**Assignment Kit #9**

**Assignment description**

Construct a checklist to find the defect types that have caused you the most trouble during compile and test. Restrict this initial checklist to a few defect types and use it on the next program. Submit the completed checklist, along with the program and its completed Project Plan Summary form. Also submit a copy of the defect data used to construct the checklist. Use a format similar to that shown in Table 14.6 for analyzing the defect data.

Also read the textbook Chapter 15. There will be a quiz on this material in the next lecture. As part of this quiz, you will be asked to make a defect plan.

Submit copies of those time log pages and Weekly Activity Summaries not previously submitted. Also, turn in completed copies of the Project Plan Summary form, Defect Recording Logs, and the Code Review Checklist for every program you develop. Include both planned and actual development times and actual defects injected and removed. Continue to use PSP and complete and submit PSP Project Plan Summaries and Defect Recording Logs for all programs you write.

**Comments on the assignment**

This assignment gives you initial experience at doing code reviews. The objective is to provide you the data that will show you the effectiveness of reviewing your code before you compile and test it.

**Keep copies of all the forms and data you submit.**

**Table 14.3 Code Review Script**

|  |  |  |
| --- | --- | --- |
|  | Entry criteria | Check that the following are on hand:  - the requirements statement  - the program design  - the program source code  - the coding standards  ***- a copy of the Code Review Checklist*** |
|  | General | ***- Use the Code Review Checklist.***  ***- Follow the checklist instructions during the review.***  ***- At review completion, fill in the To Date and***  ***To Date % columns and the Totals row.*** |
| 1 | Review procedure | - First produce the finished program source code.  - Before compiling or testing the program, print out a source code listing.  - Next, do the code review.  - During the code review, carefully check every line of source code to find and fix as many of the defects as you can. |
| 2 | Fix the defects | - Fix all defects found.  - Check the fixes to ensure they are correct.  - Record the defects in the Defect Recording Log. |
| 3 | Review for coverage | - Verify that the program design fulfills all the functions described in the requirements.  - Verify that the source code implements all the design. |
| 4 | Review the program logic | - Verify that the design logic is correct.  - Verify that the program correctly implements the design logic. |
| 5 | Check names and types | - Verify that all names and types are correctly declared and used.  - Check for proper declaration of integer, long integer, and floating point data types. |
| 6 | Check all variables | - Ensure that every variable is initializes.  - Check for overflow, underflow, or out-of-range problems. |
| 7 | Check program syntax | - Verify that the source code properly follows the language specifications. |
| 8 | Scan program | Do an overall scan of the program to check for system issues and unexpected problems. |
|  | Exit criteria | At completion you must have:  - the completed and corrected source code  - completed Time Recording Log  - completed Defect Recording Log |

**Table 14.4 PSP Process Script**

|  |  |  |
| --- | --- | --- |
|  | Purpose: | To guide you in developing small programs. |
|  | Inputs Required | - The problem description  - PSP Project Plan Summary form  ***- A copy of the Code Review Checklist***  - Actual size and time data for previous programs  - Time Recording Log  - Defect Recording Log |
| 1 | Planning | - Obtain a description of the program functions.  - Estimate the Max., Min., and total LOC required.  - Determine the Minutes/LOC.  - Calculate the Max., Min., and total development times.  - Enter the plan data in the Project Plan Summary form.  - Record the planning time in the Time Recording Log. |
| 2 | Design | - Design the program.  - Record the design in the specified format.  - Record design time in the Time Recording Log. |
| 3 | Code | - Implement the design.  - Use a standard format for entering the code.  - Record coding time in the Time Recording Log. |
| 4 | Code review | - Completely review the source code.  - Follow the code review script ***and checklist.***  - Fix and record every defect found.  - Record review time in the Time Recording Log. |
| 5 | Compile | - Compile the program.  - Fix and record all defects found.  - Record compile time in the Time Recording Log. |
| 6 | Test | - Test the program.  - Fix and record all defects found.  - Record testing time in the Time Recording Log. |
| 7 | Postmortem | - Complete the Project Plan Summary form with actual time, size, and defect data.  ***- Review the defect data and update the code review checklist.***  - Record postmortem time in the Time Recording Log. |
|  | Exit Criteria | - A thoroughly tested program  - A properly documented design  ***- A completed Code Review Checklist***  - A complete program listing  - A completed Project Plan Summary  - Completed time and defect logs |

**Table 13.3 PSP Project Plan Summary**

|  |  |  |  |
| --- | --- | --- | --- |
| Student |  | Date |  |
| Program |  | Program # |  |
| Instructor |  | Language |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Summary** | | | **Plan** | | | |  | **Actual** | | |  | **To Date** | | |
| Minutes/LOC | | |  | | | |  |  | | |  |  | | |
| LOC/Hour | | |  | | | |  |  | | |  |  | | |
| ***Defects/KLOC*** | | |  | | | |  |  | | |  |  | | |
| ***Yield*** | | |  | | | |  |  | | |  |  | | |
| ***A/FR*** | | |  | | | |  |  | | |  |  | | |
| **Program Size (LOC):** | | |  | | | |  |  | | |  |  | | |
| Total New & Changed | | |  | | | |  |  | | |  |  | | |
| Maximum Size | | |  | | | |  |  | | |  |  | | |
| Minimum Size | | |  | | | |  |  | | |  |  | | |
| **Time in Phase (min.)** | | | **Plan** | |  | **Actual** | | |  | **To Date** | | |  | **To Date %** |
| Planning | | |  | |  |  | | |  |  | | |  |  |
| Design | | |  | |  |  | | |  |  | | |  |  |
| Code | | |  | |  |  | | |  |  | | |  |  |
| ***Code Review*** | | |  | |  |  | | |  |  | | |  |  |
| Compile | | |  | |  |  | | |  |  | | |  |  |
| Test | | |  | |  |  | | |  |  | | |  |  |
| Postmortem | | |  | |  |  | | |  |  | | |  |  |
| Total | | |  | |  |  | | |  |  | | |  |  |
| Maximum Time | | |  | |  |  | | |  |  | | |  |  |
| Minimum Time | | |  | |  |  | | |  |  | | |  |  |
| **Defects Injected** | ***Plan*** |  | | **Actual** |  | **To Date** | | |  | **To Date %** | | |  | ***Def./hour*** |
| Planning |  |  | |  |  |  | | |  |  | | |  |  |
| Design |  |  | |  |  |  | | |  |  | | |  |  |
| Code |  |  | |  |  |  | | |  |  | | |  |  |
| ***Code Review*** |  |  | |  |  |  | | |  |  | | |  |  |
| Compile |  |  | |  |  |  | | |  |  | | |  |  |
| Test |  |  | |  |  |  | | |  |  | | |  |  |
| Total |  |  | |  |  |  | | |  |  | | |  |  |
| **Defects Removed** | ***Plan*** |  | | **Actual** |  | **To Date** | | |  | **To Date %** | | |  | ***Def./hour*** |
| Planning |  |  | |  |  |  | | |  |  | | |  |  |
| Design |  |  | |  |  |  | | |  |  | | |  |  |
| Code |  |  | |  |  |  | | |  |  | | |  |  |
| ***Code Review*** |  |  | |  |  |  | | |  |  | | |  |  |
| Compile |  |  | |  |  |  | | |  |  | | |  |  |
| Test |  |  | |  |  |  | | |  |  | | |  |  |
| Total |  |  | |  |  |  | | |  |  | | |  |  |

**Table 13.4 PSP Project Plan Summary Instructions**

|  |  |
| --- | --- |
| Purpose | This form holds the estimated and actual project data in a convenient and readily retrievable form. |
| Header | Enter the following:  - your name and today's date  - the program name and number  - the instructor's name  - the language you will use to write the program |
| Minutes/LOC | Prior to development  - enter the Minutes/LOC planned for this project. Use the To Date rate from the most recent previous program.  After development  - Divide the total development time by the actual program size to get the actual and To Date Minutes/LOC.  - For example, if the project took 196 minutes and you produced 29 LOC, the Minutes/LOC would be 196/29 = 6.76. |
| LOC/Hour | Prior to development  - calculate the LOC per hour planned for this program by dividing 60 by the Plan Minutes/LOC.  After development  - For Actual and To Date LOC/Hour, divide 60 by the Actual and To Date Minutes/LOC.  - For Actual Minutes/LOC of 6.76, Actual LOC/Hour are 60/6.76 = 8.88. |
| Program Size (LOC) | Prior to development, enter under plan:  - the estimated Total, Maximum, and Minimum New & Changed LOC.  After Development:  - Count and enter the Actual New & Changed LOC.  - For To Date, add Actual New & Changed LOC to the To Date New & Changed LOC for the previous program. |

**(Continued)**

**Table 13.4 (Continued)**

|  |  |
| --- | --- |
| Time in Phase - Plan | - For total development time, multiply Total New & Changed LOC by Minutes/LOC.  - For Maximum time, multiply the Maximum size by Minutes/LOC.  - For Minimum time, multiply the Minimum size by Minutes/LOC.  - From the Project Plan Summary for the most recent program, find the To Date % values for each phase.  - Using the To Date % from the previous program, calculate the plan time for each phase. |
| Time in Phase - Actual | - At job completion, enter the actual time in minutes spent in each development phase.  - Get these data from the time log. |
| Time in Phase - To Date | - For each phase, enter the sum of actual time and To Date time from the most recent previous program. |
| Time in Phase - To Date % | - For each phase, enter 100 times the To Date time for that phase divided by the Total To Date time. |
| Defects Injected -  Actual | - After development, find and enter the actual number of defects injected in each phase. |
| Defects Injected - To Date | - For each phase, enter the sum of the actual defects and the To Date defects from the most recent program. |
| Defects Injected - To Date % | - For each phase, enter 100 times the To Date defects for that phase divided by the total To Date defects. |
| Defects Removed - Actual | - After development, find and enter the actual number of defects removed in each phase. |
| Defects Removed - To Date | - For each phase, enter the sum of the actual defects and the To Date defects from the most recent program. |
| Defects Removed - To Date % | - For each phase, enter 100 times the To Date defects for that phase divided by the total To Date defects. |