**Assignment Kit #8**

**Assignment description**

Using the Defect Recording Log in Table 12.2 in the textbook, record every defect you find in the programs you write. Identify the program where the defect was found, list each defect on a separate entry, and completely describe each defect. Summarize the defect data in the Project Plan Summary for each program.

Also, submit a copy of any Time Recording Log and Job Number Log pages and Weekly Activity Summaries that you have not previously submitted and turn in a completed planning form and Defect Recording Log for each newly developed program. Make multiple copies of the Defect Recording Log since you will use it for every program you write for the rest of the course.

Also read the textbook Chapters 13 and 14. There will be a quiz on this material in the next lecture.

**Comments on the assignment**

With this assignment, we start to address the issue of program quality. Your principal objective in addressing program quality is to manage the defects in your programs. To do this, you need to understand those defects. When starting to gather defect data, your initial objective is to obtain data you can later use for defect analysis and planning.

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

**Table 12.1 Defect Type Standard**

**DEFECT TYPES:**

|  |  |  |
| --- | --- | --- |
| Type Number | Type Name | Description |
| 10 | Documentation | comments, messages |
| 20 | Syntax | spelling, punctuation, typos, instruction formats |
| 30 | Build, Package | change management, library, version control |
| 40 | Assignment | declaration, duplicate names, scope, limits |
| 50 | Interface | procedure calls and references, I/O, user formats |
| 60 | Checking | error messages, inadequate checks |
| 70 | Data | structure, content |
| 80 | Function | logic, pointers, loops, recursion, computation, function defects |
| 90 | System | configuration, timing, memory |
| 100 | Environment | design, compile, test, or other support system problems |

**Table 12.2 Defect Recording Log**

**Defect Types**

**10 Documentation 60 Checking**

**20 Syntax 70 Data**

**30 Build, Package 80 Function**

**40 Assignment 90 System**

**50 Interface 100 Environment**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Student | | | |  | | | | | | | | Date | |  | |
| Instructor | | | |  | | | | | | | | Program # | |  | |
| Date |  | Number | | |  | Type |  | Inject |  | Remove |  | | Fix Time |  | Fix Defect |
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| Description: | | |  | | | | | | | | | | | | |
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| Date |  | Number | | |  | Type |  | Inject |  | Remove |  | | Fix Time |  | Fix Defect |
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| Date |  | Number | | |  | Type |  | Inject |  | Remove |  | | Fix Time |  | Fix Defect |
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| Description: | | |  | | | | | | | | | | | | |
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| Date |  | Number | | |  | Type |  | Inject |  | Remove |  | | Fix Time |  | Fix Defect |
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| Date |  | Number | | |  | Type |  | Inject |  | Remove |  | | Fix Time |  | Fix Defect |
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| Description: | | |  | | | | | | | | | | | | |
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| Date |  | Number | | |  | Type |  | Inject |  | Remove |  | | Fix Time |  | Fix Defect |
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| Date |  | Number | | |  | Type |  | Inject |  | Remove |  | | Fix Time |  | Fix Defect |
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**Table 12.3 Defect Recording Log Instructions**

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| --- | --- |
| **Purpose** | This form holds data on each defect as you find and correct it.  Use these data to complete the Project Plan Summary. |
| **General** | Record all review, compile, and test defects in this log.  Record each defect separately and completely.  If you need additional space, use another copy of the form. |
| **Header** | Enter the following:  - your name  - today's date  - the instructor's name  - the number of the program |
| **Date** | Enter the date when the defect was found. |
| **Number** | Number each defect.  For each program, use a sequential number starting with 1 (or 001, etc.). |
| **Type** | Enter the defect type from the defect type list in Table 12.1 (also summarized in the top left corner of the Defect Recording Log).  Use your judgment in selecting which type applies. |
| **Inject** | Enter the phase during which the defect was injected.  Use your judgment. |
| **Remove** | Enter the phase during which the defect was removed.  This would generally be the phase during which you found and fixed the defect. |
| **Fix Time** | Estimate or measure the time required to find and fix the defect.  You can use a stop watch if you wish. |
| **Fix Defect** | You may ignore this entry at this time.  If you injected this defect while fixing another defect, record the number of the improperly fixed defect.  If you cannot identify the defect number, enter an X in the Fix Defect box. |
| **Description** | Write a succinct description of the defect.  Make the description clear enough to later remind you about the error that caused the defect and why you made it. |

**Table 12.5 PSP Process Script**

|  |  |  |
| --- | --- | --- |
|  | Purpose: | To guide you in developing small programs. |
|  | Entry Criteria | - The problem description  - PSP Project Plan Summary form  - 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 | Compile | - Compile the program.  - Fix ***and record*** all defects found.  - Record compile time in the Time Recording Log. |
| 5 | Test | - Test the program.  - Fix ***and record*** all defects found.  - Record testing time in the Time Recording Log. |
| 6 | Postmortem | - Complete the Project Plan Summary form with actual time, size, ***and defect*** data.  - Record postmortem time in the Time Recording Log. |
|  | Exit Criteria | - A thoroughly tested program  - A properly documented design  - A complete program listing  - A completed Project Plan Summary  - Completed time ***and defect*** logs |

**Table 12.6 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 12.7 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 program in the Job Number Log or the most recent Project Plan Summary.  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 12.7 (Continued)**

|  |  |
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| 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.*** |