CIS 285: Software Engineering Tools

University of Michigan – Dearborn

Win 23 Mid-Term Exam

Time: 1 hr. 45 minutes. Total: 100 pts.

Student Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Using the " CircleAreaCalculator.java" file in exam folder to perform the following steps using Git and GitHub:

a. Create a new local repository

b. Add the CircleAreaCalculator.java file to the repository

c. Create a new GitHub repository, e.g., "ExamRepo."

d. Push the local repository to the new GitHub repository.

e. Create a new local branch named "YourBranch."

f. Make changes to the CircleAreaCalculator.java file under the "YourBranch" branch.

g. Compare the difference in file content and then commit the changes.

h. Push the "YourBranch" branch to GitHub.

i. Request to merge the "YourBranch" branch into the main branch.

j. Synchronize the local master with the GitHub repository.

* List all the commands in the process. Your command must follow the same order as the process. 15 pts
* Copy/Paste your github repository url here (Don’t make any change to the github repository after the exam. It is a cheat if you do so) 10 pts

1. A marketing plan software takes salesperson’s target group in terms of income, house value, and zip code, the software search internal patron database and returns all name and address that satisfy requirement. The user can export and print the result list and statistical report of the list.
   1. Determine the number of external inputs, external outputs, external inquires, internal logical files and external interface files. 10 pts
   2. Calculate the number of unadjusted function points for the given software project.(suppose all matrix in (a) are average) 10 pts



Difficulty Values for Function Points

|  |  |  |  |
| --- | --- | --- | --- |
| Information Domain | Simple | Average | Complex |
| External Inputs | 3 | 4 | 6 |
| External Outputs | 4 | 5 | 7 |
| External Inquires | 3 | 4 | 6 |
| Internal Logical Files | 7 | 10 | 15 |
| External Interface Files | 5 | 7 | 10 |

1. Suppose S(Fi) = 50 in question 8. Average productivity for systems of this type is 6.8 FP/pm and burdened labor rate is $7,000 per month.
   1. Calculate function point 5pts
   2. Calculate total project cost in dollar value 5pts
   3. Calculate total estimated effort in pm 5pts
2. Assume you are a software project manager and that you’ve been asked to computer earned value statistics for a small software project. At the time that you’ve been asked to do the earned value analysis, 16 tasks have been completed. However, the project schedule indicates that 18 tasks should have been completed. The following scheduling data (in person-days) are available:
   1. Compute BCWS, ACWP, BCWP 10 pts
   2. Compute the schedule variance, cost variance SPI, CPI, and CSI. 10 pts
   3. What is the project status in terms of schedule and budget. If the project is behind schedule, what are the possible causes that make a project behind schedule. 5 pts

|  |  |  |
| --- | --- | --- |
| Task | Planned Effort | Actual Effort |
| 1 | 13 | 12 |
| 2 | 10 | 11 |
| 3 | 15 | 18 |
| 4 | 7 | 9 |
| 5 | 9.5 | 9 |
| 6 | 18 | 20 |
| 7 | 8 | 11 |
| 8 | 4 | 5 |
| 9 | 12 | 10 |
| 10 | 5 | 3 |
| 11 | 7 | 4 |
| 12 | 14 | 14 |
| 13 | 15 | 18 |
| 14 | 9 | 12 |
| 15 | 8 | 5 |
| 16 | 7 | 8 |
| 17 | 13 |  |
| 18 | 4 |  |

1. Consider the following project activities with their durations in weeks and dependencies:

|  |  |  |
| --- | --- | --- |
| Activity | Duration (weeks) | Predecessors |
| A | 3 | - |
| B | 4 | A |
| C | 2 | A |
| D | 5 | B, C |
| E | 2 | D |
| F | 4 | D |

1. Draw the action on node (AON) network for the above activities. 5 pts
2. List all possible paths and calculate their duration 5 pts
3. Identify the critical path 5 pts