |
| Unit test | 90 | 15 |
| Integration test | 240 | 120 |
| System test | 300 | 0 |
| Total | 663 | 231 |
|  |  |  |
| Defects injected |  |  |
| Design | 5 | 5 |
| Code | 16 | 16 |
| Total | 21 | 21 |
|  |  |  |
| **Defects removed** |  |  |
| Design review | 0 | 3 |
| Code review | 0 | 14 |
| Compile | 11 | 2 |
| Unit test | 6 | 1 |
| Integration test | 2 | 1 |
| System test | 1 | 0 |
| Total | 20 | 21 |
|  |  |  |
| Expected number of defects remaining after system test | 1 | 0 |
|  |  |  |
| Yield% | 0 | 81 |

**Test Case 2:** Use the information in the table below as input.

|  |  |  |  |
| --- | --- | --- | --- |
| Estimated N&C LOC | 450 LOC |  |  |
| Design defect injection rate | 30 defects/KLOC |  |  |
| Code defect injection rate | 65 defects/KLOC |  |  |
| Design review rate | 300 LOC/hr | Design review yield | 60% |
| Code review rate | 240 LOC/hr | Code review yield | 75% |
| Compile defect removal rate | 30 defects/hr | Compile yield | 70% |
| Unit test defect removal rate | 6 defects/hr | Unit test yield | 50% |
| Integration defect removal rate | 1 defect/hr | Integration test yield | 50% |
| System test defect removal rate | 0.4 defects/hr | System test yield | 50% |

**Test Case 2, Expected Results:** Your program should produce the results below in any similar format.

|  |  |  |
| --- | --- | --- |
| Phase | Time in Minutes | |
| No Reviews | Reviews |
| Design review | 0 | 90 |
| Code review | 0 | 113 |
| Compile | 60 | 12 |
| Unit test | 70 | 20 |
| Integration test | 180 | 60 |
| System test | 300 | 0 |
| Total | 610 | 295 |
|  |  |  |
| **Defects injected** |  |  |
| Design | 14 | 14 |
| Code | 29 | 29 |
| Total | 43 | 43 |
|  |  |  |
| **Defects removed** |  |  |
| Design review | 0 | 8 |
| Code review | 0 | 26 |
| Compile | 30 | 6 |
| Unit test | 7 | 2 |
| Integration test | 3 | 1 |
| System test | 2 | 0 |
| Total | 42 | 43 |
|  |  |  |
| Expected number of defects remaining after system test | 1 | 0 |
|  |  |  |
| Yield% | 0 | 79 |

**Test Case 3:** Use the information in the table below as input.

|  |  |  |  |
| --- | --- | --- | --- |
| Estimated N&C LOC | 1000 LOC |  |  |
| Design defect injection rate | 30 defects/KLOC |  |  |
| Code defect injection rate | 70 defects/KLOC |  |  |
| Design review rate | 250 LOC/hr | Design review yield | 75% |
| Code review rate | 180 LOC/hr | Code review yield | 75% |
| Compile defect removal rate | 40 defects/hr | Compile yield | 50% |
| Unit test defect removal rate | 5 defects/hr | Unit test yield | 50% |
| Integration defect removal rate | 1 defect/hr | Integration test yield | 50% |
| System test defect removal rate | 0.5 defects/hr | System test yield | 50% |

**Test Case 3, Expected Results:** Your program should produce the results below in any similar format.

|  |  |  |
| --- | --- | --- |
| Phase | Time in Minutes | |
| No Reviews | Reviews |
| Design review | 0 | 240 |
| Code review | 0 | 333 |
| Compile | 75 | 15 |
| Unit test | 300 | 60 |
| Integration test | 780 | 120 |
| System test | 720 | 120 |
| Total | 1875 | 888 |
|  |  |  |
| **Defects injected** |  |  |
| Design | 30 | 30 |
| Code | 70 | 70 |
| Total | 100 | 100 |
|  |  |  |
| **Defects removed** |  |  |
| Design review | 0 | 23 |
| Code review | 0 | 58 |
| Compile | 50 | 10 |
| Unit test | 25 | 5 |
| Integration test | 13 | 2 |
| System test | 6 | 1 |
| Total | 94 | 99 |
|  |  |  |
| Expected number of defects remaining after system test | 6 | 1 |
|  |  |  |
| Yield% | 0 | 81 |

Document Markings

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