

أفكار المشروع 1 – السنة الثالثة 2017-2018

تعليمات عامة

- تتألف كل مجموعة من 4 إلى 5 طلاب
- تختار كل مجموعة فكرة واحدة من قائمة الأفكار المرفقة حصراً
- تقدم كل مجموعة استثمار مشروع (حسب الاستثمار المرفقة) إلى سكرتاريا قسم هندسة البرمجيات بموعد أقصاه يوم الخميس 15 آذار 2018.
- تقوم رئاسة قسم هندسة البرمجيات بعد تاريخ 15 آذار 2018 بتوزيع المجموعات على المهندسين المشرفين وتشكيل الطلاب الذين لم يتقدموا باستمارة المشروع ضمن مجموعات وإلزامهم بإحدى الأفكار المرفقة وإعلان قوائم المجموعات والأفكار والمشرفين النهائية.
- يجب على جميع الطلاب التقيد بمواعيد الإجتماع مع المشرفين ونصائحهم وتوجيهاتهم، مع العلم أن مسؤولية نجاح المشروع أو فشله تقع بالكامل على عاتق الطلاب.
- يجب على جميع الطلاب التقيد بمراحل التسليم ومواعيده كما سيأتي ضمن الفصل الدراسي.
- إن النجاح في مادة المشروع مرتبط بتحقيق كامل الخدمات الأساسية Core للمشروع المختار من قبل الطلاب أنفسهم.
- يجب على الطلاب تحضير أنفسهم لمقابلات مرحلية تتم قبل أو خلال فترة الامتحانات العملية. بحيث يتم عرض تقني لتنفيذ كامل الخدمات الأساسية Core للمشروع أمام لجنة مختصة ويتم تضمين نتيجة هذا العرض مع النتيجة النهائية للمشروع.

قائمة أفكار المشاريع

- تم وضع رقم معرف ID لكل مشروع للتعبير عنه، كما تم تصنيف المشاريع ضمن عدة مجالات Domain وضمن عدة مستويات من الصعوبة Difficulty حيث يمكن أخذ مستوى الصعوبة بعين الاعتبار أثناء التقييم النهائي للمشروع.
- تم طرح عدة برامج تطبيقية (أمثلة) لكل مشروع. لا يتوجب على الطلاب تكرار تطبيق هذه الأمثلة كما هي، وإنما يتوجب عليهم الإطلاع عليها لفهم خدمات المشروع بشكل أعمق ومقارنة الخدمات المقدمة في مشروعهم نسبة لها.
- تم إدراج توصيف للخدمات الأساسية Core functionality لكل مشروع والتي يتوجب على المجموعة تحقيقها بأنفسهم بشكل كامل بدون الاعتماد على أي بنية أو مكتبة أو تطبيق أو رماز code خارجي جاهز (يجب تحليل Analyse هذه الخدمات بشكل كامل وتحقيقها Implement باستخدام لغة برمجة مناسبة من قبل مجموعة الطلاب أنفسهم، بدون الاعتماد على أي مكتبة أو code جاهز)
- إن الحد الأدنى للنجاح في مادة المشروع 1 هو تحقيق كامل الخدمات الأساسية Core للمشروع من قبل الطلاب بأنفسهم دون استخدام أي بنية أو مكتبة أو تطبيق أو رماز code خارجي جاهز والقدرة على شرحهم هذا التحقيق أثناء المقابلات.
- إن اختيار مجموعة طلاب لفكرة مشروع ثم الفشل في تحقيق كافة خدماته الأساسية بالاعتماد على أنفسهم دون استخدام أي بنية أو مكتبة أو تطبيق أو رماز code خارجي يعرض المجموعة بالكامل لإمكانية الرسوب. لذلك يجب على الطلاب اختيار المشروع بتأن والحرص على اتمام الخدمات الأساسية بالكامل لضمان النجاح.
- إن توزيع الدرجات في المقابلة النهائية مرتبط بالإضافة Extras التي يقدمها الطلاب، حيث يضمن تحقيق الخدمات الأساسية Core علامة النجاح فقط للطلاب. لذلك يمكن للطلاب تحقيق أي خدمات إضافية Extras بعد تحقيق الخدمات الأساسية Core بما يروونه مناسباً ومتناسباً مع المشروع المختار وبعد المناقشة مع المهندس المشرف للحصول على علامة أعلى من علامة الحد الأدنى للنجاح.
- يرتبط توزيع العلامات الإضافية (فوق حد النجاح) بما يلي:
 - عدد الخدمات الإضافية Extras المرتبطة بالمشروع والمطبقة من قبل الطلاب
 - تعقيد الخدمات الإضافية Extras المرتبطة بالمشروع والمطبقة من قبل الطلاب
 - طريقة تطبيق الخدمات الإضافية Extras (بشكل يدوي بالكامل، الاستعانة بمكاتب بسيطة، الاستعانة بمكاتب جاهزة بالكامل،...)
- لا تحتاج أي من الأفكار المرفقة إلى استخدام قواعد البيانات لذلك يجب عدم استخدام أي نوع من أنواع قواعد البيانات، بل يجب الاكتفاء بالتخزين ضمن ملفات عادية في حال الرغبة بتخزين أو استعادة أية بيانات.

Project: Email Client		
ID 101	Domain Internet	Difficulty **
Description An application that manages emails through connections to email servers and user interfaces.		Examples Microsoft Outlook Mozilla Thunderbird
Core Functionality <ul style="list-style-type: none"> •Connect to servers via POP3 and SMTP protocols •Save, retrieve and view emails using the local file system 		Extras (Suggested) <ul style="list-style-type: none"> •Nice, customizable user interface •Web interface •Media management (images, videos, etc...) •Address book

Project: Internet Filter		
ID 102	Domain Internet	Difficulty **
Description A browser-plugin that can be added to a browser in order to block certain domains or websites. An admin password should be used to lock the management dashboard.		Examples Parental Control in Chrome
Core Functionality <ul style="list-style-type: none"> •Monitor requests from the browser and block requests to designated websites •Within-browser admin dashboard where users can manage blocked/allowed websites 		Extras (Suggested) <ul style="list-style-type: none"> •Multiple browser support •Allow both blacklist and whitelist protocols •Support schedules where websites are blocked for certain amounts of time or during certain hours •Support multiple block lists. •Publish the resultant plugin

Project: Internet Downloader		
ID 103	Domain Internet	Difficulty **
Description An application that manages downloads from the internet using HTTP or FTP protocols.		Examples Internet Download Manager
Core Functionality <ul style="list-style-type: none"> •Support http download, pause/resume and internet speed restrictions functionalities. •Support HTTP and FTP downloads. •Support multiple files concurrent download 		Extras (Suggested) <ul style="list-style-type: none"> •Allow multi-part file download •Support priority of downloads. •Support schedules where downloading starts and stops at certain times

Project: FTP Client

ID 104	Domain Internet	Difficulty **
Description An application which can connect to FTP servers in order to upload or download files.		Examples FileZilla CuteFTP
Core Functionality <ul style="list-style-type: none"> •Support ftp secure connection to/from FTP servers •Upload and download files and folders •Support on-server commands (tor, zip, etc...) 		Extras (Suggested) <ul style="list-style-type: none"> •Allow customizable connection options •View/browse server and client •Show upload/download speed •Connect to PuTTY (or a similar telnet client)

Project: Internet Browser

ID 105	Domain Internet	Difficulty ***
Description An application that makes http requests and views the responses as well as loads and views saved HTML files.		Examples Google Chrome Mozilla Firefox
Core Functionality <ul style="list-style-type: none"> •Make http requests and manage responses •Save/Load HTML files •Understand and View HTML content properly 		Extras (Suggested) <ul style="list-style-type: none"> •Support Bookmarks •Support CSS, JS, etc... •Multi-tab functionality •HTML DOM view (Developer view) •Support addons

Project: P2P downloader

ID 106	Domain Internet	Difficulty ***
Description An application that allows file downloads using peer to peer protocols.		Examples uTorrent Bittorrent
Core Functionality <ul style="list-style-type: none"> •Manage information files (.torrent) •Connect to peers and download/upload (leech/seed) parts of files •Support pause/resume and speed restrictions functionalities •Support simultaneous multipart download from multiple peers 		Extras (Suggested) <ul style="list-style-type: none"> •Support priority of downloads. •Support schedules where you download start and stops during certain hours only •Support magnet protocol links, etc...

Project: Network Monitor		
ID 201	Domain Network	Difficulty **
Description An application that monitors network traffic (incoming and outgoing traffic) in real-time and produces reports on that.		Examples Microsoft Message Analyzer
Core Functionality <ul style="list-style-type: none"> • Monitor network packets using one network card. • Support activity aggregation for certain protocols, IPs, sub-networks, etc... • Provide detailed and interactive reports on computer communication. 		Extras (Suggested) <ul style="list-style-type: none"> • Support multiple platforms • Support user daily reports. • Support network event detection and automatic response • Support remote access and management. • Support multiple network cards

Project: Firewall		
ID 202	Domain Network	Difficulty **
Description An application that blocks possibly malicious requests (using ip, domain names or ports)		Examples Kaspersky Internet Security
Core Functionality <ul style="list-style-type: none"> • Monitor network packets coming into the PC using high-level identifiers (urls, names, IPs, ports). • Support suppression for certain protocols, IPs, domains, ports • Provide detailed and interactive reports on filtering and suppression. 		Extras (Suggested) <ul style="list-style-type: none"> • Support multiple platforms • Support user daily reports. • Support network event detection and automatic response • Support remote access and management. • Support blocking by urls

Project: Old-School Instant Messaging and Chat		
ID 203	Domain Network	Difficulty **
Description An application where clients can connect to friends and chat using text, emojis, pictures, etc...		Examples Windows Live Messenger
Core Functionality <ul style="list-style-type: none"> • Support user creation and identification via user name. • Server/Client multi-part system with configuration. • Support instant messaging through text, images and other media. • Support chat history. 		Extras (Suggested) <ul style="list-style-type: none"> • Support multiple platforms (esp. mobile). • Support block list. • Support chat using other chat servers. • Multilingual support • Games and other extensions.

Project: VPN re-route connections		
ID 204	Domain Network	Difficulty ***
Description An application which re-routes network communication from a user's PC if it was its own communication bypassing network restrictions.		Examples Opera VPN Cisco VPN
Core Functionality <ul style="list-style-type: none"> • Server/Client multi-part system with configuration. • Must develop the server application. • Supports adequate re-routing and original client hiding. 		Extras (Suggested) <ul style="list-style-type: none"> • Mimic established VPNs. • Create ad-ons to special browsers. • Support statistics and metering. • VPN server network (multi-instance)

Project: File Explorer		
ID 301	Domain File Systems	Difficulty *
Description An application which allows users to browse computer files with added features.		Examples Windows Explorer
Core Functionality <ul style="list-style-type: none"> • Support file and folder browsing using GUIs. • Static + dynamic menus and options (file type detection, view option, etc...) • Media files preview • Powerful search toolbar • Support copy, cut and past 		Extras (Suggested) <ul style="list-style-type: none"> • Double click management using the environment's applications. • Automatically link to popular applications if found (e.g. winrar). • Support themes.

Project: File Copy Utility		
ID 302	Domain File Systems	Difficulty *
Description An application that can do bulk file copy and backups.		Examples TeraCopy
Core Functionality <ul style="list-style-type: none"> • Supports large file copy especially to backup media (flash drives, hard disks, etc...). • Supports pause/resume and bandwidth restrictions if required. • Supports concurrent multi-file copy • Support backup copy and scheduled jobs. 		Extras (Suggested) <ul style="list-style-type: none"> • Supports copy in the background. • Right-click menu integration. • Nice, customizable GUI.

Project: Disk Analysis Utility		
ID 303	Domain File Systems	Difficulty **
Description An applications which analyses the hard disk usage as well as provide options and reports on hard disk health.		Examples Disk Management
Core Functionality <ul style="list-style-type: none"> • View current usage of disk. • View folder usage of disk. • Provides estimates on how disk space is used (system, applications, media, etc...) • Provide tools to quickly remove temp files and/or schedule temp removing jobs. 		Extras (Suggested) <ul style="list-style-type: none"> • Allow disk rename. • Link to standard tools which clean disks or perform checks and defragmentation. • Customizable disk maintenance jobs. • Support other disk health protocols.

Project: Compression Utility		
ID 304	Domain File Systems	Difficulty **
Description An application which compress files and folders using standard compression algorithms.		Examples WinZip WInRar
Core Functionality <ul style="list-style-type: none"> • Support standard compression and decompression algorithms: zip and tar. • Support compression and decompression of files and folders. • Include GUI. 		Extras (Suggested) <ul style="list-style-type: none"> • Right-click menu integration. • Advanced configurable algorithms for certain types of files. • View compressed folders and choose which files to decompress. • Works with the real applications interchangeably.

Project: End-to-End Secure Transfer Application		
ID 305	Domain File Systems	Difficulty **
Description An application which allows secure file sharing through standard cryptography. Single and dual key cryptography should be supported.		Examples SendSafely
Core Functionality <ul style="list-style-type: none"> • Support encryption/decryption using standard encryption algorithms (AES and RSA) for any file. • Support public/private key generation. • Support a handshaking protocol where the parties exchange a common key for AES-encrypted communication. 		Extras (Suggested) <ul style="list-style-type: none"> • Support public key acquisition via SSH public key. • Support multiple levels of AES • Support text communication as well as file transfer.

Project: PDF Generator		
ID 306	Domain File Systems	Difficulty **
Description An application which reads an input file (text, rtf, html, etc...) and generates a PDF file with the same content.		Examples PDFCreator
Core Functionality <ul style="list-style-type: none"> • Create PDF files from input file. • Support Word, rtf, html, images and similar files. • Support multi-language input files. • View resultant PDF in own viewer. 		Extras (Suggested) <ul style="list-style-type: none"> • Right-click menu integration. • Integrate with Office. • Support different file types.

Project: PDF Editor		
ID 307	Domain File Systems	Difficulty **
Description An application which reads, views, edits and saves pdf files (add comments, add/remove pages, extract pages, ...)		Examples Adobe Acrobat Professional
Core Functionality <ul style="list-style-type: none"> • Load a PDF file into own view to edit. • Support highlighting, commenting, bookmarking, etc... • Save changes and view them later in any PDF reader. 		Extras (Suggested) <ul style="list-style-type: none"> • Support PDF content change. • Support PDF creation as well as updating. • Support optimize PDF file size

Project: Excel Spreadsheet		
ID 308	Domain File Systems	Difficulty ***
Description An application which handles spreadsheets and large tabular datasets.		Examples Microsoft Excel
Core Functionality <ul style="list-style-type: none"> • Save/load and view spreadsheets. • Support mathematical formulae and automatic update. • Support filters and common statistical functions. 		Extras (Suggested) <ul style="list-style-type: none"> • Support xlsx format • Support charts • Support multi-pages • Support rich text • Support paging and printing

Project: Word Writer		
ID 309	Domain File Systems	Difficulty ***
Description An application which handles large texts and prepare them for printing (including texts, images and tables).		Examples Microsoft Word
Core Functionality <ul style="list-style-type: none"> • Save/load and view word documents. • Support rich text as well as images and tables within the text. • Support headings and list of contents 		Extras (Suggested) <ul style="list-style-type: none"> • Support docx format • Support headers/footers • Support printing • Support spelling checks and auto-correct

Project: Versioning Manager		
ID 310	Domain File Systems	Difficulty ***
Description An application that provides version control capabilities, including pulls and pushes, user management, file locking, etc...		Examples TortoiseSVN Git
Core Functionality <ul style="list-style-type: none"> • Client/Server architecture. • The server must maintain latest version as well as changes. Must support “pulls” • Client must “check out” and “push” for file change. 		Extras (Suggested) <ul style="list-style-type: none"> • Support file merger. • Support file differences view. • Right-click menu integration. • Mimic git and git-like applications.

Project: Equation Solver		
ID 401	Domain Multimedia	Difficulty **
Description An application which helps solve all types of mathematical equations as well as show steps and diagrams if need be.		Examples Microsoft Math wolframalpha.com
Core Functionality <ul style="list-style-type: none"> • Analyze input equation. • Support multi-variable equations. • Show steps of solving. • Plot functions using 2D and 3D diagrams. 		Extras (Suggested) <ul style="list-style-type: none"> • Support trigonometric functions. • Support differential equations. • Support common statistical distributions.

Project: Image Editor		
ID 402	Domain Multimedia	Difficulty **
Description An application where users can manipulate images using standard image editing tools.		Examples MS paint Gimp
Core Functionality <ul style="list-style-type: none"> • Read/view/write common picture formats: bmp. • Support common tools (pen, crop, rotation, etc..). • Support common visual filters (saturation, hue, etc..). 		Extras (Suggested) <ul style="list-style-type: none"> • Support all image formats • Support color correction • Support multi-layered files • Support filter • Support printing.

Project: Video Player		
ID 403	Domain Multimedia	Difficulty **
Description An application which can view audio and video files.		Examples Windows Media Player VLC
Core Functionality <ul style="list-style-type: none"> • Read common Audio and Video file formats: wav, mp3 and avi. • Support pause/resume/stop. • Support playlists 		Extras (Suggested) <ul style="list-style-type: none"> • Support mp4 • Change play speed • Support visualization • Support file type conversion

Project: Digital Watermarking software		
ID 404	Domain Multimedia	Difficulty **
Description An application that can add logos and visual signature onto documents, such as images, word files, PDFs, etc...		
Core Functionality <ul style="list-style-type: none"> • Read visual watermark from bmp file. • Attach watermark to at least pictures, word files and PDFs. The application must be able to read and write those types. • A view to customize the watermarking and save. 		Extras (Suggested) <ul style="list-style-type: none"> • Support transparency levels • Nice customizable GUI

Project: Hangman**ID** 501**Domain** Video Games**Difficulty** ***Description**

A party game where one player hides a word and other players try to figure it out one letter at a time

Core Functionality

- Supports single player (vs. computer) and two human player settings.
- Use a dictionary to randomly select words
- Supports difficulty levels.

Extras (Suggested)

- Supports save and load game.
- Support multi-language games.
- Support hints.

Project: Crossword Puzzles**ID** 502**Domain** Video Games**Difficulty** ****Description**

A well-known traditional past-time puzzle where one player tries to figure out encrypted word clues which fit neatly in a grid of letters

Core Functionality

- Use standard game rules.
- Automatically or manually generate grids.
- Use a dictionary to learn words and their meanings.

Extras (Suggested)

- Supports save and load game.
- Support multi-language games.
- Support hints.

Project: Checkers**ID** 503**Domain** Video Games**Difficulty** ****Description**

A board game where two players compete on domination through acquiring the other player's checkers

Core Functionality

- Supports single player (vs. computer) and two human player settings.
- Use standard game rules.
- Supports difficulty levels.

Extras (Suggested)

- Supports save and load game.
- Support hints.
- Support network human players.
- Develop decent computer players.

Project: Go (Chinese Chess)		
ID 504	Domain Video Games	Difficulty **
Description A board game where two players compete on domination through control over sections of the board		
Core Functionality <ul style="list-style-type: none"> • Supports single player (vs. computer) and two human player settings. • Use standard game rules. • Supports difficulty levels. 		Extras (Suggested) <ul style="list-style-type: none"> • Supports save and load game. • Support hints. • Support network games. • Develop decent computer players.

Project: Frogger		
ID 505	Domain Video Games	Difficulty **
Description An arcade game where a frog attempts to cross a hazardous path by jumping on constantly-moving and strategically- positioned objects.		
Core Functionality <ul style="list-style-type: none"> • Use standard game rules. • Use 3D game environments. • Supports difficulty levels and scoreboards. 		Extras (Suggested) <ul style="list-style-type: none"> • Supports save and load game. • Support customizable models. • Support rewards and unlockables.

Project: Galcon		
ID 506	Domain Video Games	Difficulty ***
Description A multiplayer strategy game where players compete on domination through control of power points.		
Core Functionality <ul style="list-style-type: none"> • Use standard game rules. • Supports single player (vs. computer) and multiple human player settings. • Use 2D game environments. • Supports difficulty levels. 		Extras (Suggested) <ul style="list-style-type: none"> • Supports save and load game. • Support customizable models and environments. • Support network games.